

**PERFORMANCE INDICATORS FOR  
OPERATING COMMERCIAL NUCLEAR  
POWER REACTORS**  
Data through June 1989

OFFICE FOR ANALYSIS AND EVALUATION OF OPERATIONAL DATA

**PART I**

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U.S. NUCLEAR REGULATORY COMMISSION



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OPERATING COMMERCIAL NUCLEAR  
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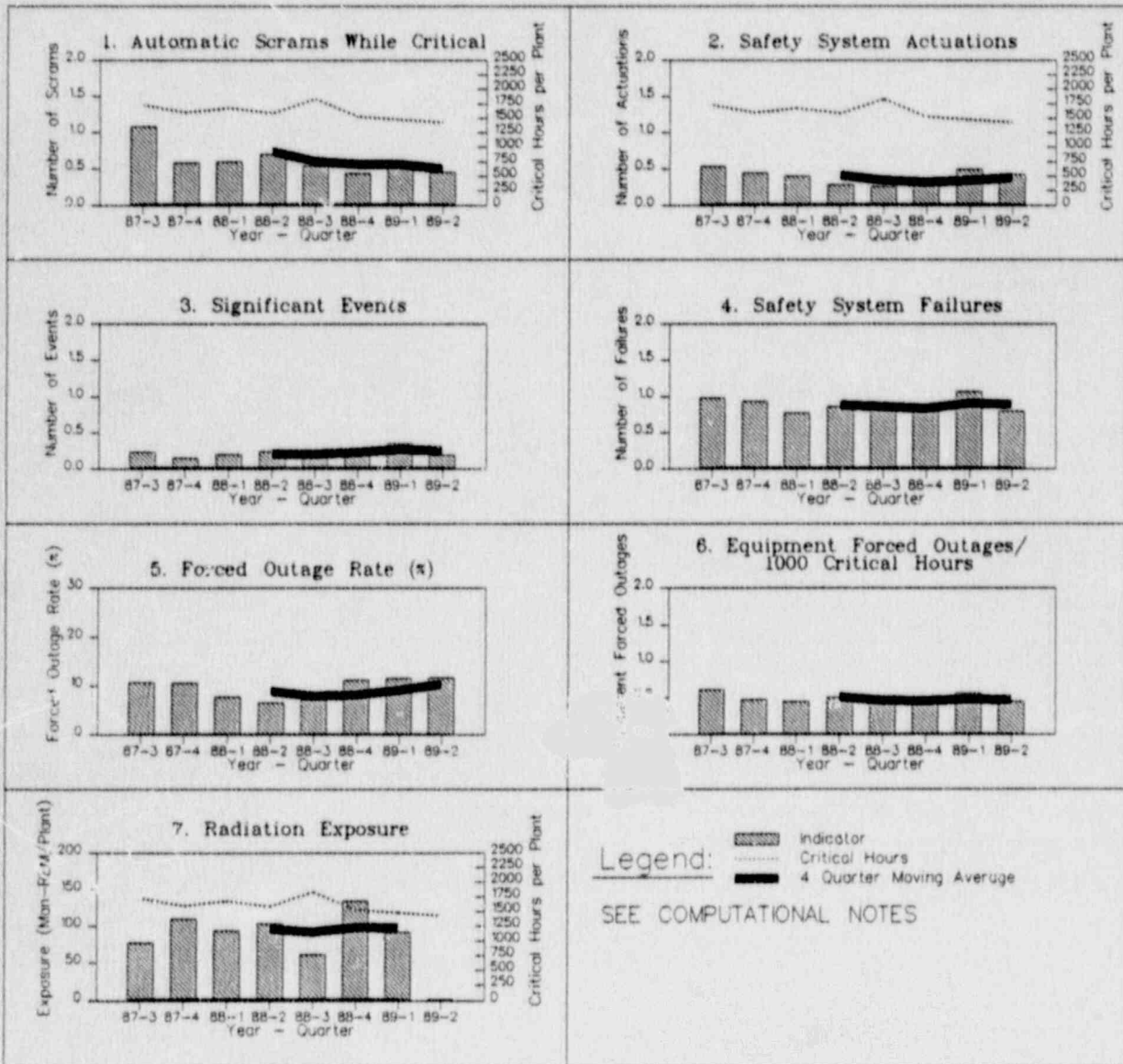
U.S. NUCLEAR REGULATORY COMMISSION

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## PERFORMANCE INDICATOR TRENDS INDUSTRY AVERAGE

This report contains the NRC performance indicators for the second quarter of 1989 (April 1 to June 30, 1989) for commercial power reactors. A summary of the industry averages, with a four quarter moving average trend line, is shown below for seven indicators. Industry wide performance for this quarter of 1989 indicates that the general improvement in yearly trends noted in 1984 through 1988 may be leveling off in 1989. The four quarter moving average for six of the seven indicators has levelled off or increased slightly, although automatic scrams while critical continue to decrease. Year to year trends will be provided in the report for the fourth quarter of 1989.



### Computational Notes on Industry Averages:

Industry averages of the Performance Indicators (PIs) are computed for the nuclear units discussed in this report. All data including industry averages for the last quarter are preliminary, and subject to revision. Such revisions result from the latest monthly operating reports received from the utilities, updates to radiation exposure data, and continuing quality checks on the data.

### Adjustments to Industry Averages

Adjustments are made in the industry averages for plants in extended shutdown. This exclusionary category represents only plants in extended shutdown where Commission approval is required for restart or operation above low power. Adjustments to the PI industry averages for these excluded plants are as follows:

Forced outage rate (FOR) for a plant in extended shutdown or restricted to low power operations for regulatory reasons is not a meaningful indicator. A single plant in forced outage for one quarter would add almost a full percentage point to the industry average FOR for that quarter. Thus, to avoid distorting the industry average FOR, that calculation will exclude the entire period of extended shutdown, including the quarters at the start and end of the extended shutdown.

A number of PI events may be experienced during a restart from an extended outage. These events could be meaningful and should be reflected in industry averages.

A tabular listing of these excluded plants and the calendar quarters for adjusting PI calculations are presented below:

<u>PLANT</u>	<u>EXCLUDED PERIOD FOR FORCED OUTAGE RATE</u>	<u>EXCLUDED PERIOD FOR OTHER PIs</u>
Browns Ferry 1	Entire Period	Entire Period
Browns Ferry 2	Entire Period	Entire Period
Browns Ferry 3	Entire Period	Entire Period
Peach Bottom 2	Entire Period	* to 89-1
Peach Bottom 3	Entire Period	Entire Period
Pilgrim	* to 88-4	* to 88-4
Rancho Seco	* to 88-1	* to 88-1
Seabrook	Entire Period	* to 89-1
Sequoyah 1	* to 88-4	* to 88-3
Sequoyah 2	* to 88-2	* to 88-1
Shoreham	Entire Period	Entire Period

Radiation exposure can be significant during outages, hence the industry average for collective radiation exposure does include periods where a plant is in an extended shutdown.

\* Extended shutdown began prior to 87-3

### Performance Indicator Definitions (See Part II for the detailed definitions)

#### AUTOMATIC SCRAMS WHILE CRITICAL

The number of unplanned automatic reactor scrams while the reactor is critical.

#### SAFETY SYSTEM ACTUATIONS

The number of engineered safety feature actuations involving either Emergency Core Cooling Systems (ECCS) or Emergency AC power systems (Diesel Generators).

#### SIGNIFICANT EVENTS

Events identified by the NRC as being significant as a result of detailed screening.

#### SAFETY SYSTEM FAILURES

Event or condition that could prevent the fulfillment of the safety function of any of 24 systems and subsystems reported pursuant to 10CFR50.73.

#### FORCED OUTAGE RATE

The number of forced outage hours divided by the sum of the forced outage hours and the generator on-line hours. Beginning with the June 1989 report the industry average forced outage rate is higher in this report than the values reflected in earlier reports, primarily due to a reclassification of an extended scheduled outage by the Nine Mile Point Unit 1 licensee (by letter dated March 14, 1989). Beginning with this report, the computation of industry average forced outage rate conforms to NUREG-0020 in reflecting an initial commercial operation date for Clinton Unit 1 of November 24, 1987.

#### EQUIPMENT FORCED OUTAGES per 1000 CRITICAL HOURS

The average number of equipment forced outages experienced per 1000 hours of critical operation. Beginning with the June 1989 report, the industry average for equipment forced outages per thousand critical hours, is the total number of equipment forced outages divided by the total number of critical hours for the industry. The industry average equipment forced outage per thousand critical hours is somewhat lower than the comparable periods in the AEOD Annual Report, and the 1988 PI reports due to these computational changes. The initial commercial operation date for Clinton Unit 1 is November 24, 1987.

#### COLLECTIVE RADIATION EXPOSURE

The total dose at the station. This data is provided by INPO. The station dose is divided by the number of units at the site contributing to dose to obtain unit values.



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

**ANNOUNCEMENT NO. 30**

**DATE: February 5, 1988**

**TO: ALL NRC EMPLOYEES**

**SUBJECT: GUIDANCE ON THE USE OF PERFORMANCE INDICATORS**

The Commission has approved the internal guidance for the use of performance indicators for operating power plants. All NRC employees shall adhere to the following guidance.


The performance indicator program provides an additional view of operational performance and enhances our ability to recognize areas of poor and/or declining safety performance of operating plants. However, it is only a tool and is to be used in conjunction with other tools such as the results of routine and special inspections and SALP for providing input to NRC management decisions regarding the need to adjust plant-specific regulatory programs.

It should be recognized that performance indicators have limitations and are subject to misinterpretation. Therefore, caution is warranted in the interpretation and use of the data. The application of performance indicators for purposes and in manners other than those stated above will be counter to the NRC objective of ensuring operational safety. To avoid such situations, the following specific directives are provided:

1. The performance indicator program for operating reactors is a single, coordinated, overall NRC program under the direction of AEOD. NRC offices other than AEOD should not deviate from the NRC program without written permission of the EDO or the Director, AEOD.
2. Performance indicators are intended as a tool for senior NRC management to monitor trends in overall performance for a given plant. The performance indicators for a given plant should be viewed as a set. When viewed as a set, the performance indicators provide an additional measure of plant operational performance.

3. Performance indicators are intended to be one of several tools for use by senior NRC management in decision making regarding plant specific regulatory programs. Senior management in each NRC office should have access to performance indicators for their assigned unit(s). However, no regulatory action should be taken on the basis of performance indicator program results alone.
4. Performance indicators should not be used for ranking nuclear power plants or presented in such a way as to imply "problem facility" status for individual plants.
5. The performance indicator program is separate and distinct from the Systematic Assessment of Licensee Performance (SALP) Program. Although the indicators have relationships in varying degrees to SALP functional areas, the indicators themselves should not be a factor in judgements about the effectiveness or rating in a particular SALP functional area. In particular, it would be inappropriate to make reference to performance indicator program results in arriving at a SALP rating.
6. NRC senior management should bear in mind when evaluating performance indicator results that the indicators are assessment tools that aid in identification of unanticipated performance, and that the underlying causes should be carefully assessed, evaluated, and understood (factoring in other available information).
7. Quarterly compilations of performance indicator program results should be placed in the Public Document Room following dissemination to NRC management and the Commission.

It should be recognized that in conducting reviews, inspections and evaluations of plants it is often necessary to rely on plant data. Such information has been routinely used in our SALP, SER and Technical Evaluation reports. The forgoing policy is not intended to change this process.

  
Victor Stelle, Jr.  
Executive Director  
for Operations

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# ANALYSIS OF THE PERFORMANCE INDICATOR DATA THROUGH JUNE 1989

## 1. INTRODUCTION

This U.S. Nuclear Regulatory Commission (NRC) report presents performance indicator data through June 1989 for 113 operating reactors. There are eight indicators in the NRC Performance Indicator Program for Operating Commercial Nuclear Power Plants: (1) automatic scrams while critical, (2) safety system actuations, (3) significant events, (4) safety system failures, (5) forced outage rate, (6) equipment forced outages/1000 critical hours, (7) collective radiation exposure, and (8) cause code trends.

The performance indicator data are extracted from licensee event reports submitted in accordance with 10 CFR 50.73, immediate notifications to the NRC Operations Center in accordance with 10 CFR 50.72, and monthly operating reports in accordance with plant technical specifications. Radiation exposure data is obtained from INPO. The charts for each plant are provided in Part I of the report, and the tables are provided in Part II.

Beginning with this report, cause code trends are provided for each plant.

## 2. BACKGROUND

Since May 1986, an interoffice task group has been working to develop an overall NRC program for using quantitative indicators of nuclear power plant safety performance. In July and August of 1986, the group conducted a trial program for 50 plants with 17 prospective performance indicators. For the most part, this trial program used data through calendar year 1984. The group then selected eight performance indicators to be recommended as the best set for initial implementation. One of these, corrective maintenance backlog, was deleted by the staff following consideration of industry comments.

In October 1986, a prototype report was prepared by expanding the trial program data to 100 operating reactors and including the data through the first half of 1986. The staff's recommended program, the task group report, and the prototype report were documented in SECY-86-317, Performance Indicators, dated October 28, 1986. The Commission was briefed on the staff's recommended program in November 1986, and approved the implementation of the program in December 1986, instructing the staff to delete the enforcement action index from the set of indicators. The Staff proposal for use of cause codes as a performance indicator were documented in SECY-89-046 and SECY-89-211. Through Staff Requirements Memoranda (SRM) dated March 15, 1989 and August 10, 1989, the Commission approved cause trends as a new performance indicator.

Since February 1987, the performance indicator reports have been provided to the senior management on a quarterly basis. Since September 1989, the Performance Indicator report has included cause code trends. The September 1989 issue of the quarterly report contains data through June 1989.

### **3. DEFINITIONS OF INDICATORS**

The performance indicator data presented in this report are categorized utilizing specific definitions. Summary definitions for each category are provided in the following sections. Detailed definitions are contained in Part II of this report.

#### **3.1 AUTOMATIC SCRAMS WHILE CRITICAL (SCRAMS)**

This PI is identical to another indicator, unplanned automatic scrams while critical, used by the Institute of Nuclear Power Operations (INPO). In addition, the number of automatic scrams from above 15% power per 1000 critical hours and the number of automatic scrams while critical below 15% power are monitored.

#### **3.2 SAFETY SYSTEM ACTUATIONS (SSA)**

This PI is identical to another indicator, unplanned safety system actuations, used by INPO and includes actual and inadvertent actuations of Emergency Core Cooling Systems (ECCS), as well as actuations of emergency AC power systems due to loss of power to a vital bus.

#### **3.3 SIGNIFICANT EVENTS (SE)**

These events are identified by the detailed screening of operating experience by the Office of Nuclear Reactor Regulation (NRR) and the Office for Analysis and Evaluation of Operational Data (AEOD). The events include degradation of important safety equipment, unexpected plant response to a transient, a major transient, discovery of a major condition not considered in the plant safety analysis, and degradation of fuel integrity, primary coolant pressure boundary, or important associated structures.

#### **3.4 SAFETY SYSTEM FAILURES (SSF)**

This indicator includes any event or condition that could prevent the fulfillment of the safety function of structures or systems. Twenty-four systems or subsystems are monitored for this indicator.

### **3.5 FORCED OUTAGE RATE (FOR)**

This indicator's definition is identical to the one used by INPO and the NRC Gray Book (NUREG-0020). It is the number of forced outage hours divided by the sum of forced outage hours and generator on-line hours. This indicator is used only for plants that are in commercial operation.

### **3.6 EQUIPMENT FORCED OUTAGES PER 1000 CRITICAL HOURS (EFO)**

This PI is the inverse of the mean time between forced outages caused by equipment failures. The mean time is equal to the number of hours the reactor is critical in a period divided by the number of forced outages caused by equipment failures in that period. This indicator is used only for plants that are in commercial operation.

### **3.7 COLLECTIVE RADIATION EXPOSURE**

This indicator is identical to the one used by INPO. It is the total dose accumulated by the station personnel. The station total is divided by the number of units at the site contributing to exposure to obtain unit values.

### **3.8 CAUSE CODE TRENDS**

The cause code indicator captures the plant's trends for licensed operator errors, other personnel errors, equipment failures (electronic piece-part or environmental-related failures), design/construction/installation/fabrication problems, administrative control problems, and maintenance problems. Maintenance problems are divided into subcategories of maintenance personnel error, test or calibration personnel error, maintenance equipment failure, and potential maintenance problems.

### **3.9 ADDITIONAL NOTES**

Part II of this report provides one-line descriptions of each performance indicator event for the third and fourth quarters 1988, and first and second quarters 1989. Part II also provides a tabular listing of PIs, cause codes and critical hours by quarter for each plant. In addition, an overall industry summary table provides the moving average for the most recent two quarters (two-quarter period) and the moving average for the four quarters that precede the two-quarter period (prior four-quarter period) for each performance indicator (except collective radiation exposure) for each plant.

The data for this report were obtained from NRC sources and were reviewed by NRC personnel in Headquarters and the Regions for completeness and accuracy. Data on collective radiation exposure was obtained from INPO. Data for the most recent quarter, along with the other data, will be reviewed again in preparation for the next quarterly report, to ensure that late information, if any, is taken into account.

## 4. DISPLAY OF PERFORMANCE INDICATOR DATA

The performance indicator data are presented in this report on charts and tables as discussed in the following sections.

### 4.1 QUARTERLY DATA

Figures 4.1 through 4.113 provide detailed plant analysis charts of the quarterly data for each indicator for each plant. These charts also include the plant's critical hours to present a picture of the plant's operating history, industry mean values<sup>1</sup> to provide a comparative performance level, and the four-quarter moving averages to show trends. Bar charts of older plants include the older plant mean values; charts for newer plants<sup>2</sup> include both the newer plant and the older plant mean values. These charts give detailed illustrations of the indicator data at given plants. In addition, a cause code trend window provides a graphical depiction of the trends in the four quarter moving averages of the cause codes for each plant.

### 4.2 PLANT SUMMARIES

Figures 4.1 through 4.113 consist of two (or three for newer plants) bar charts that provide profiles of each plant's performance indicator trends and the corresponding performance indicator values.<sup>3</sup> The left chart of each figure shows the number of standard deviations by which the moving average for the most recent two-quarter period varies from the plant's own moving average for the prior four-quarter period. The right chart of each figure shows the number of standard deviations by which the plant's moving average for the most recent four quarters (current four-quarter period) varies from an industry mean. Older plants are compared to the older plants. Newer plants are compared to the newer plants. The figures for newer plants also have a chart display that compares the plants' moving averages for the current four-quarter period to the older plant mean values.

- 
1. Industry mean values for safety system failures and collective radiation exposure are computed separately for boiling water reactors and pressurized water reactors. The industry average for Ft. St. Vrain includes all older plants.
  2. New plants are plants within the first full calendar year of operation after full power operating license issuance.
  3. For cause codes, Figures 4.1 through 4.113 reflect trends only.



### 4.3 PLANT SUMMARIES AND QUARTERLY DATA FIGURES

FIGURE 4.1

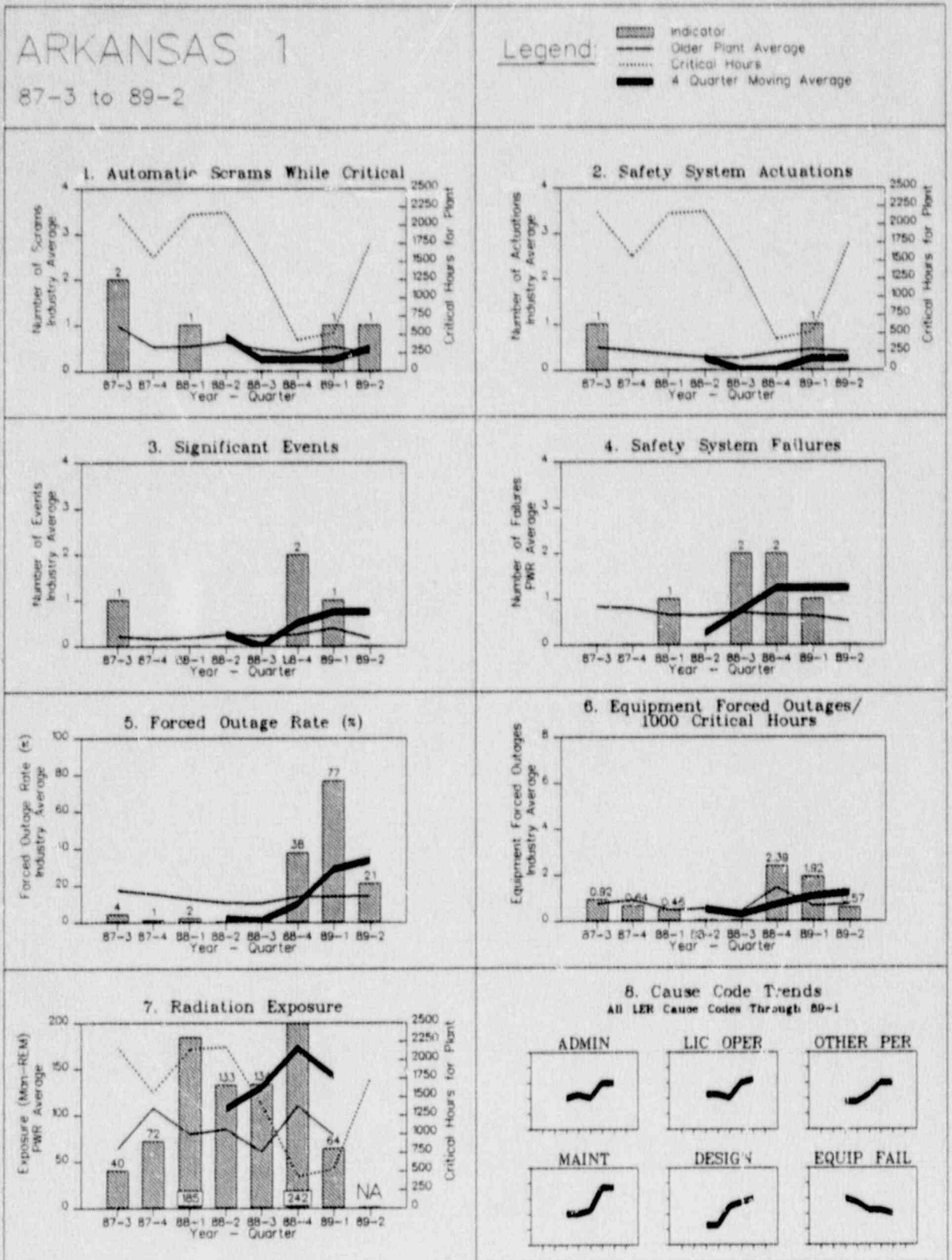
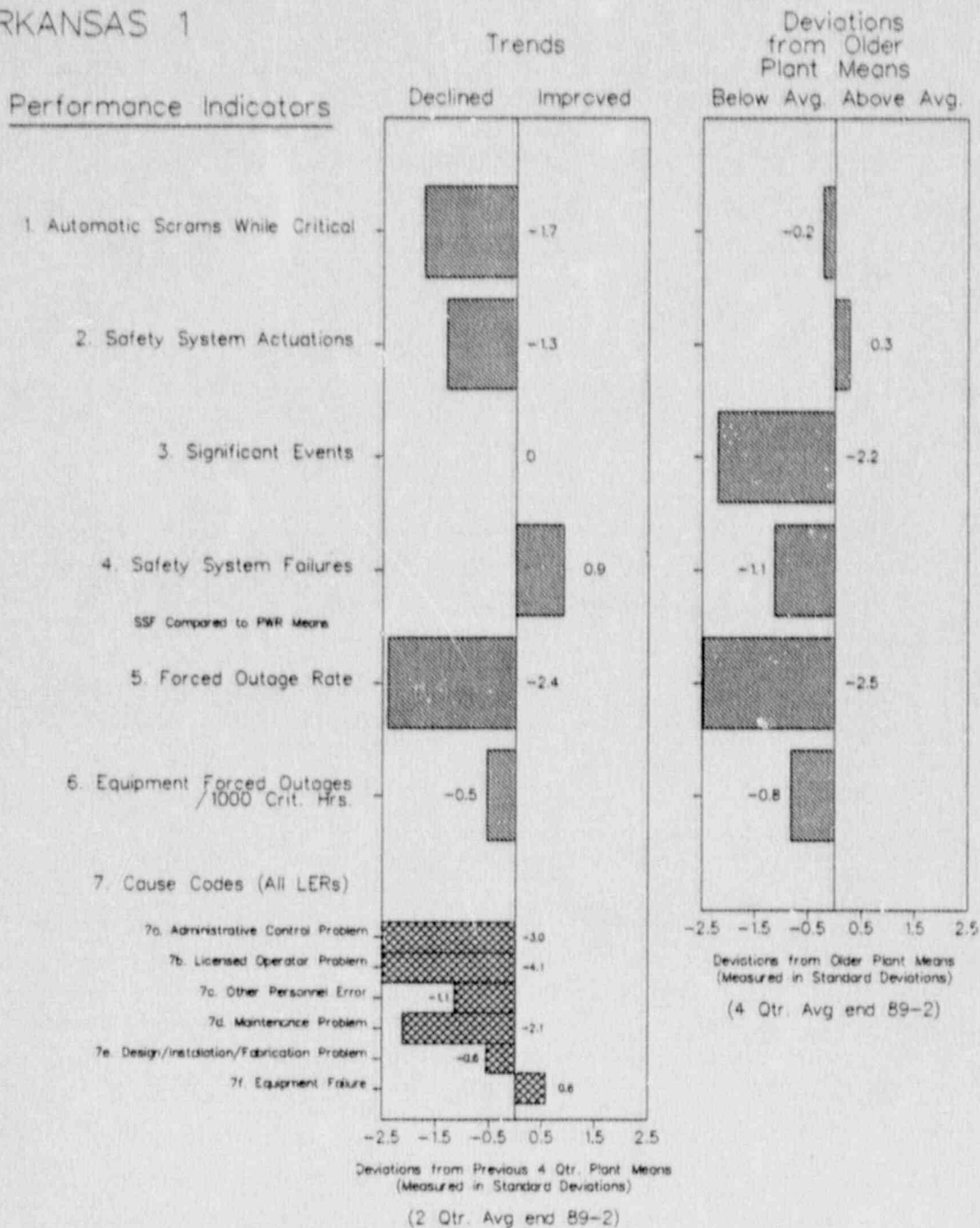


FIGURE 4.1

ARKANSAS 1



\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.2

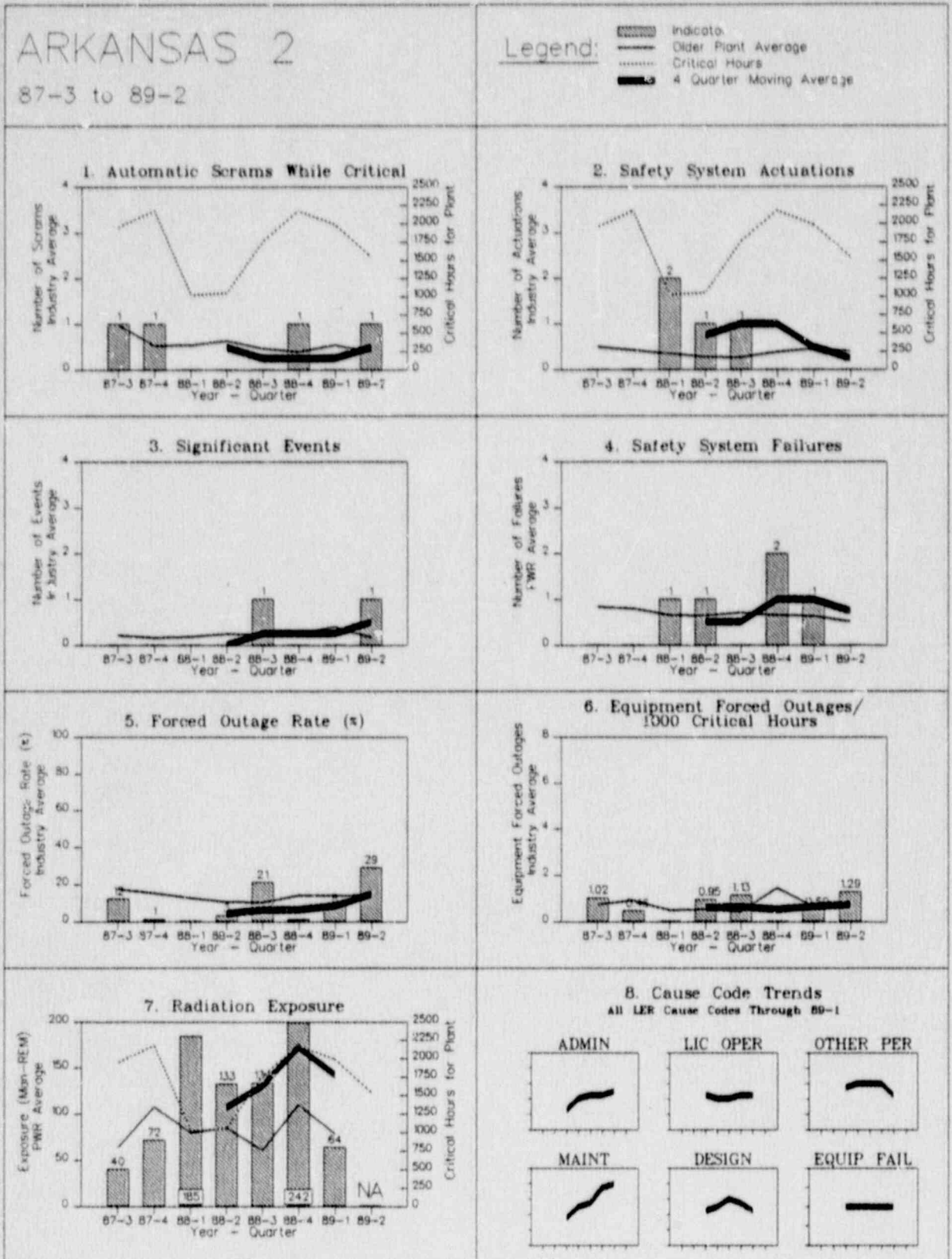


FIGURE 4.2

ARKANSAS 2

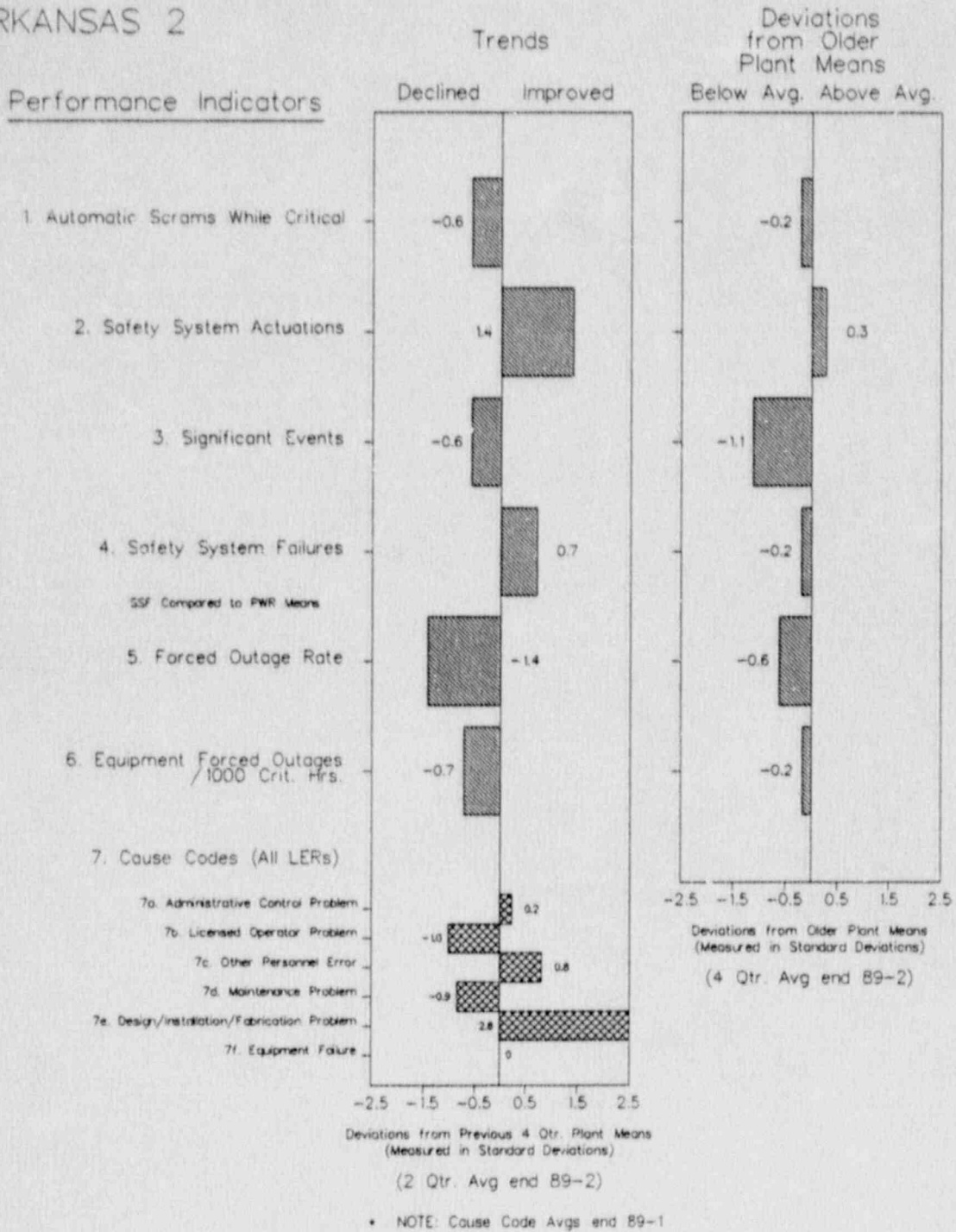


FIGURE 4.3

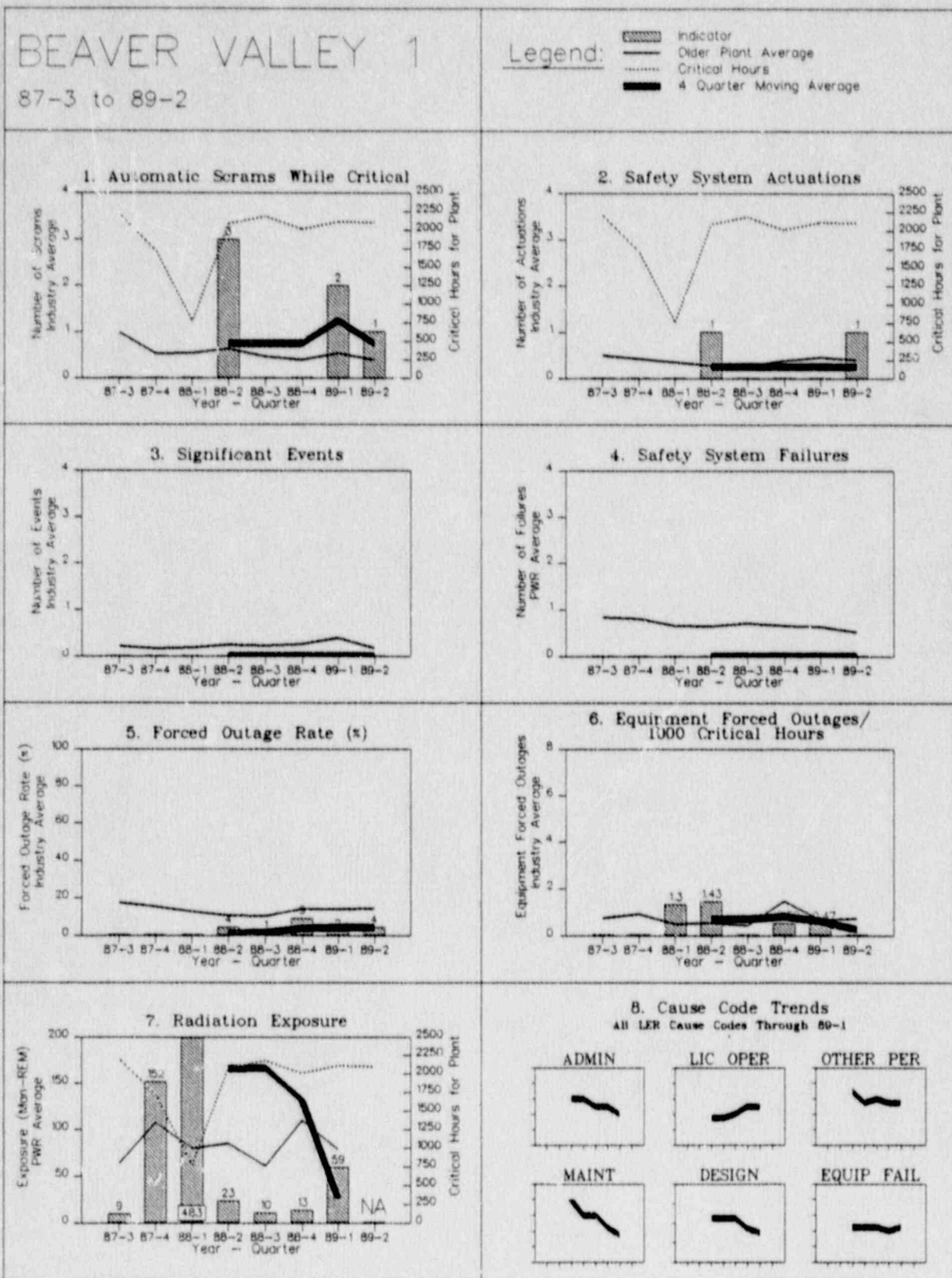
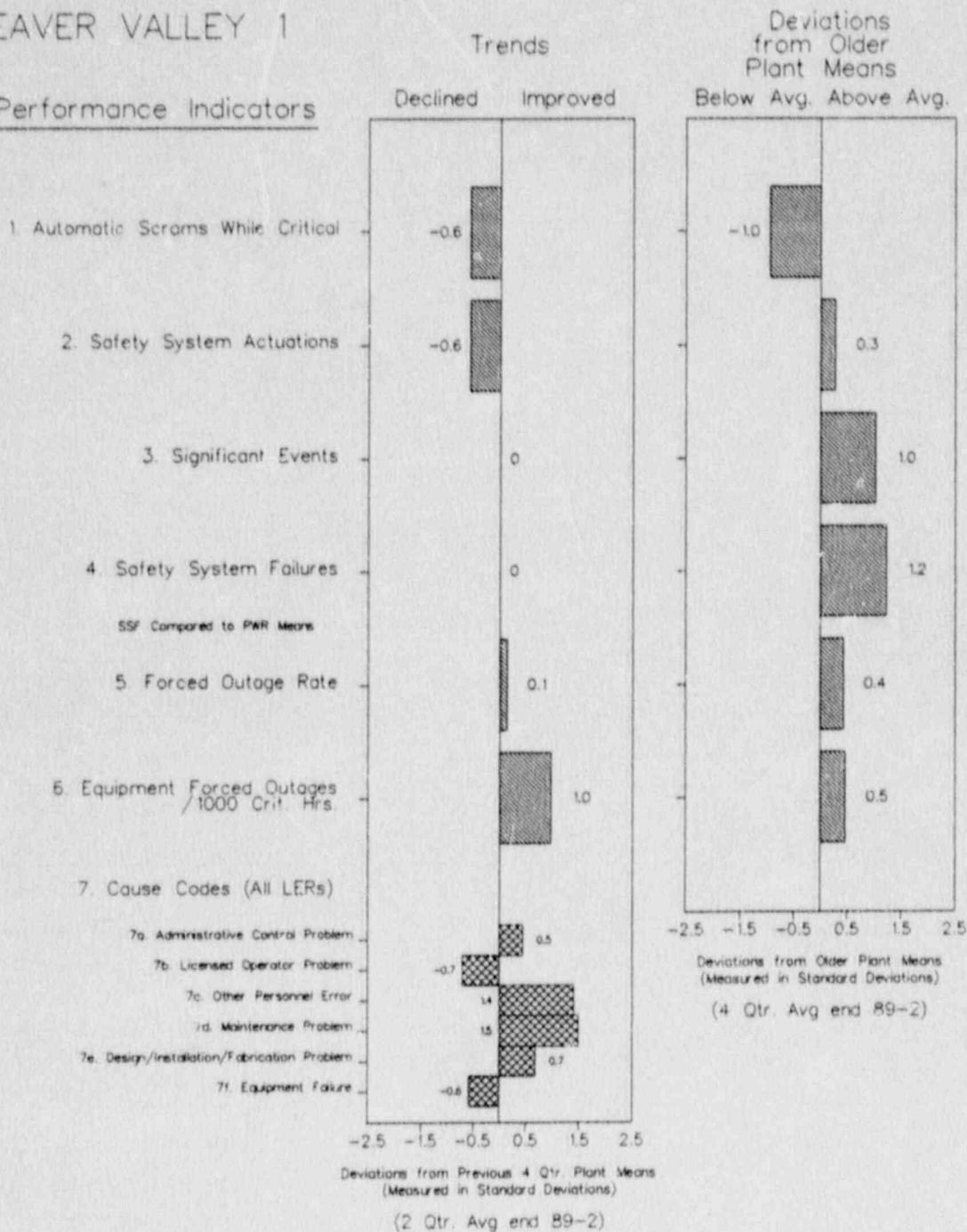


FIGURE 4.3

# BEAVER VALLEY 1

## Performance Indicators



\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.4

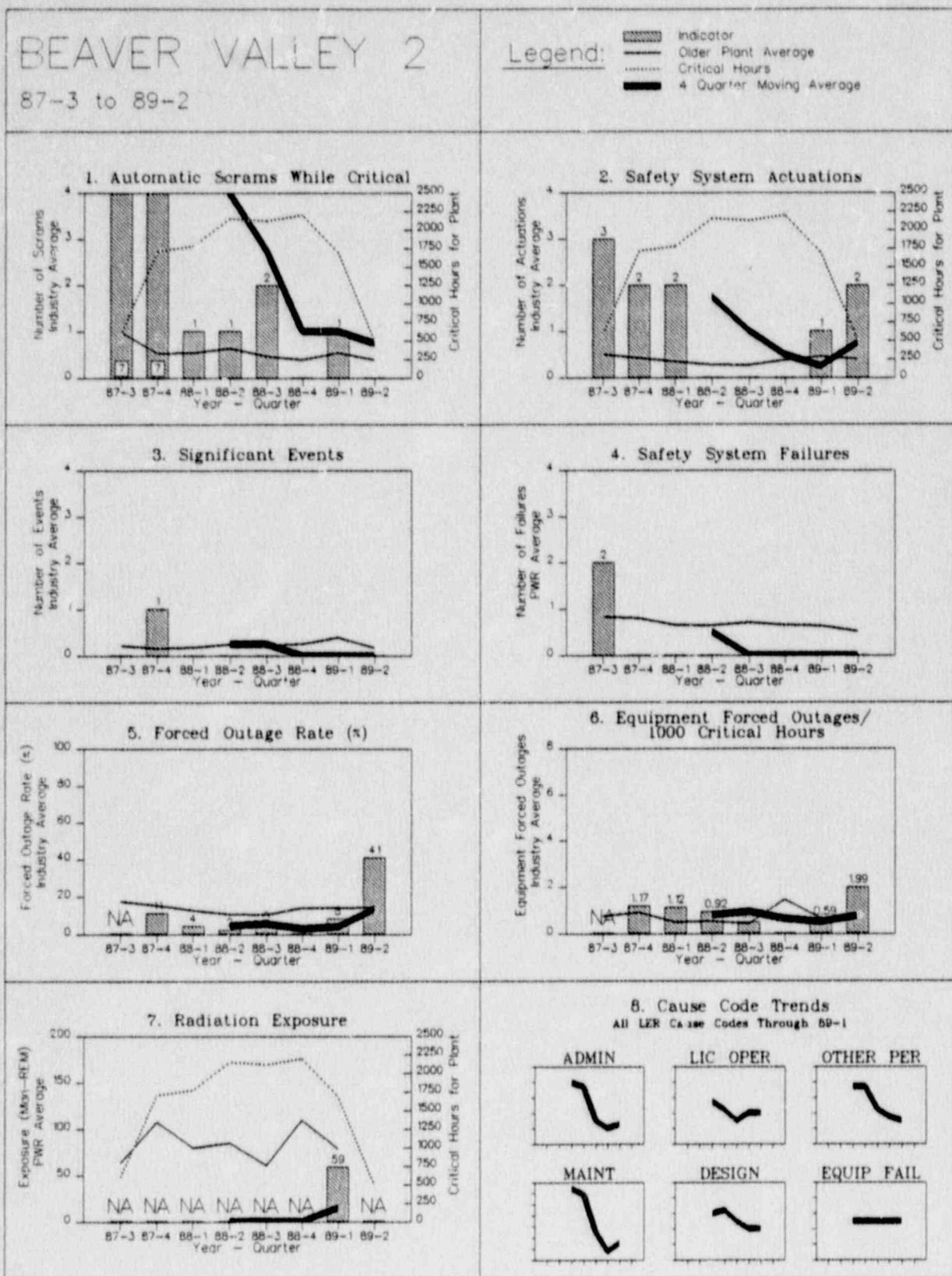
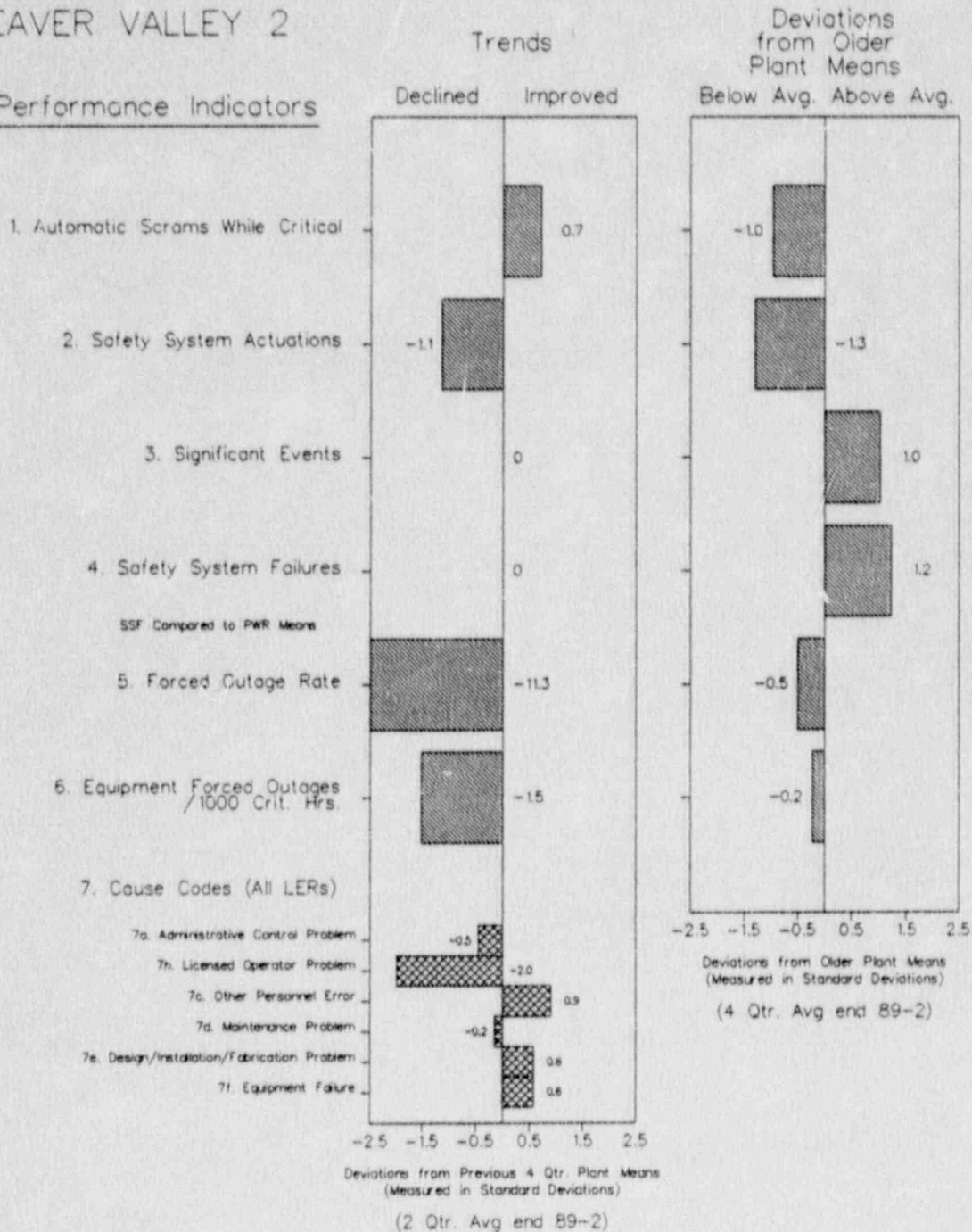




FIGURE 4.4

BEAVER VALLEY 2

Performance Indicators



• NOTE: Cause Code Avgs end 89-1

FIGURE 4.5

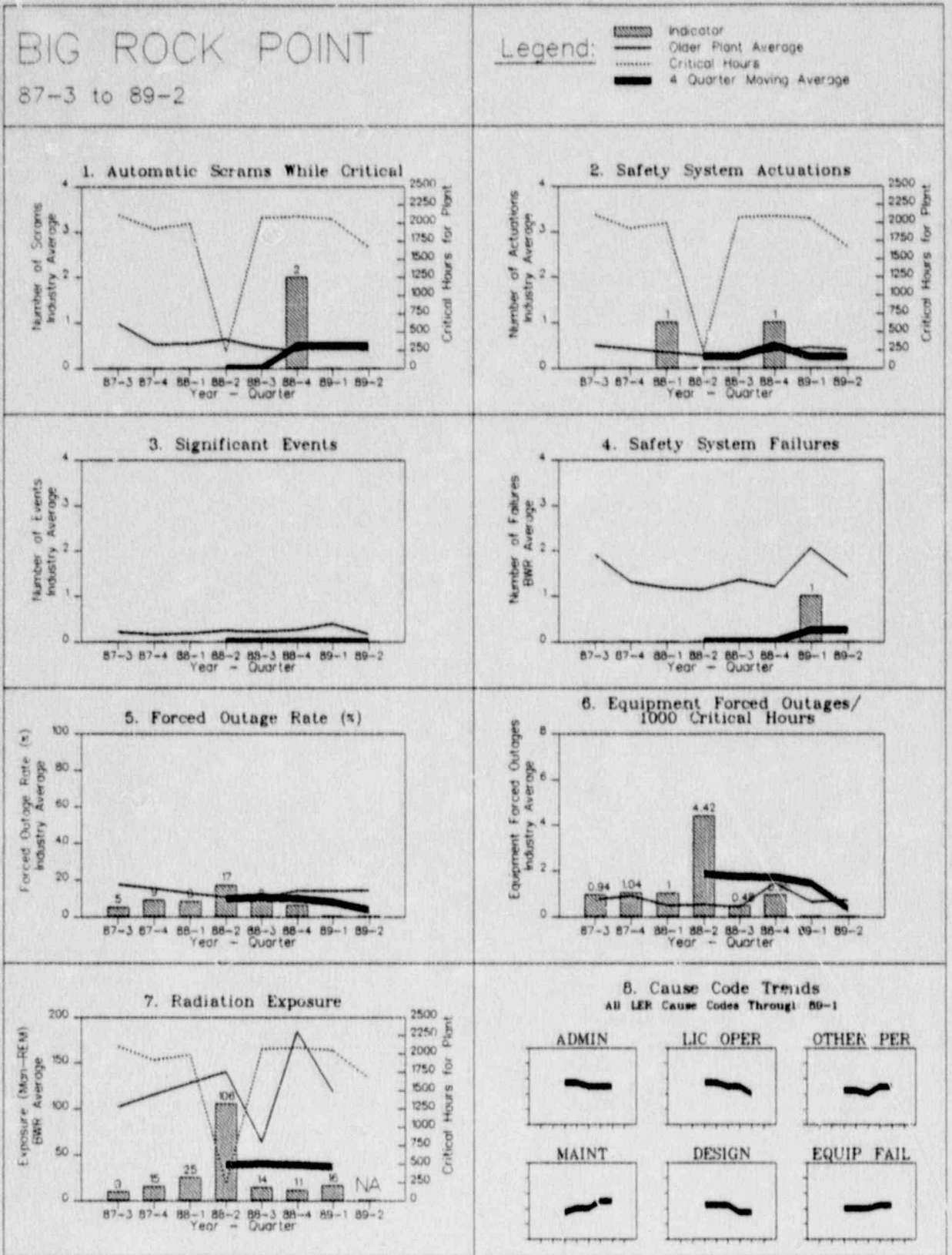
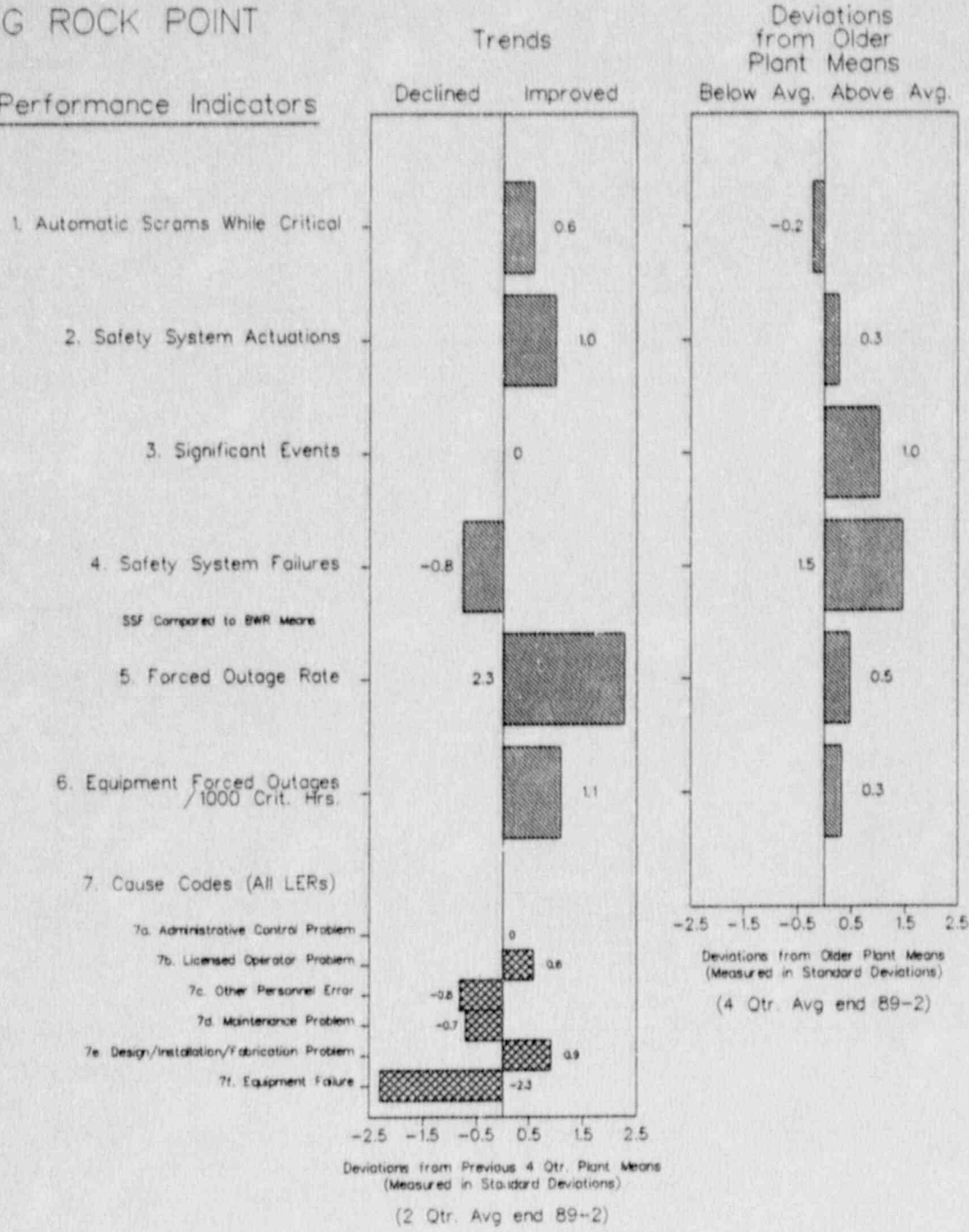


FIGURE 4.5

# BIG ROCK POINT

## Performance Indicators



• NOTE: Cause Code Avgs end 89-1

FIGURE 4.6

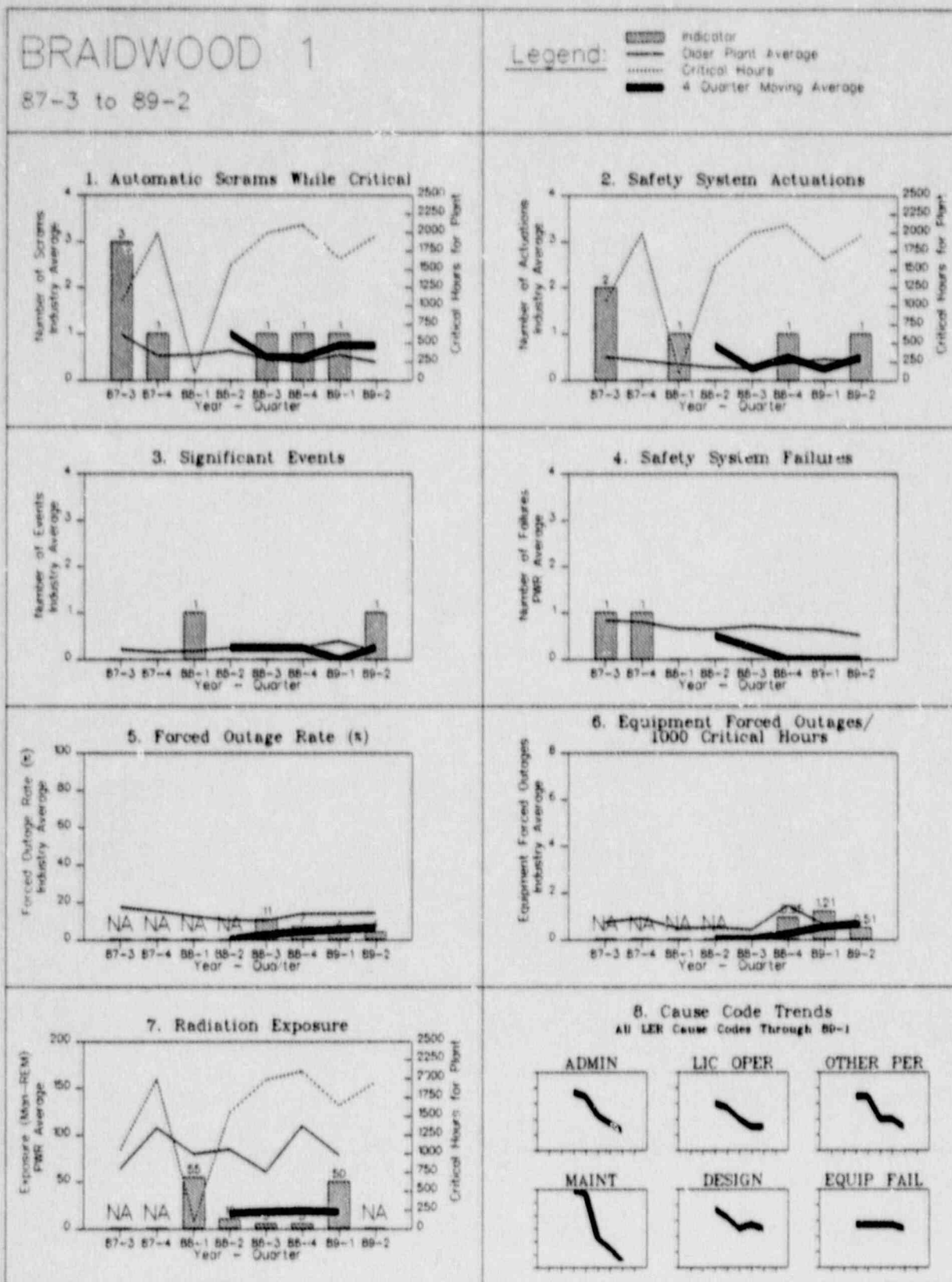


FIGURE 4.6

BRAIDWOOD 1

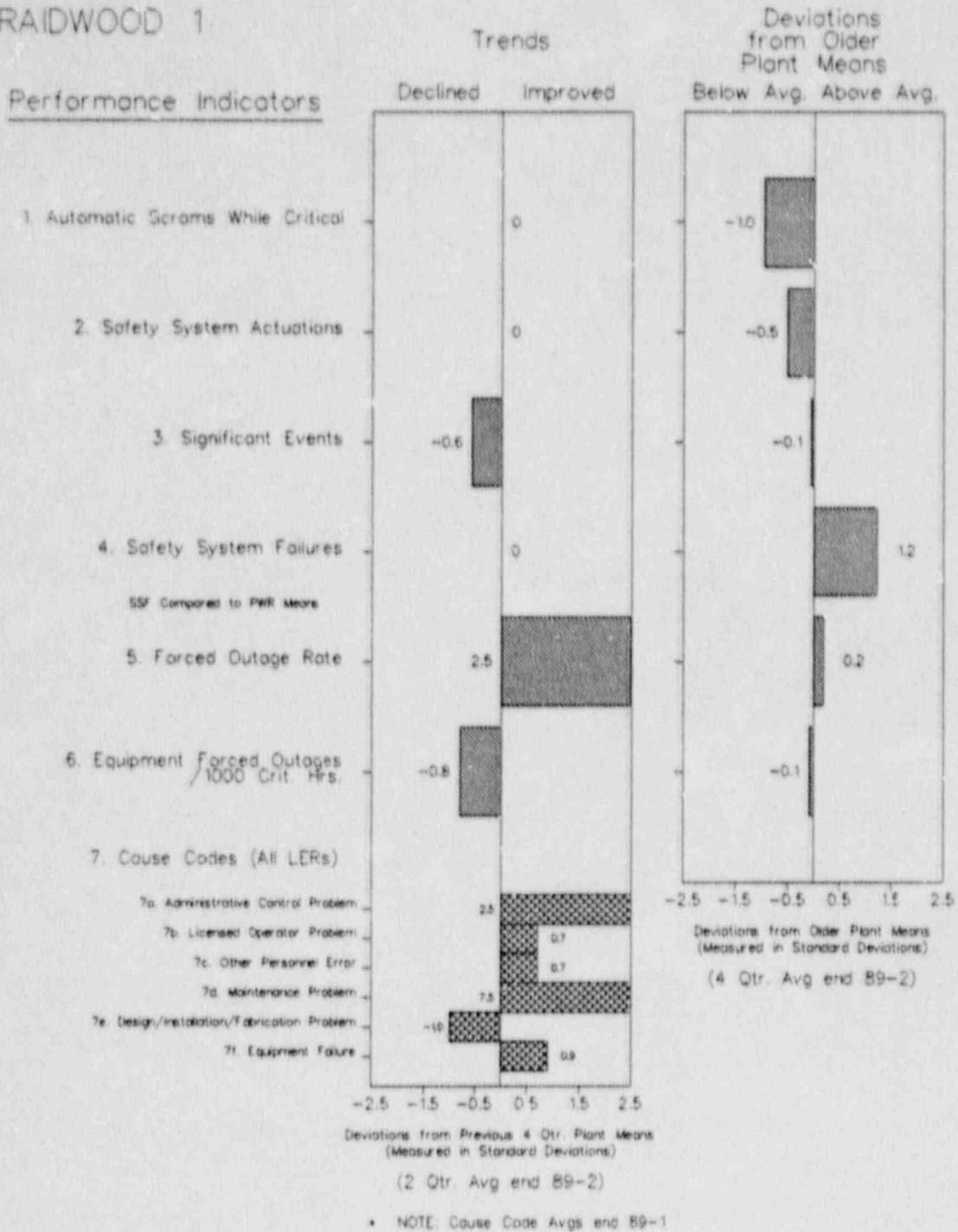


FIGURE 4.7

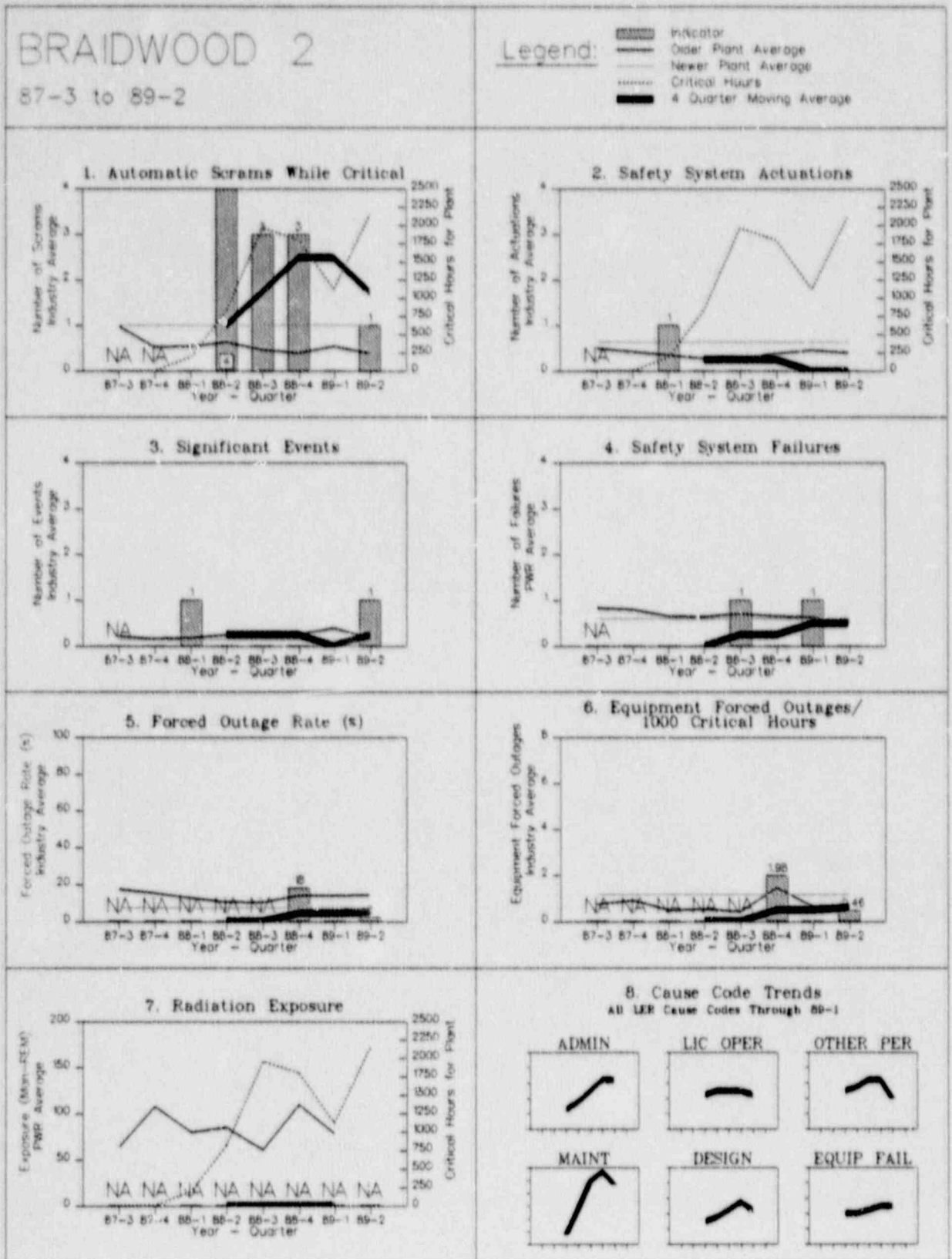
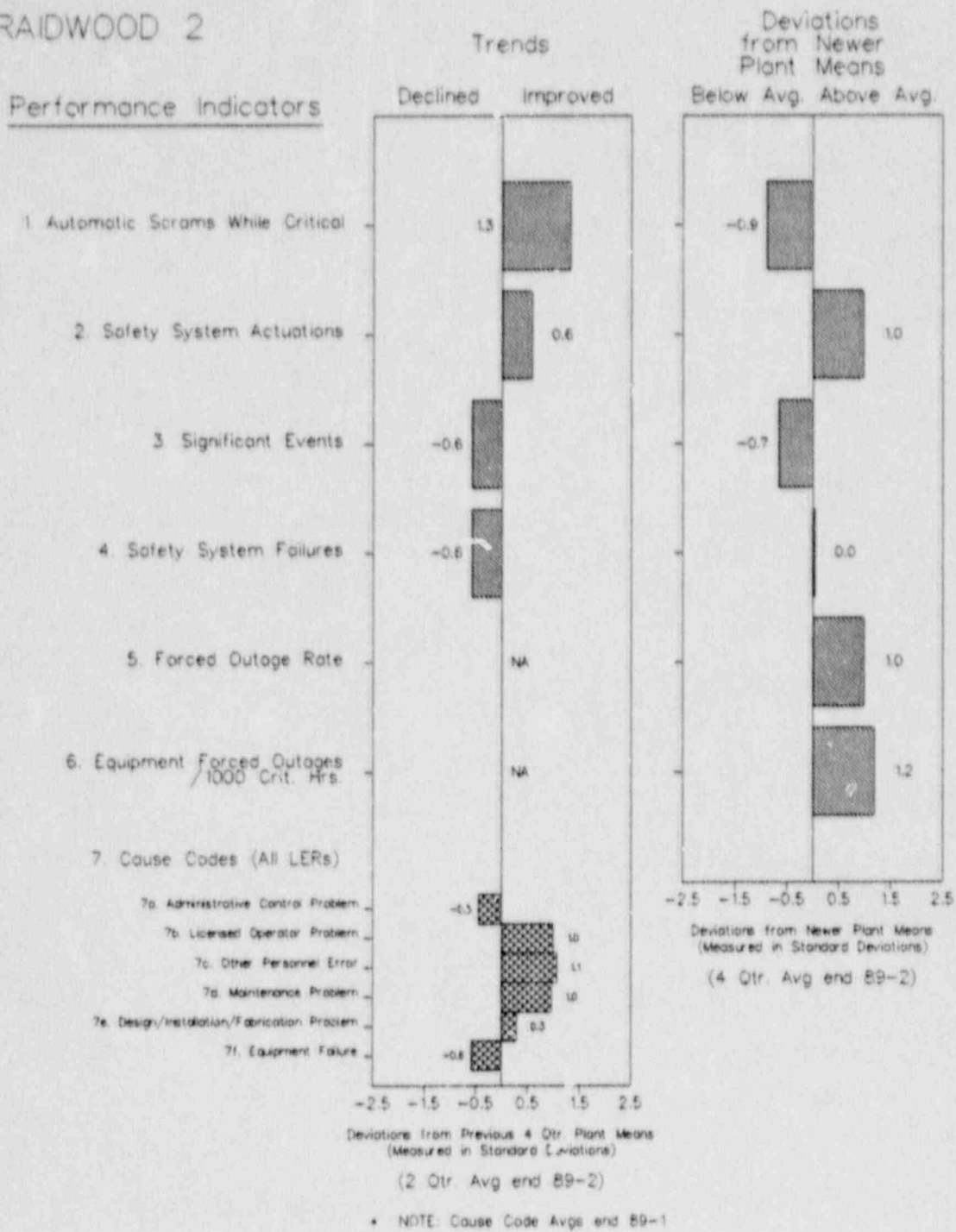


FIGURE 4.7

BRAIDWOOD 2



THIS

PAGE

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INTENTIONALLY

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FIGURE 4.7

Note: This is a comparison of BRAIDWOOD 2  
(a newer plant) against older plant means.

BRAIDWOOD 2

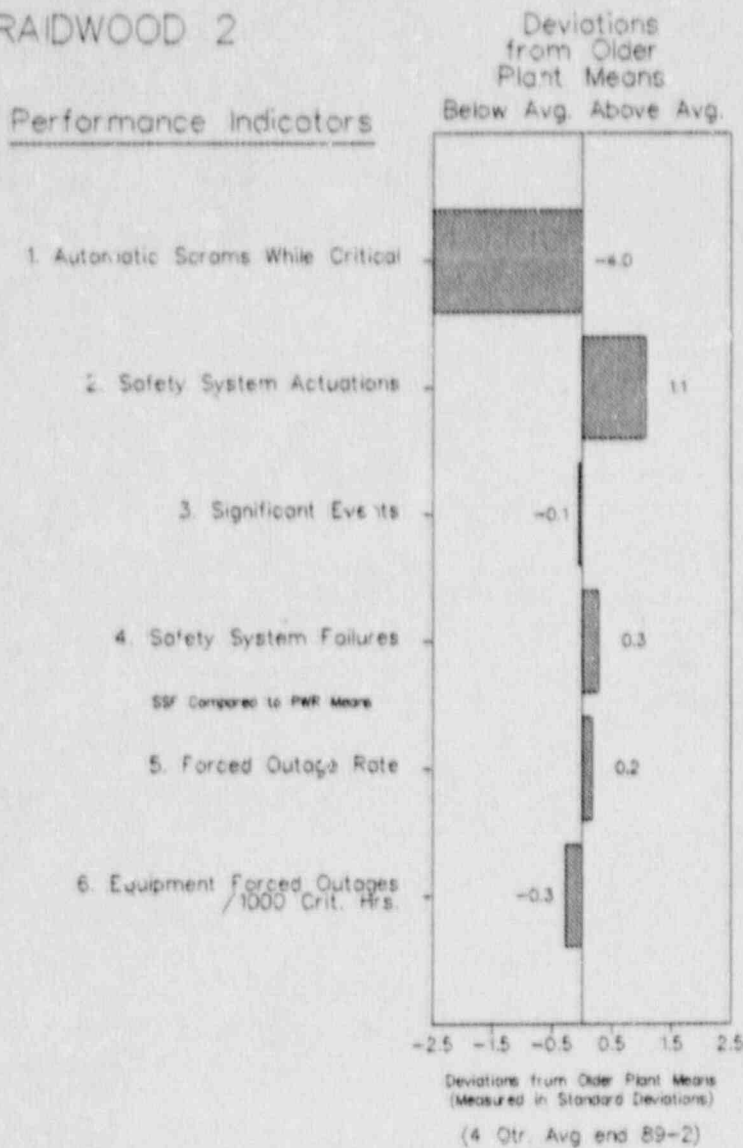


FIGURE 4.8

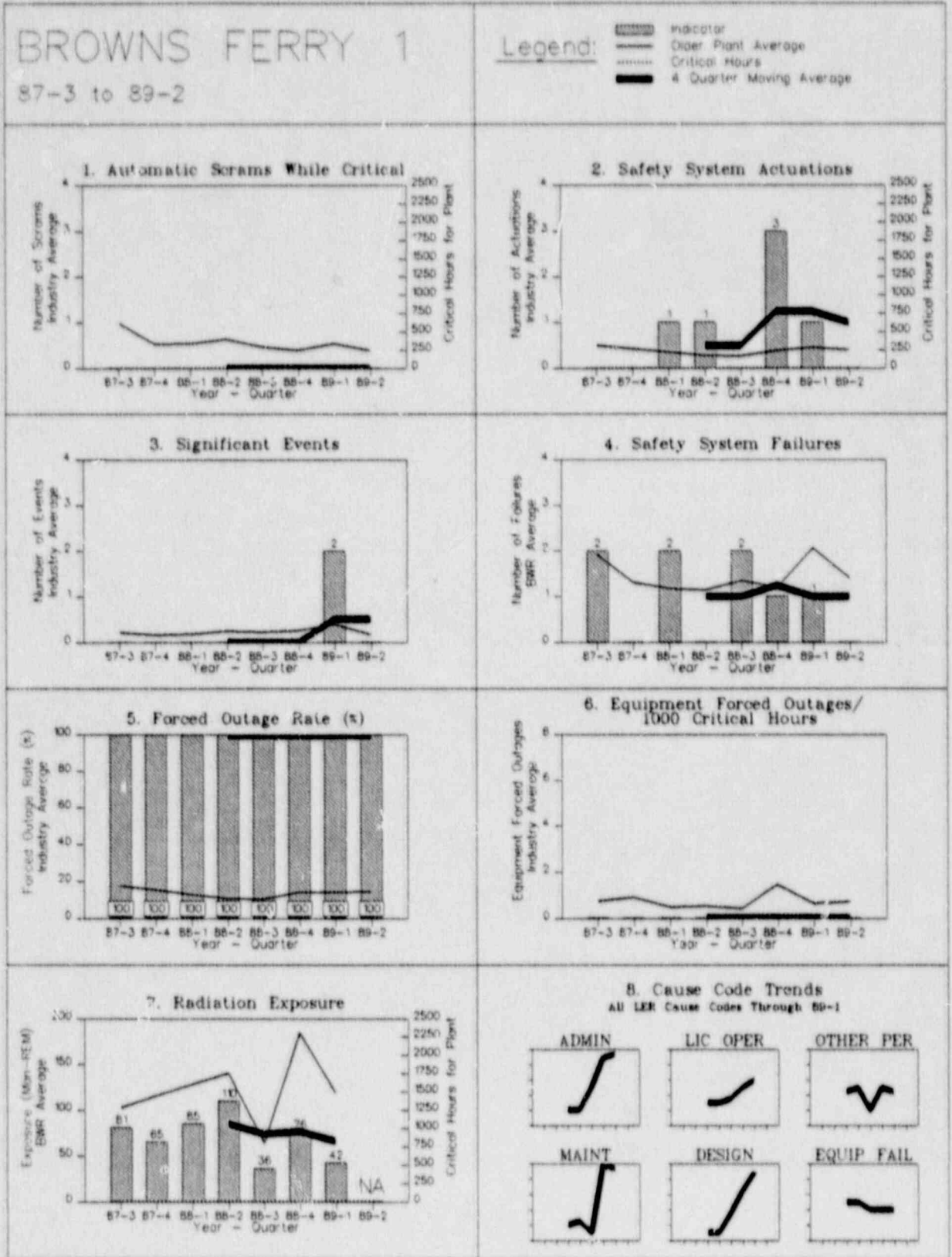


FIGURE 4.8

# BROWNS FERRY 1

## Performance Indicators

1. Automatic Scrams While Critical

2. Safety System Actuations

3. Significant Events

4. Safety System Failures

SSF Compared to BWR Means

5. Forced Outage Rate

6. Equipment Forced Outages / 1000 Crit. Hrs

7. Cause Codes (All LERs)

7a. Administrative Control Problem

7b. Licensed Operator Problem

7c. Other Personnel Error

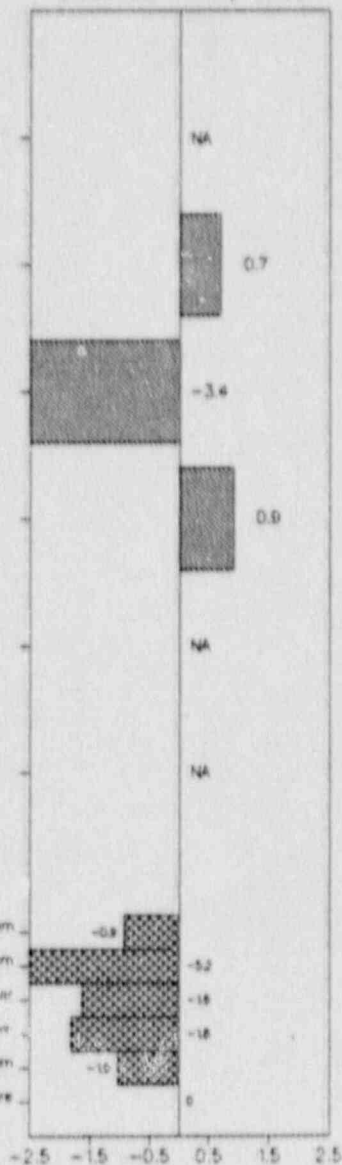
7d. Maintenance Problem

7e. Design/Installation/Fabrication Problem

7f. Equipment Failure

## Trends

Declined Improved



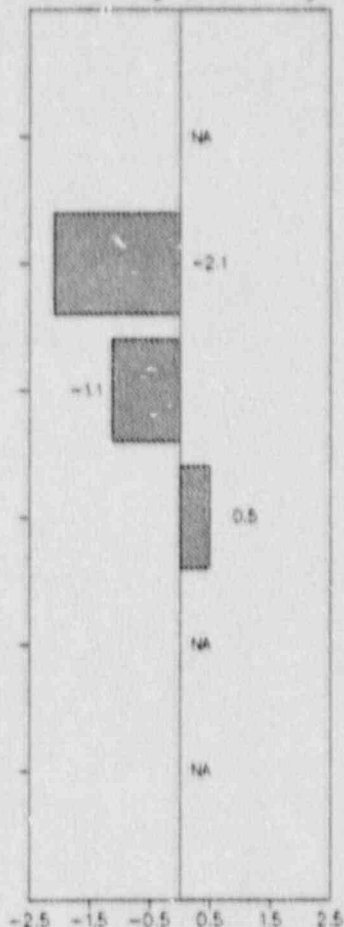
Deviations from Previous 4 Qtr. Plant Means (Measured in Standard Deviations)

(2 Qtr. Avg. end 89-2)

• NOTE: Cause Code Avgs. end 89-1

## Deviations from Older Plant Means

Below Avg. Above Avg.



Deviations from Older Plant Means (Measured in Standard Deviations)

(4 Qtr. Avg. end 89-2)

FIGURE 4.9

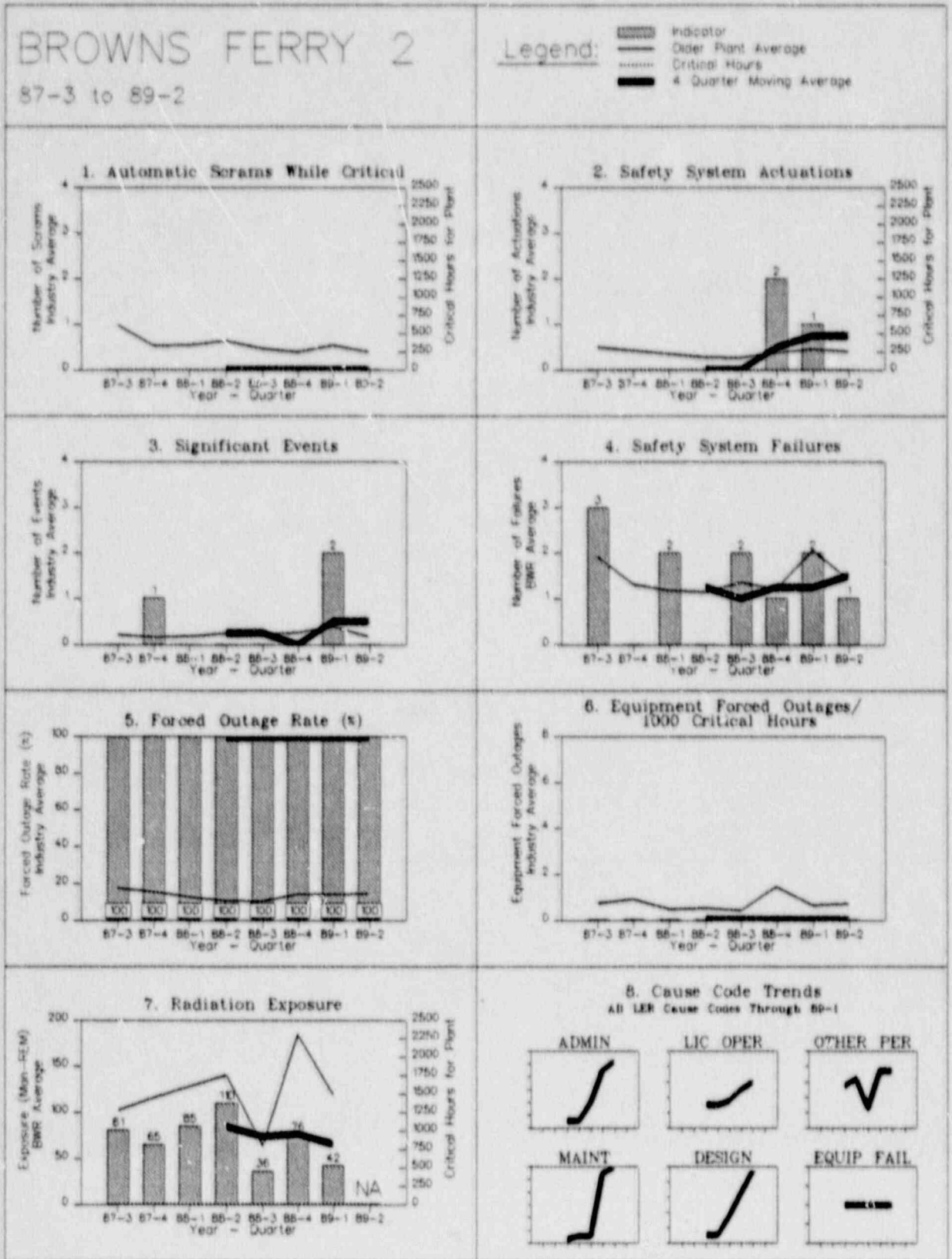


FIGURE 4.9

BROWNS FERRY 2

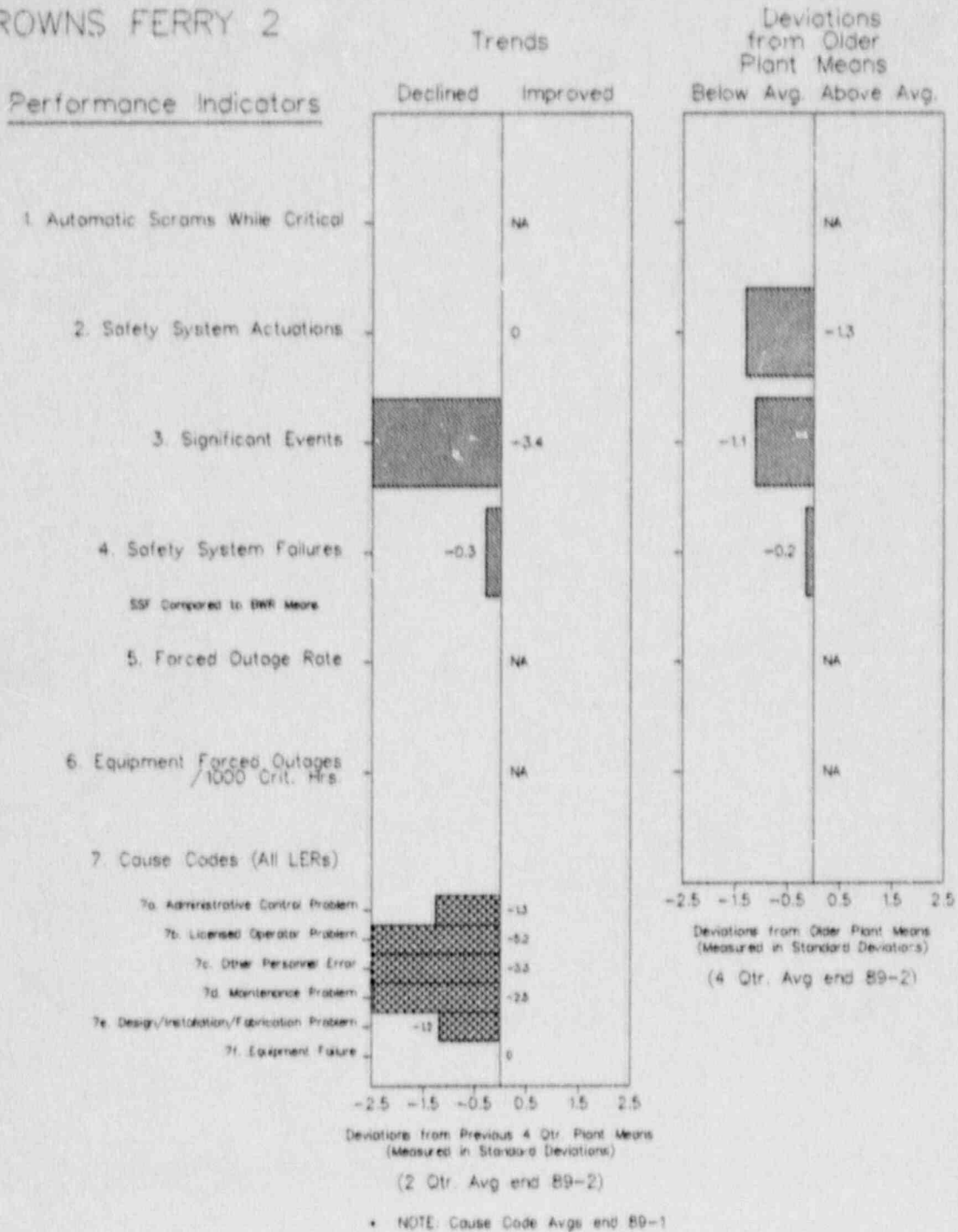


FIGURE 4.10

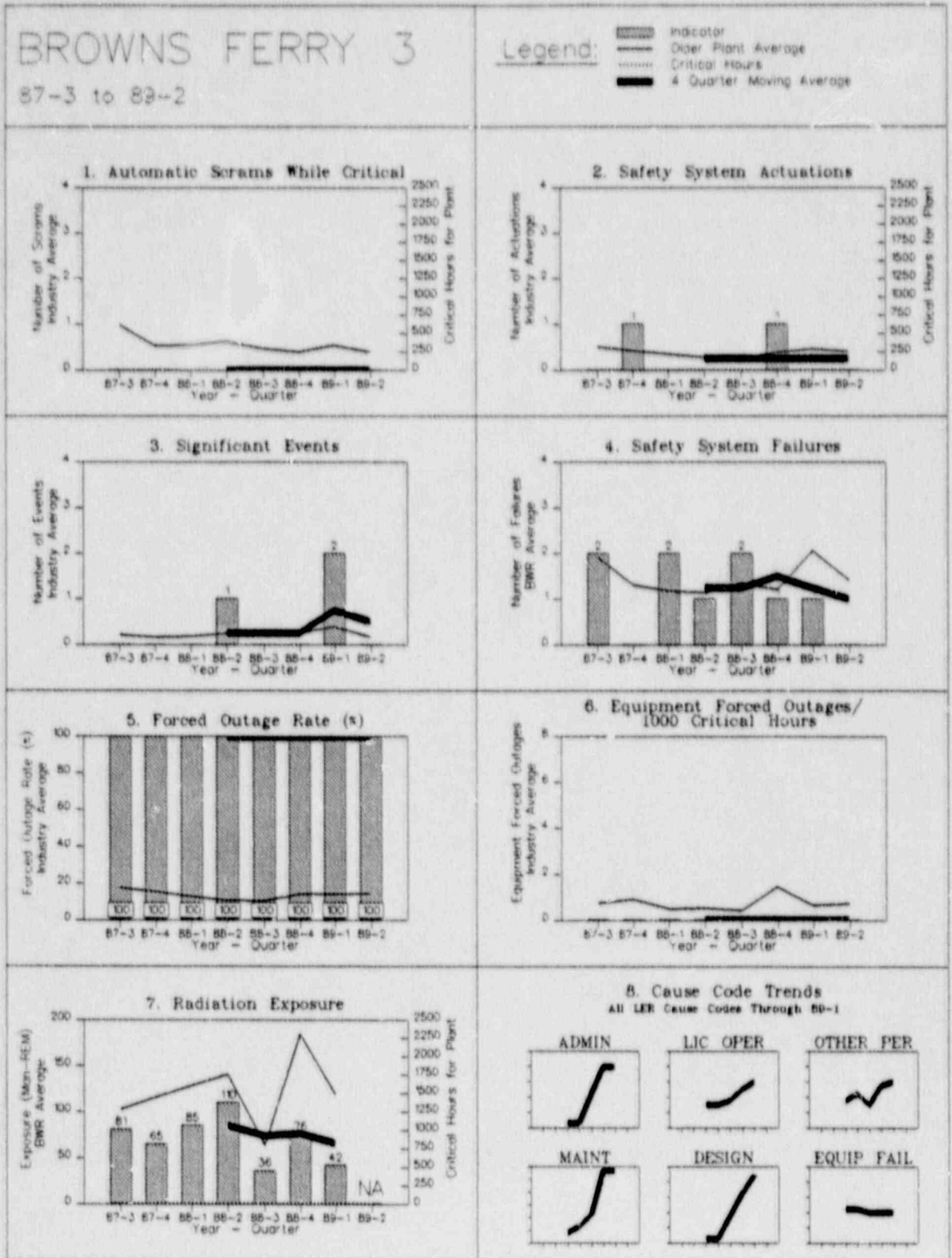


FIGURE 4.10

# BROWNS FERRY 3

## Performance Indicators

1. Automatic Scrams While Critical

2. Safety System Actuations

3. Significant Events

4. Safety System Failures

SSF Compared to BFR Means

5. Forced Outage Rate

6. Equipment Forced Outages / 1000 Crit. Hrs

7. Cause Codes (All LERs)

7a. Administrative Control Problem

7b. Licensed Operator Problem

7c. Other Personnel Error

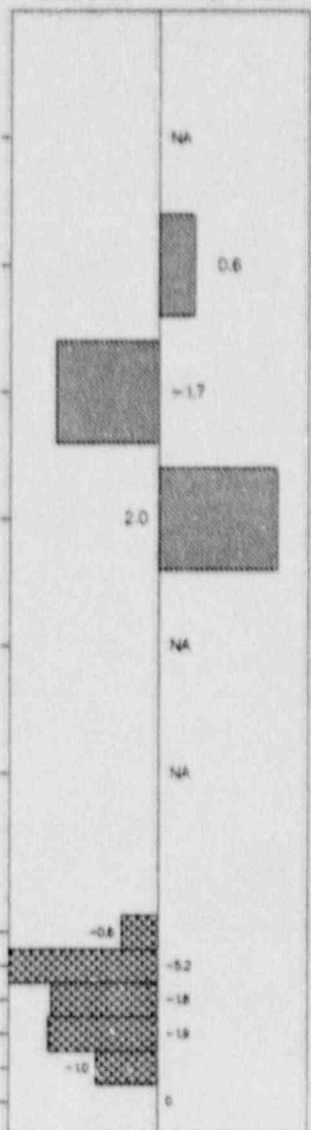
7d. Maintenance Problem

7e. Design/Installation/Fabrication Problem

7f. Equipment Failure

## Trends

Declined Improved



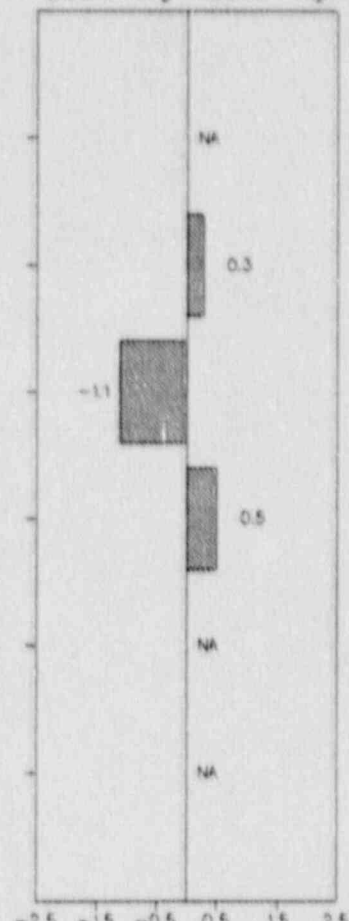
Deviations from Previous 4 Qtr. Plant Means (Measured in Standard Deviations)

(2 Qtr. Avg end 89-2)

• NOTE: Cause Code Avgs end 89-1

## Deviations from Older Plant Means

Below Avg. Above Avg.



-2.5 -1.5 -0.5 0.5 1.5 2.5

Deviations from Older Plant Means (Measured in Standard Deviations)

(4 Qtr. Avg end 89-2)

FIGURE 4.11

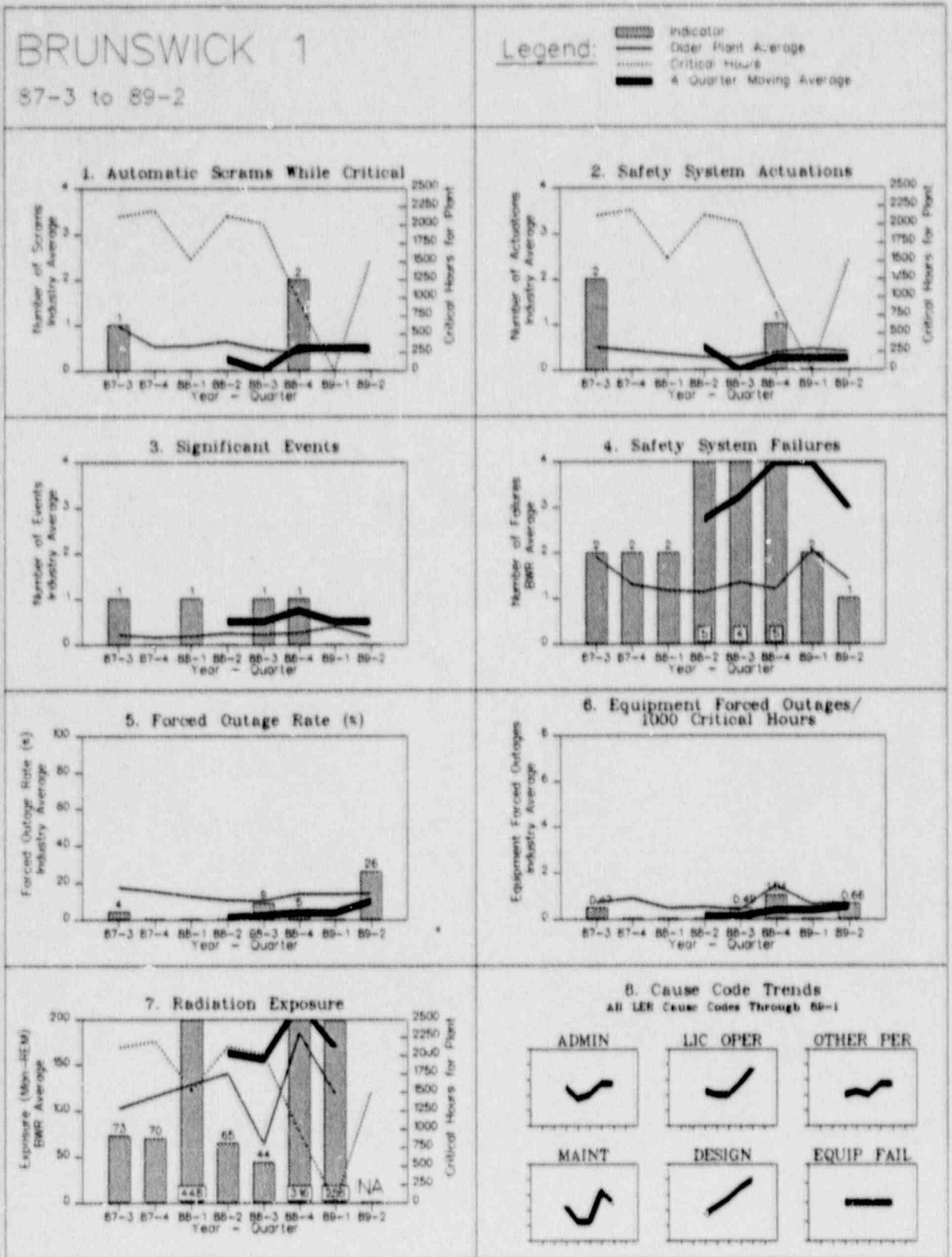




FIGURE 6.11

BRUNSWICK 1

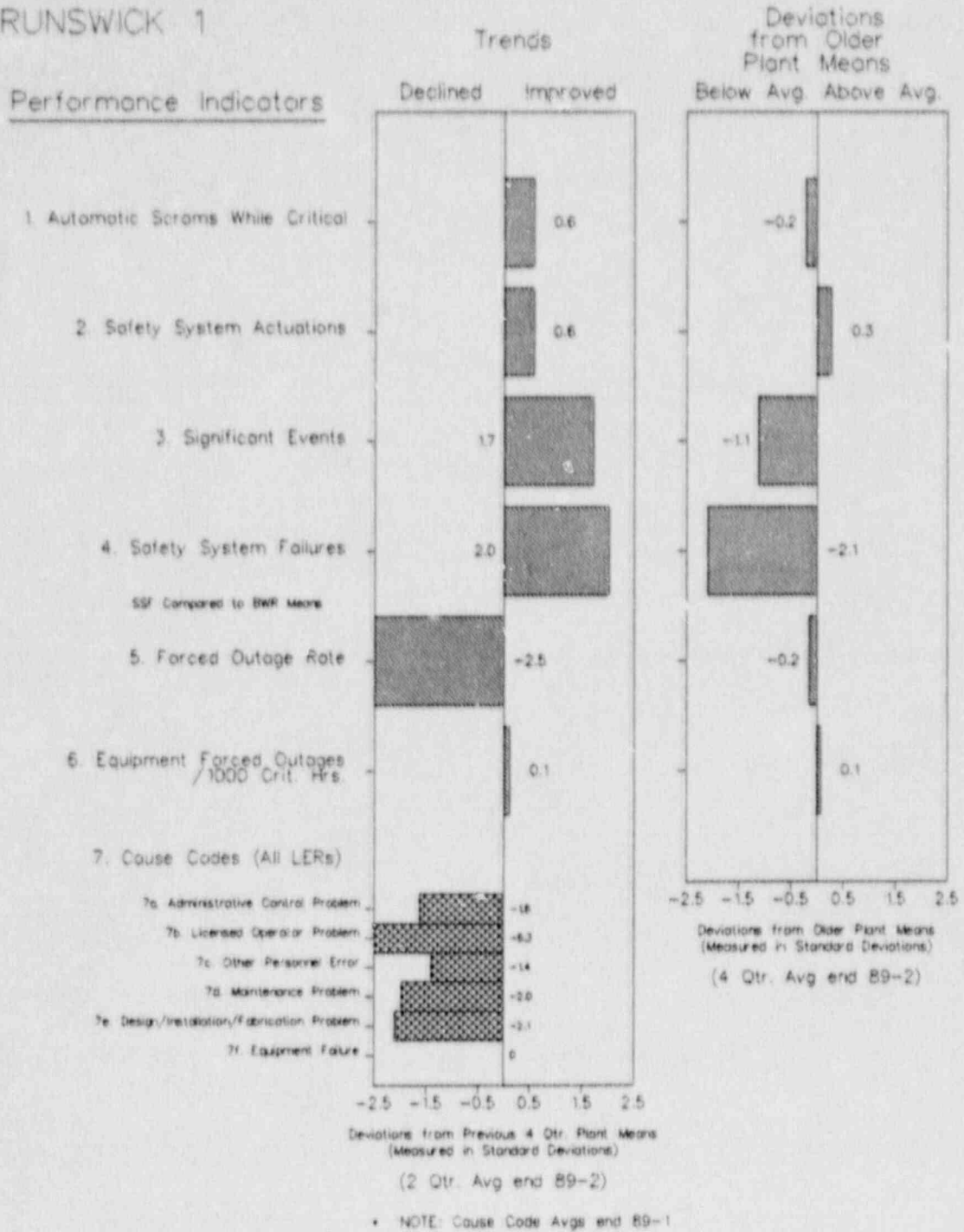


FIGURE 4.12

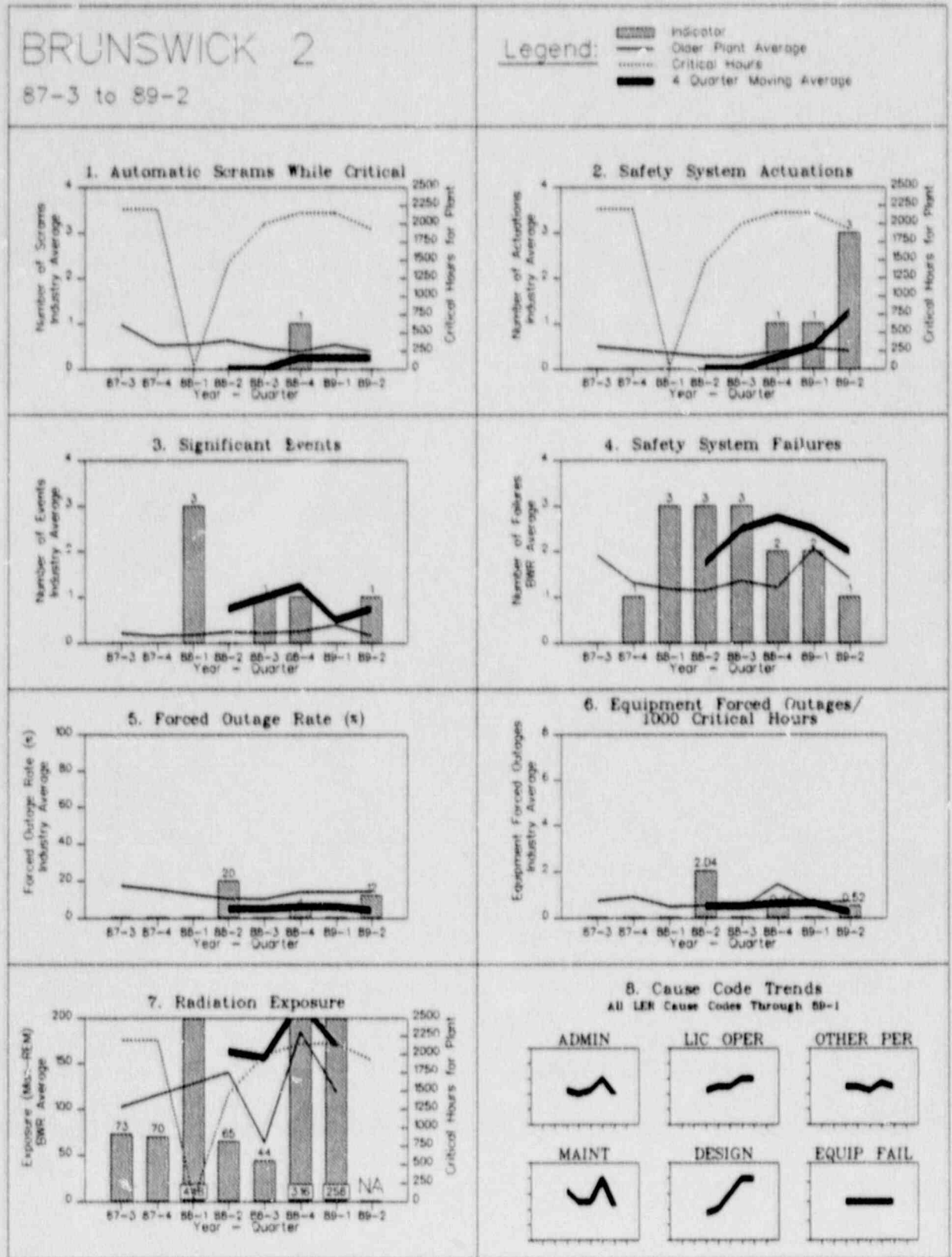


FIGURE 4.12

BRUNSWICK 2

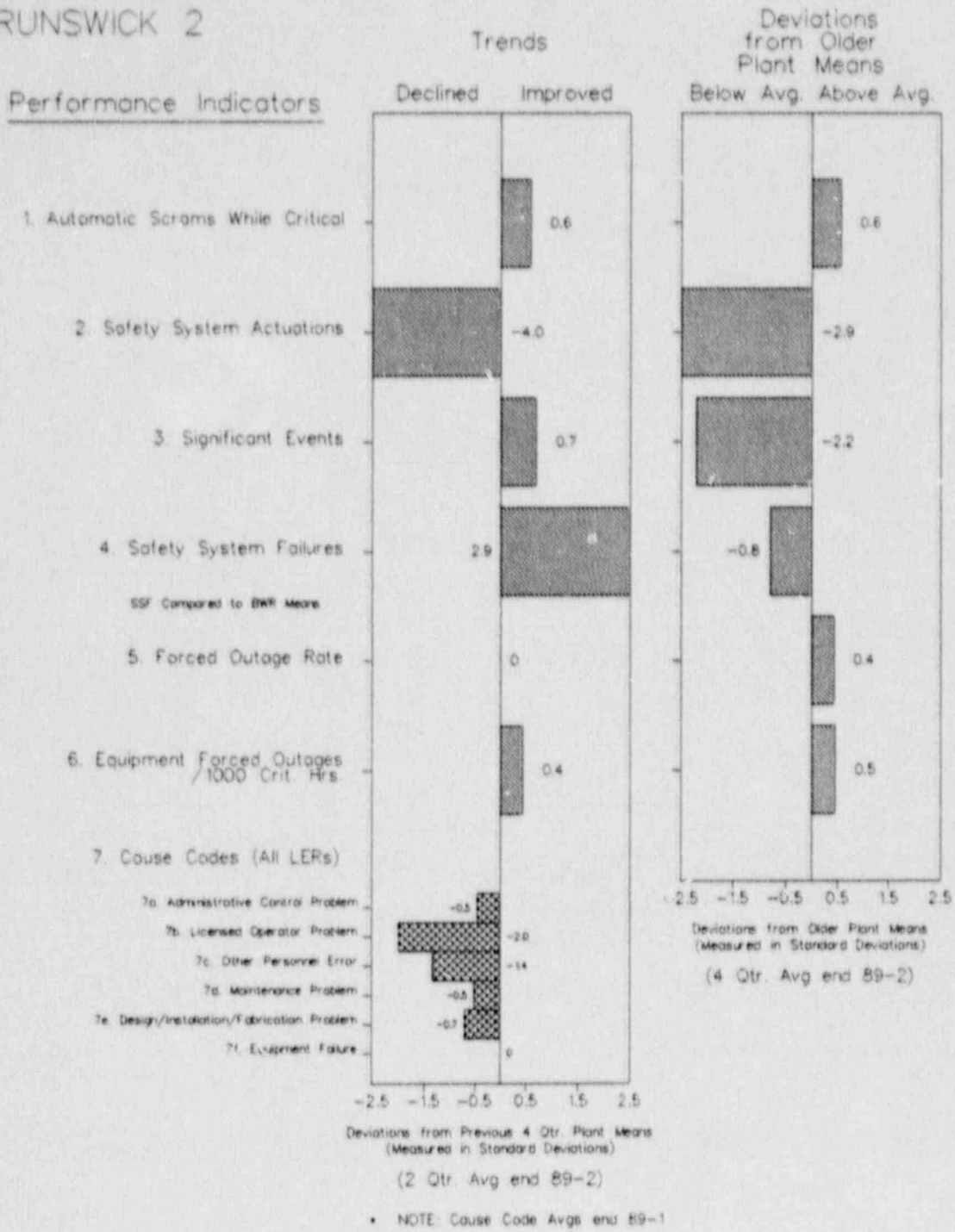


FIGURE 4.13

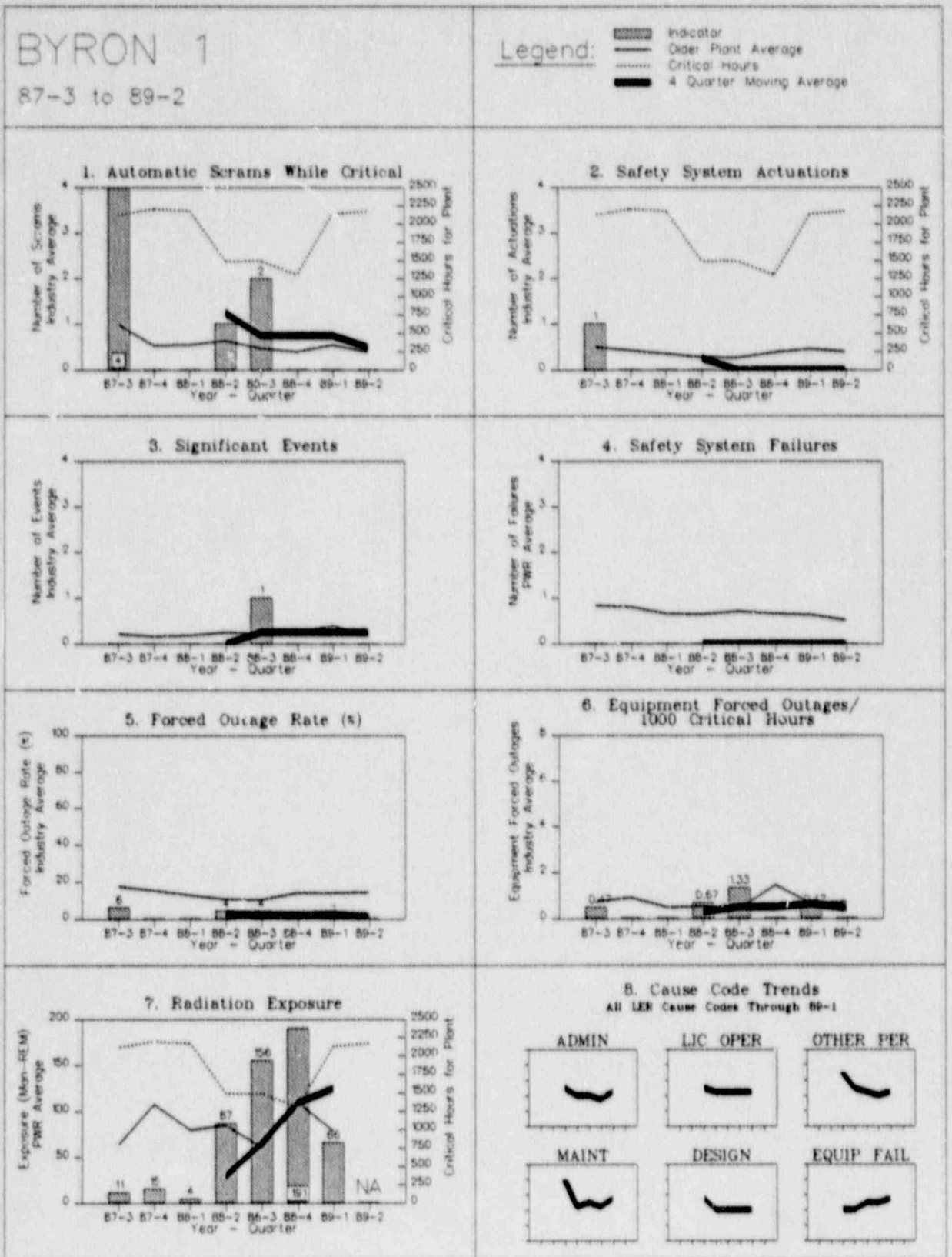


FIGURE 4.13

BYRON 1

Performance Indicators

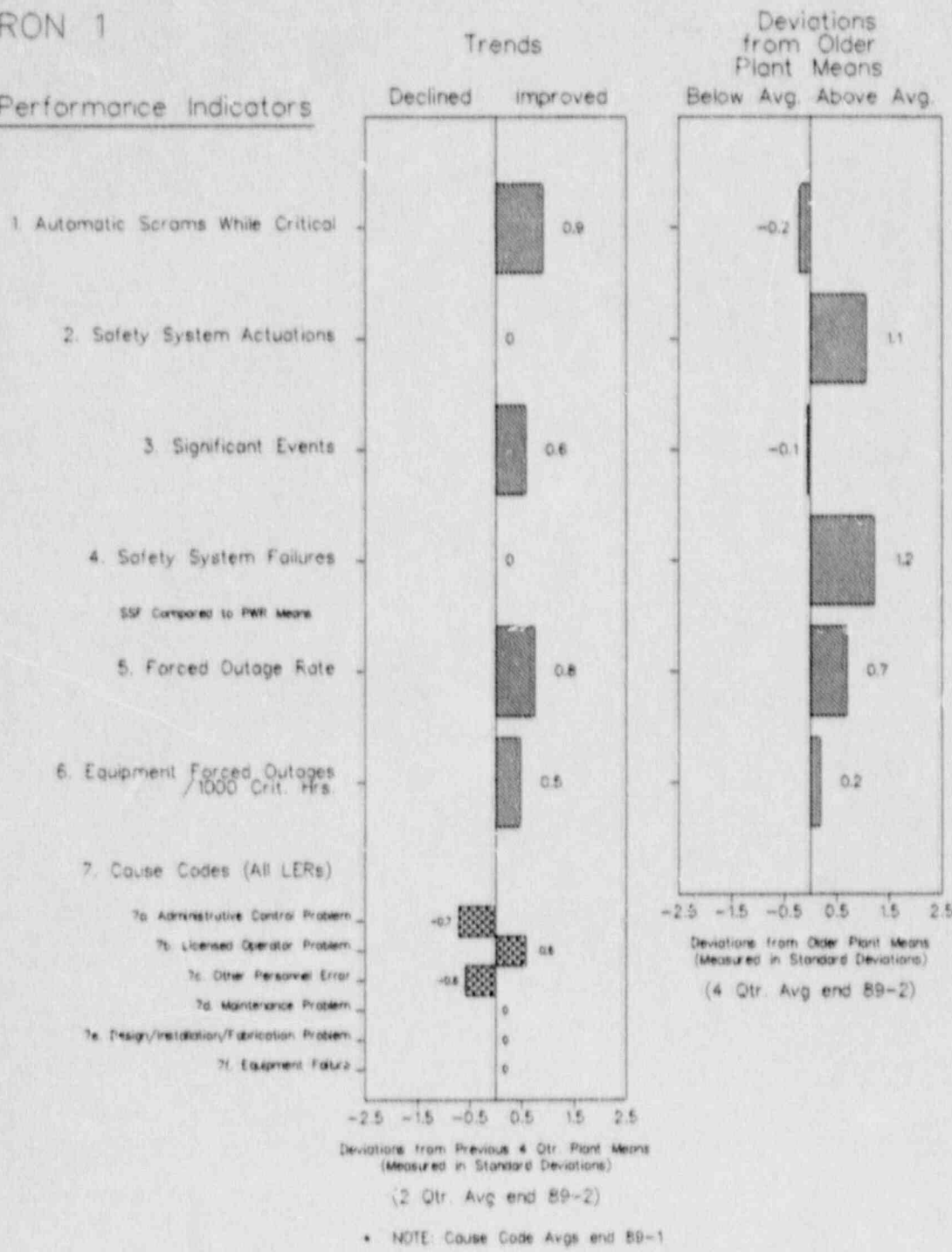


FIGURE 4.14

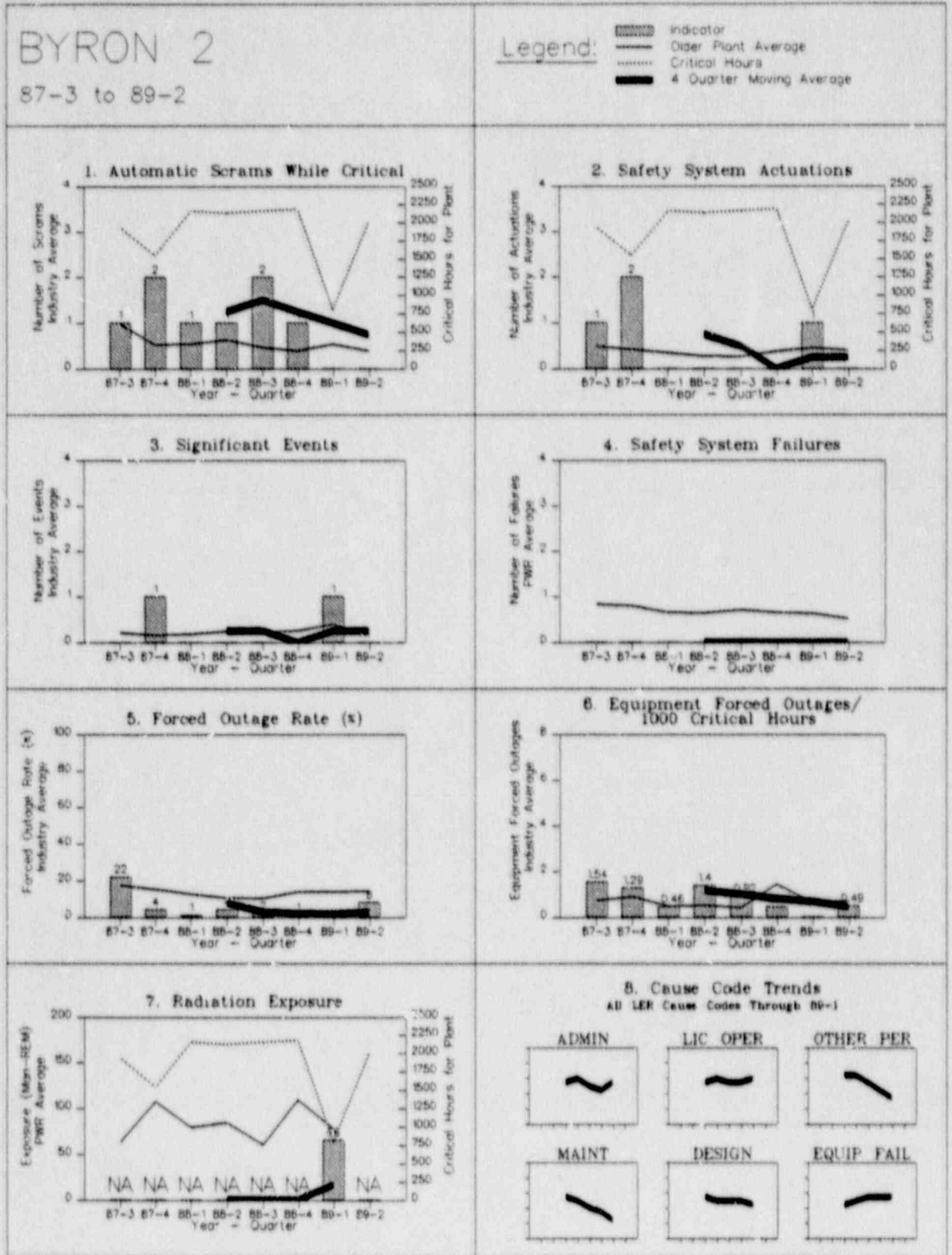


FIGURE 4.14

BYRON 2

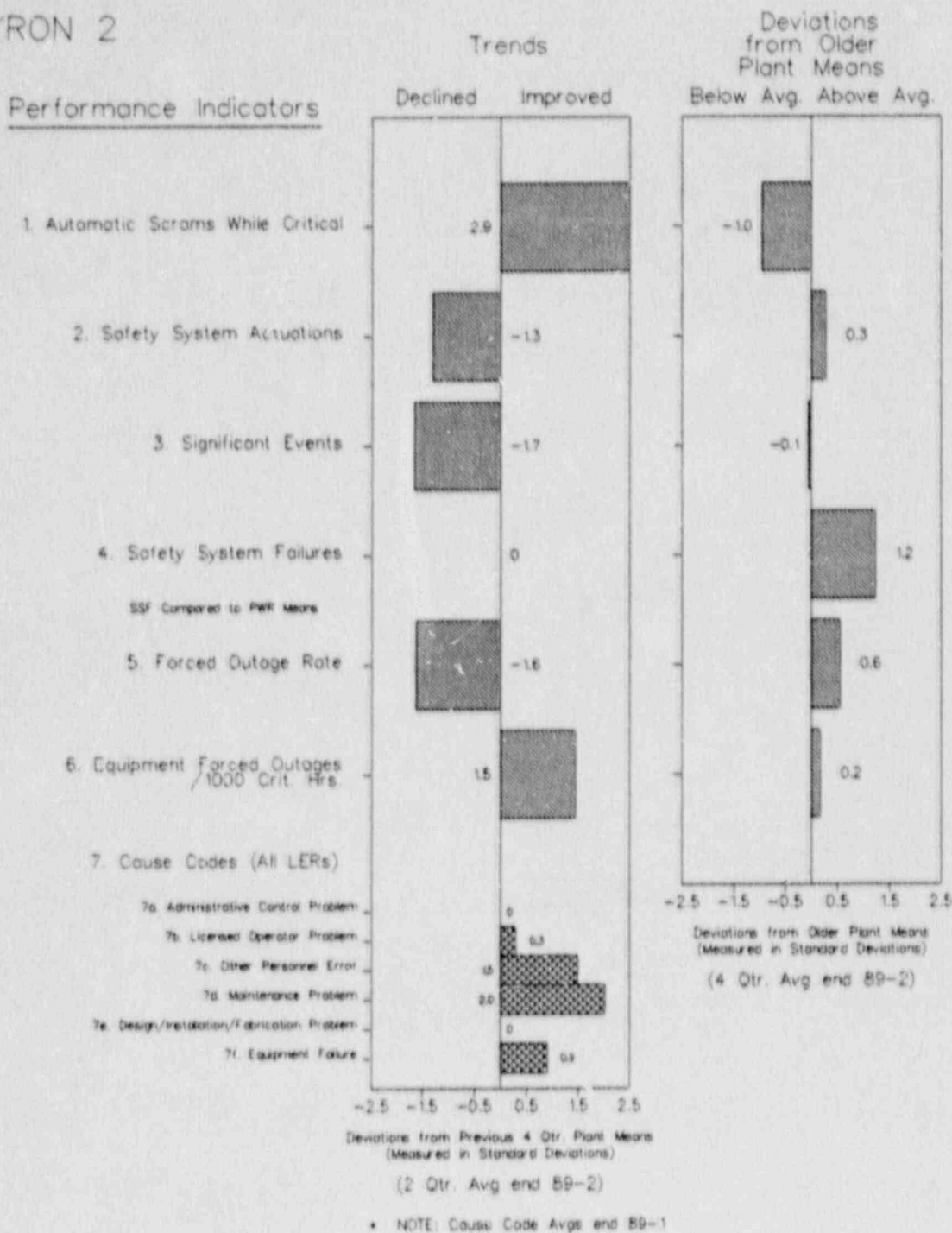


FIGURE 4.15

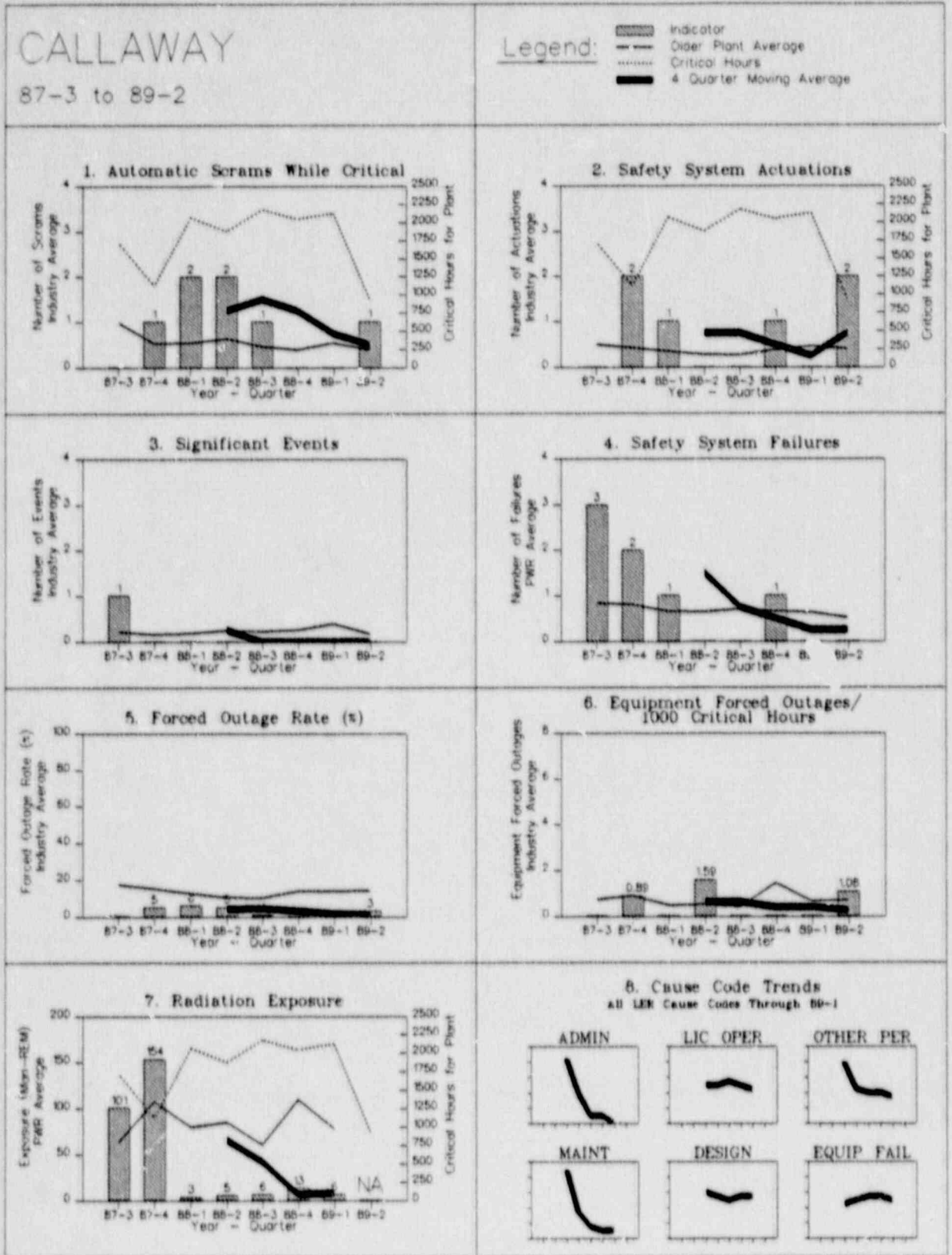
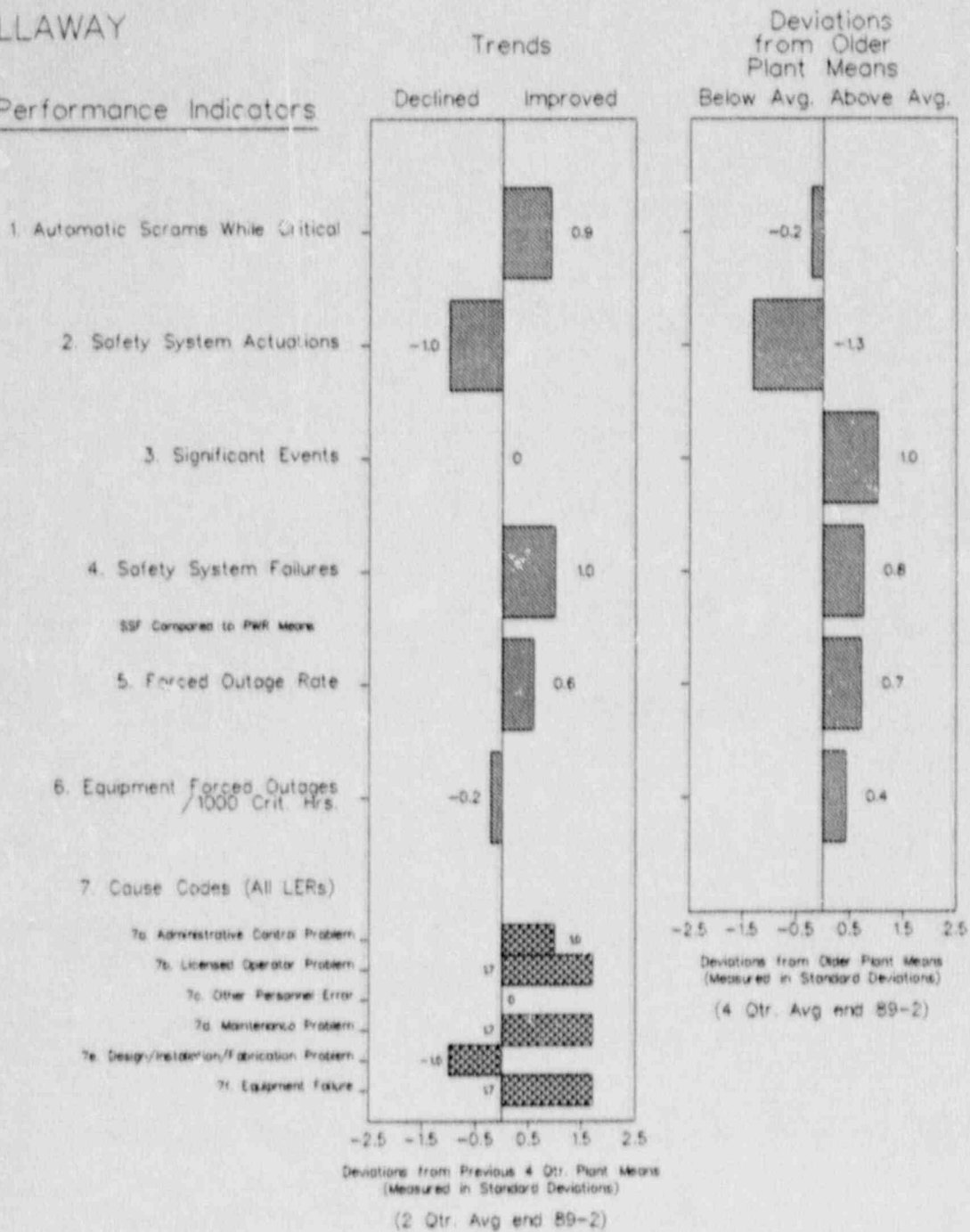




FIGURE 4.15

CALLAWAY

Performance Indicators



\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.16

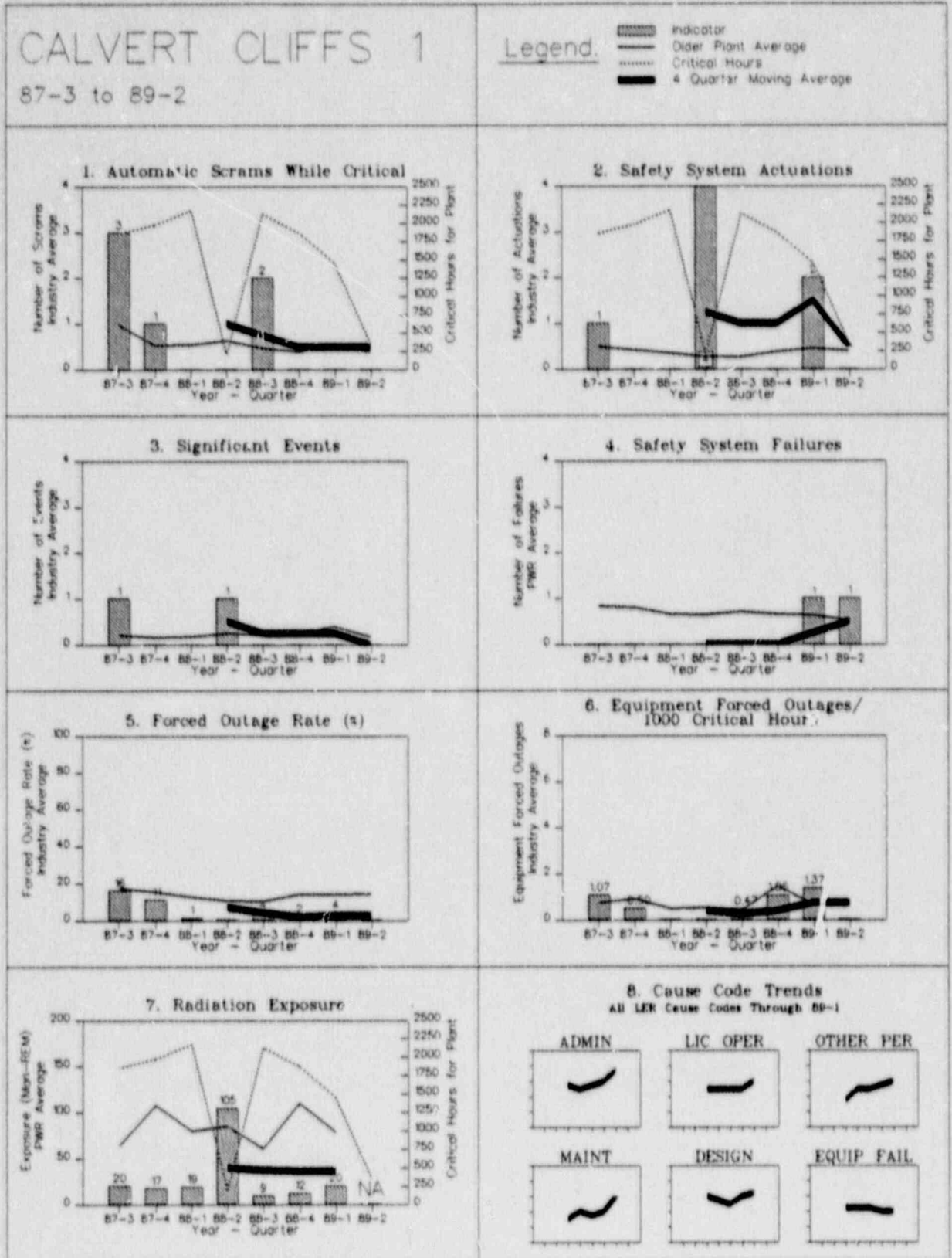
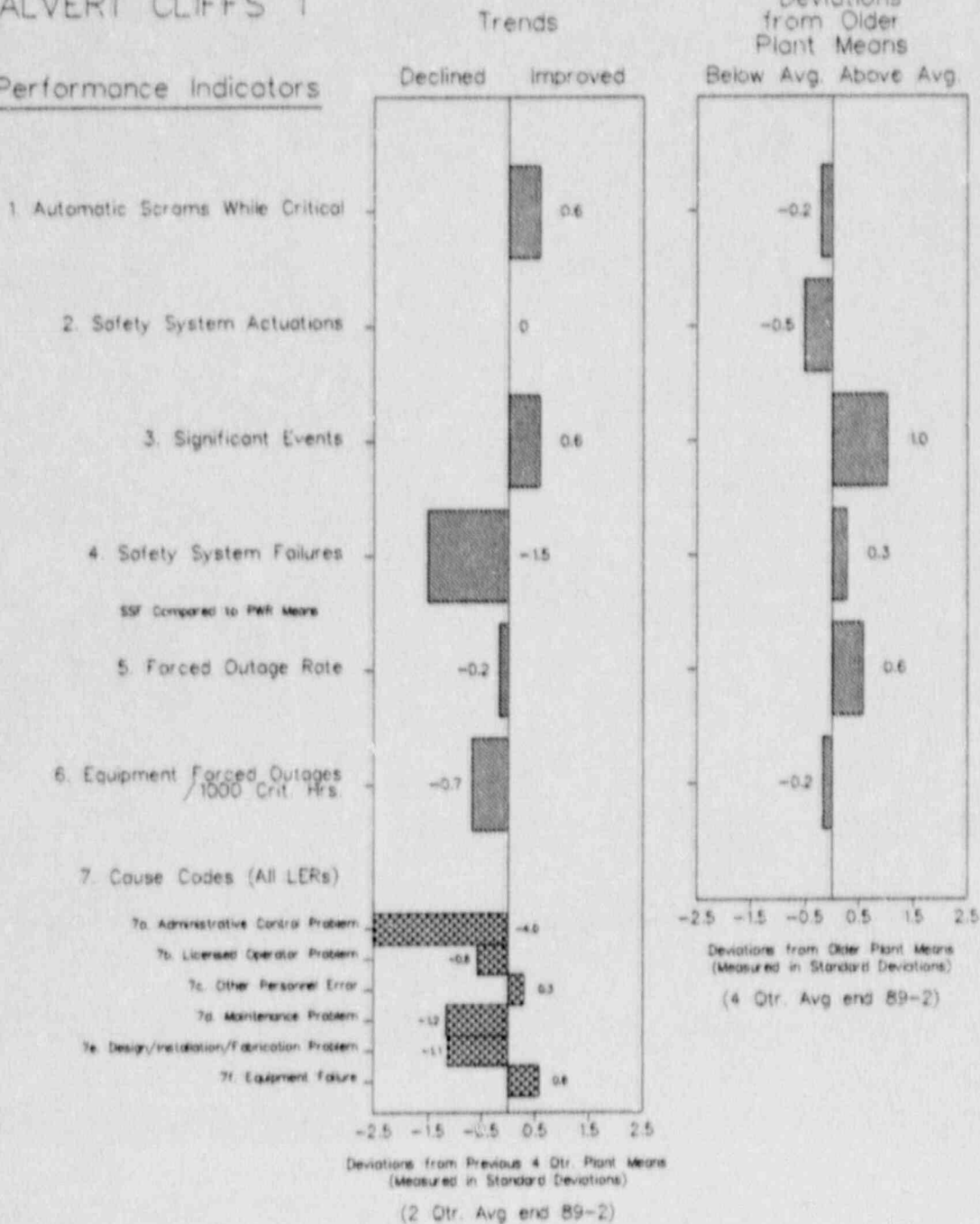


FIGURE 4.16

# CALVERT CLIFFS 1

## Performance Indicators



• NOTE: Cause Code Aves end 89-1

FIGURE 4.17

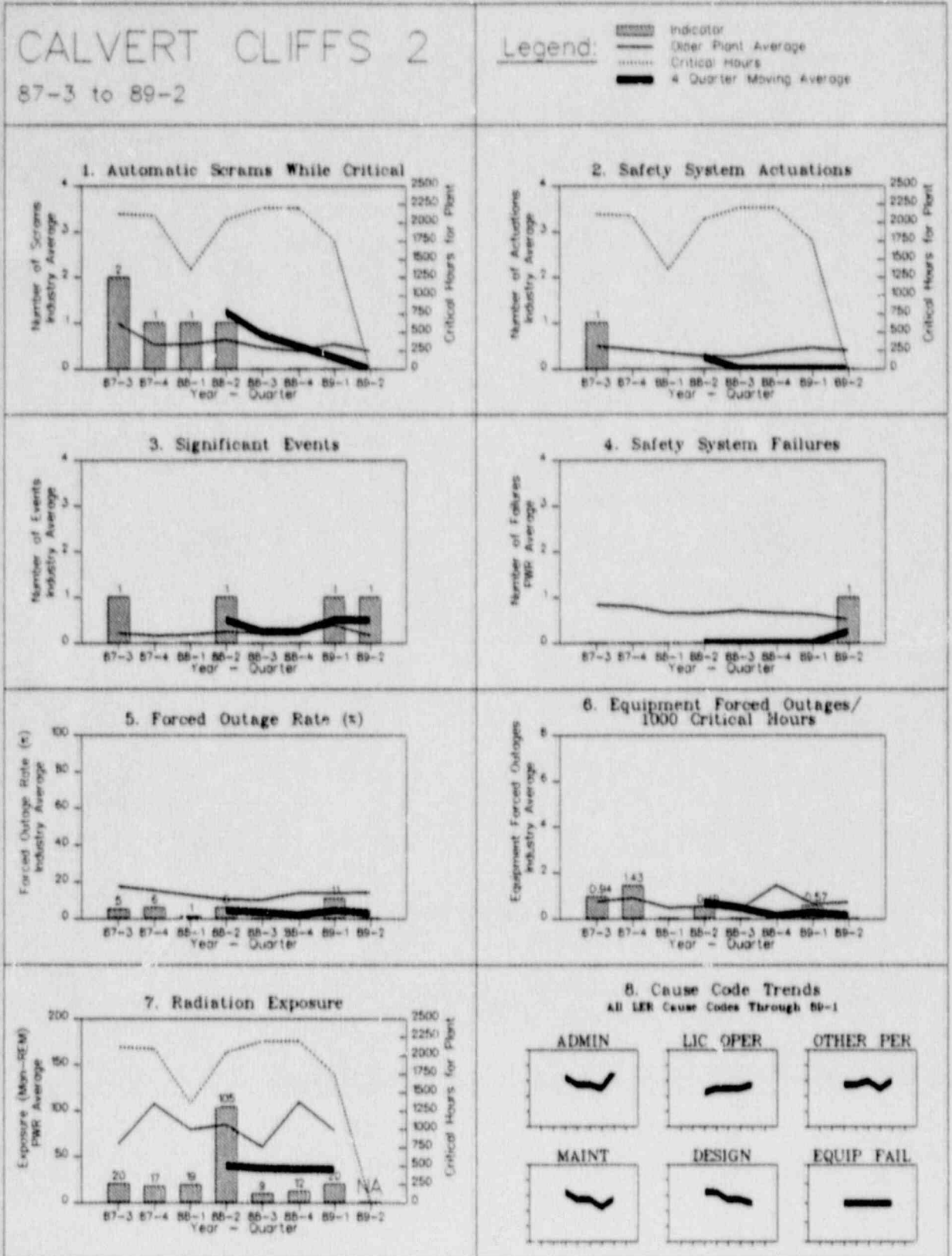
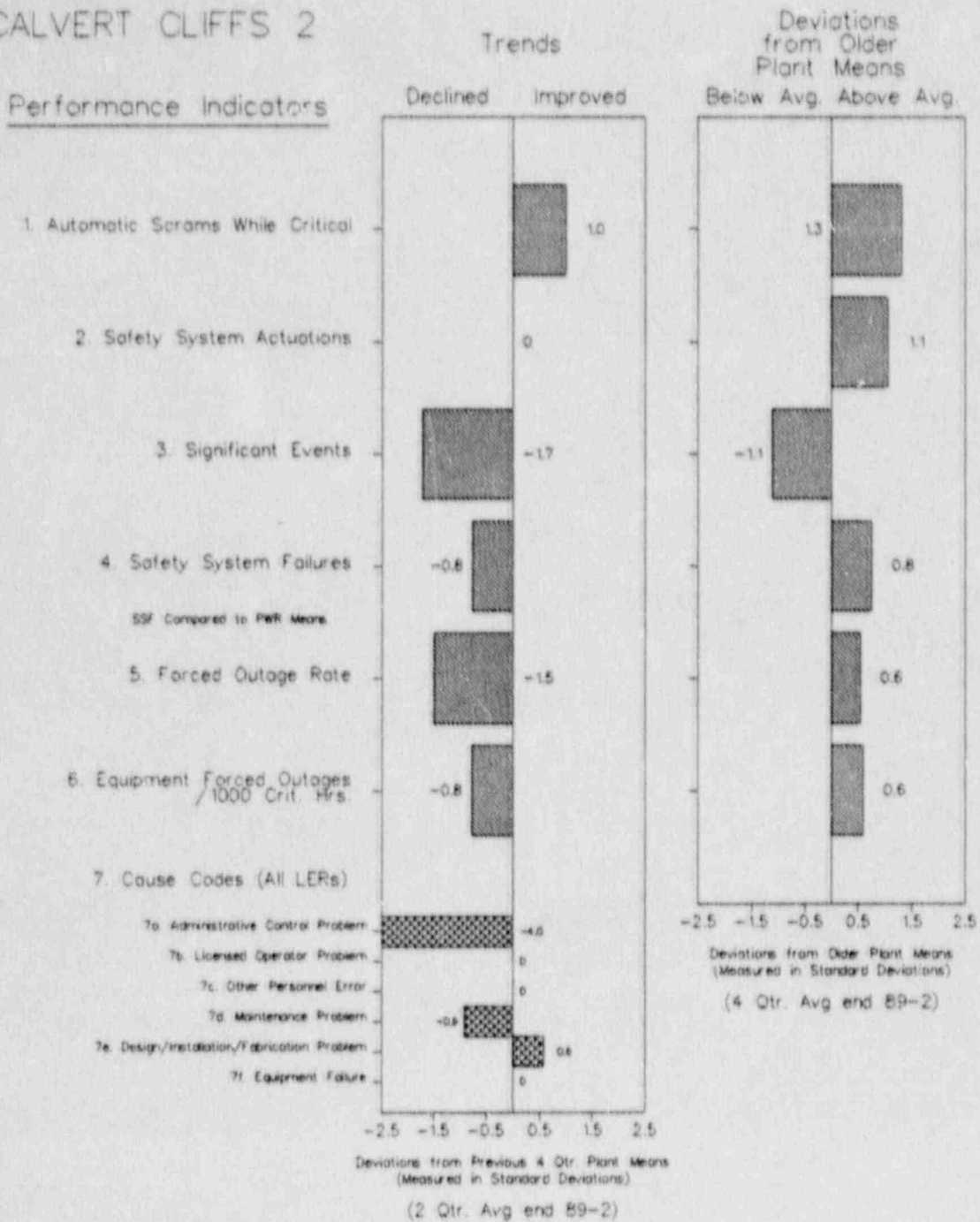


FIGURE 4.17

CALVERT CLIFFS 2



• NOTE: Cause Code Avgs end 89-1

FIGURE 4.18

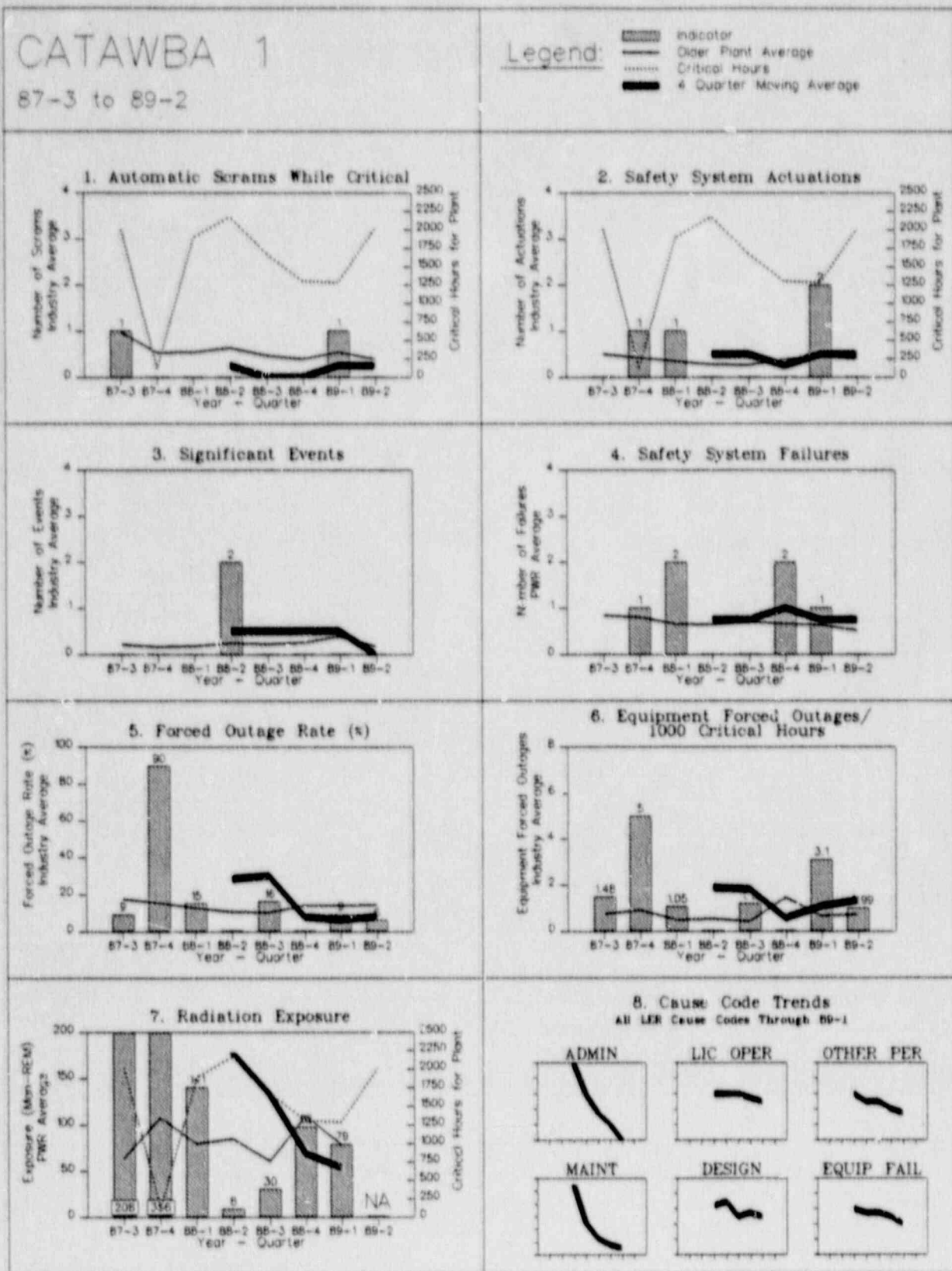
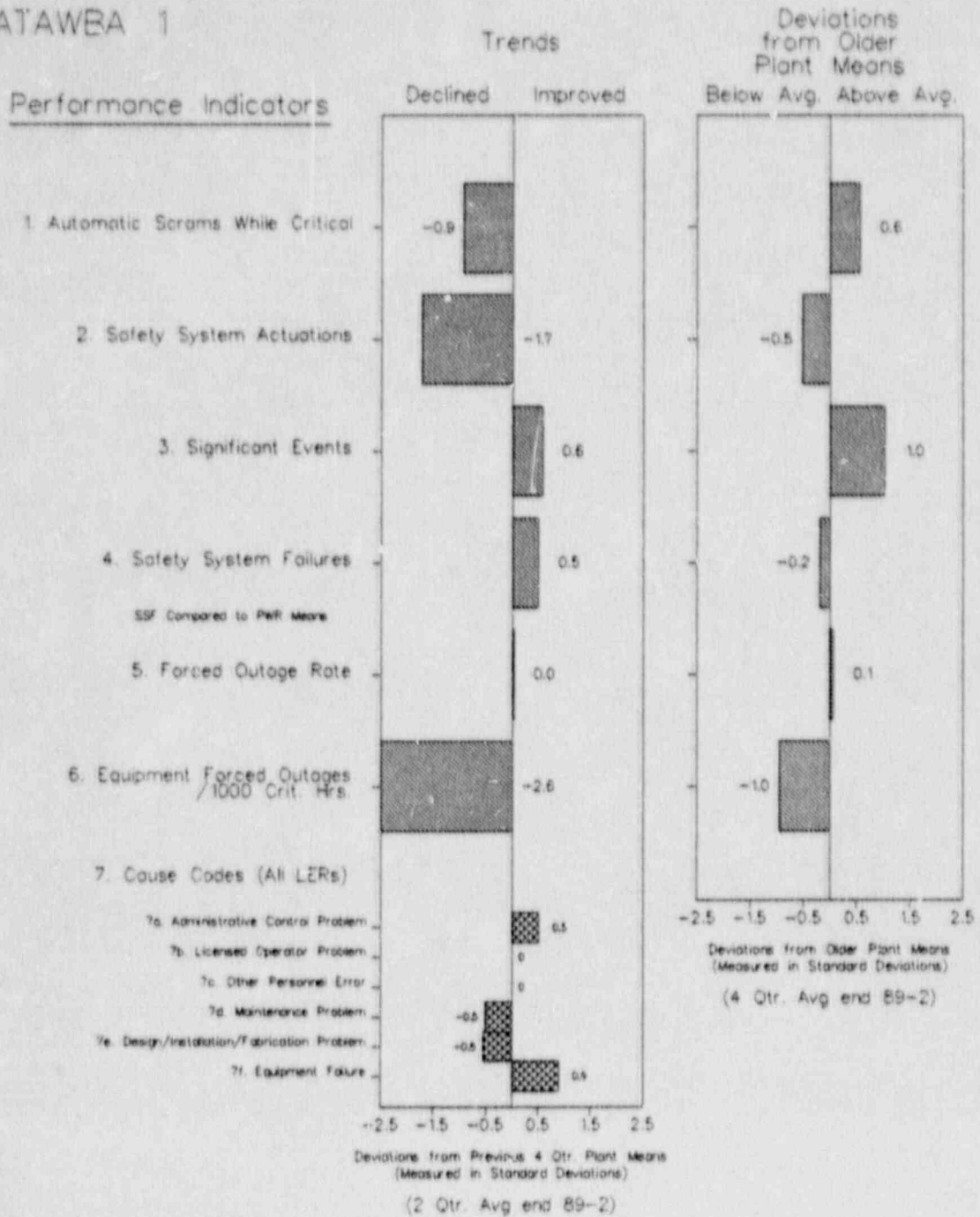


FIGURE 4.18

CATAWBA 1



\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.19

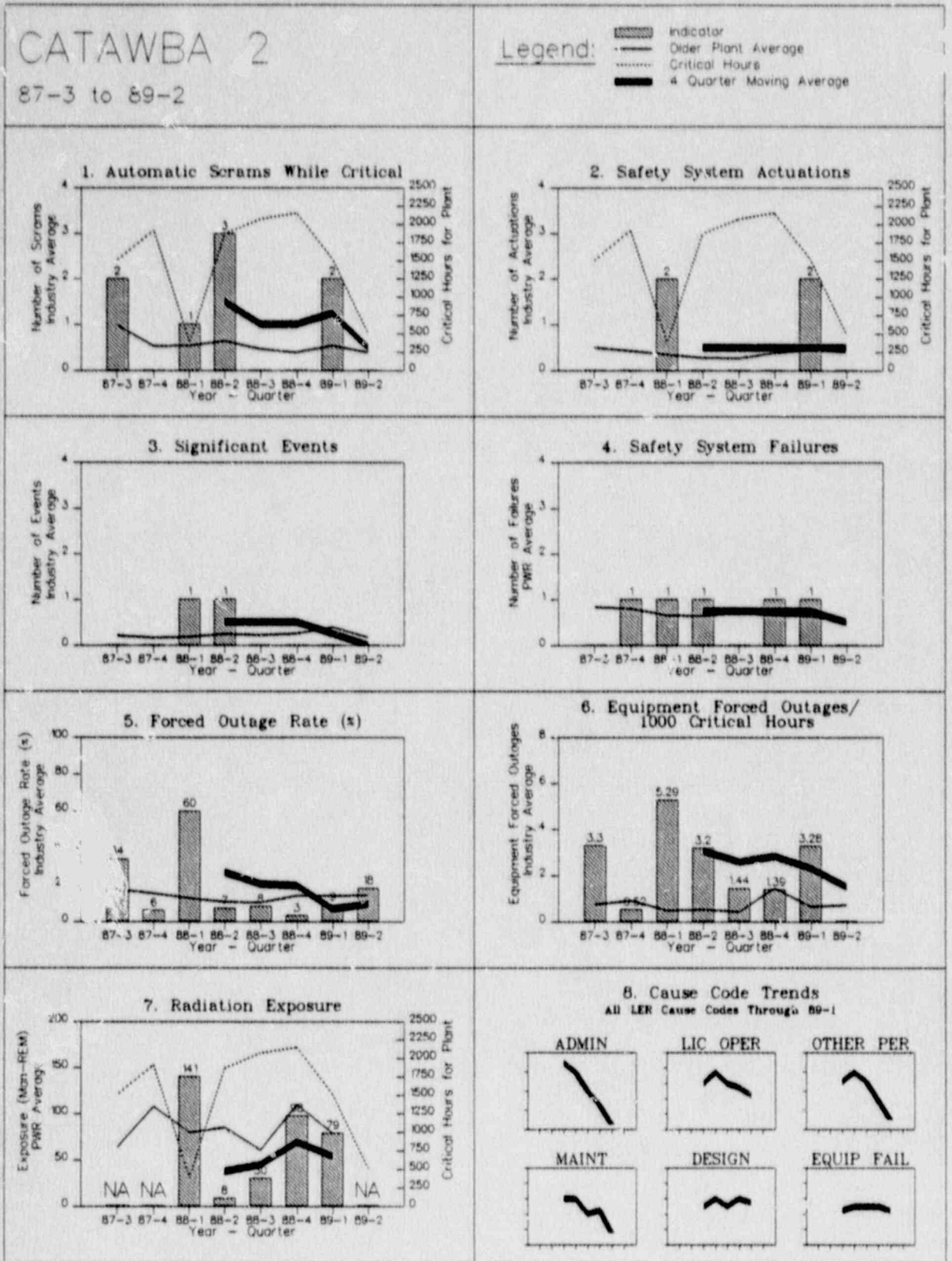
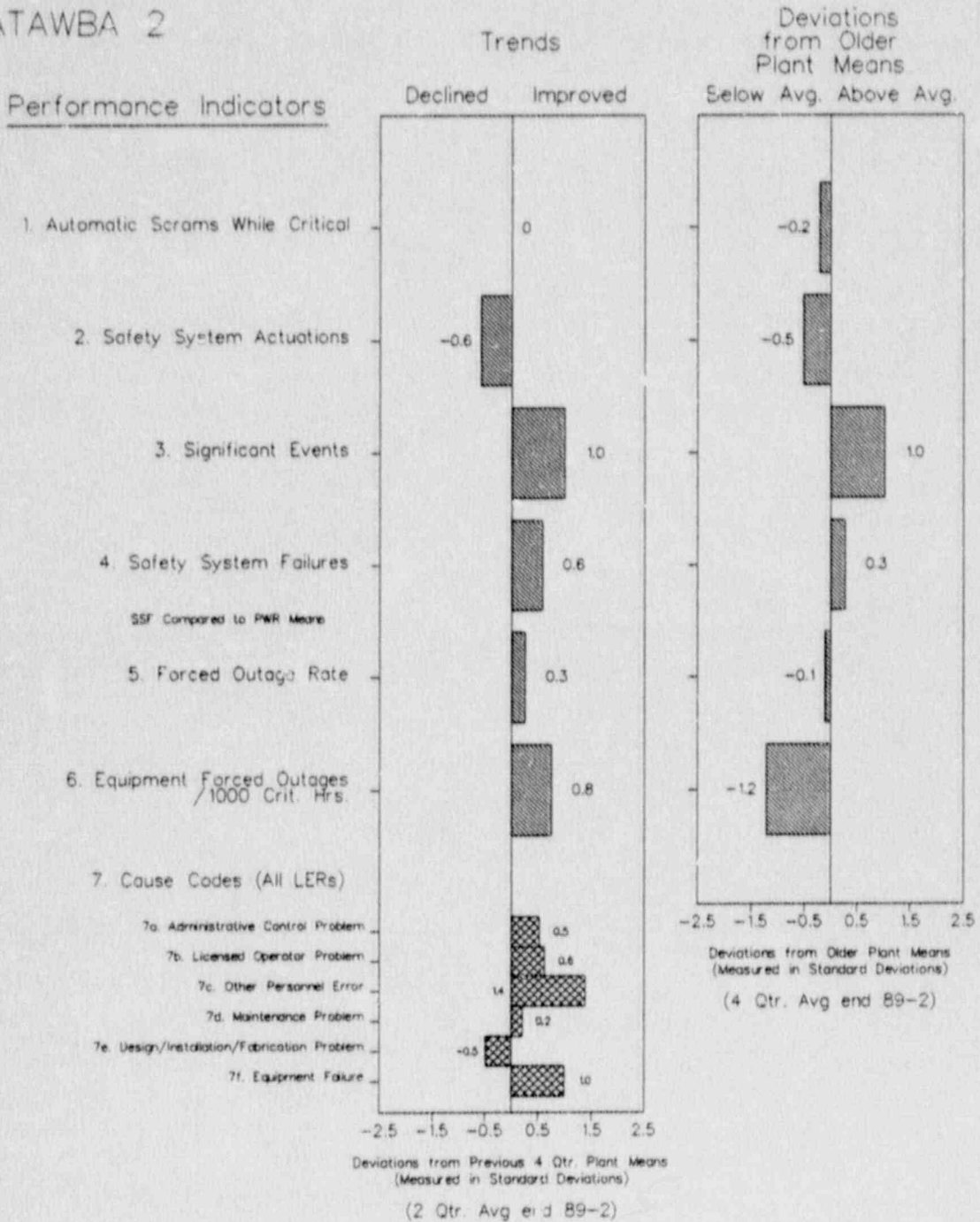




FIGURE 4.19

CATAWBA 2



\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.20

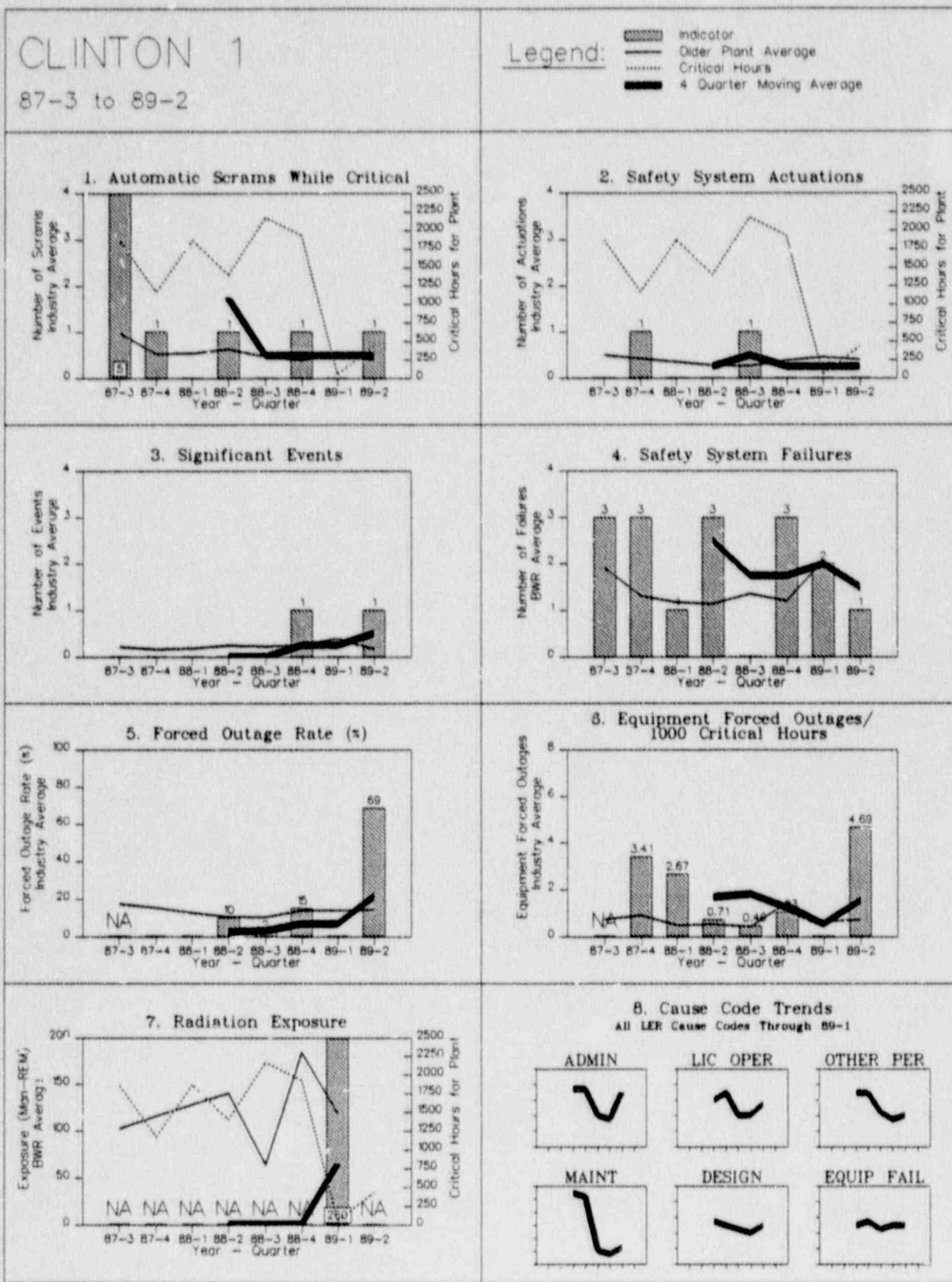


FIGURE 4.20

CLINTON 1

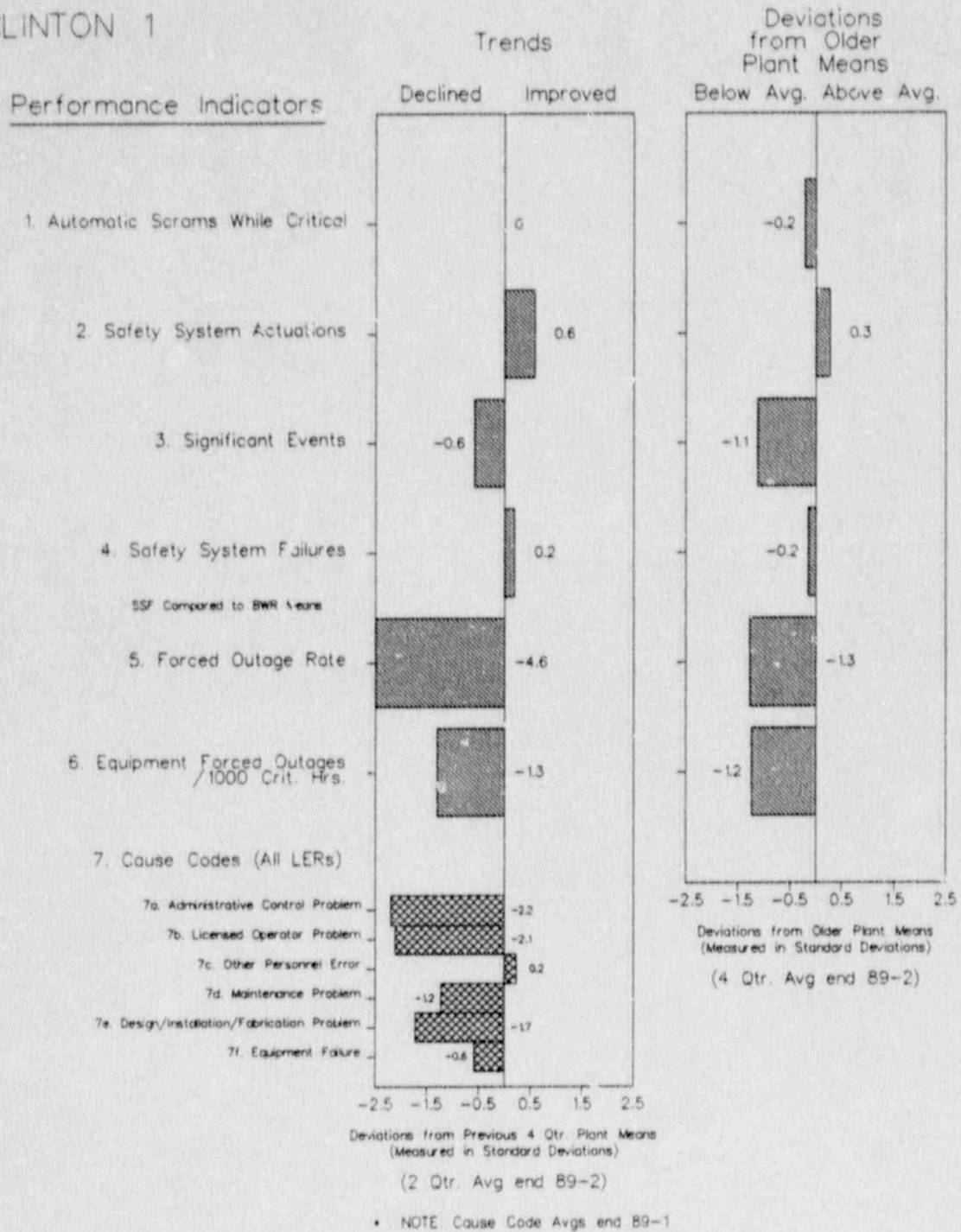


FIGURE 4.21

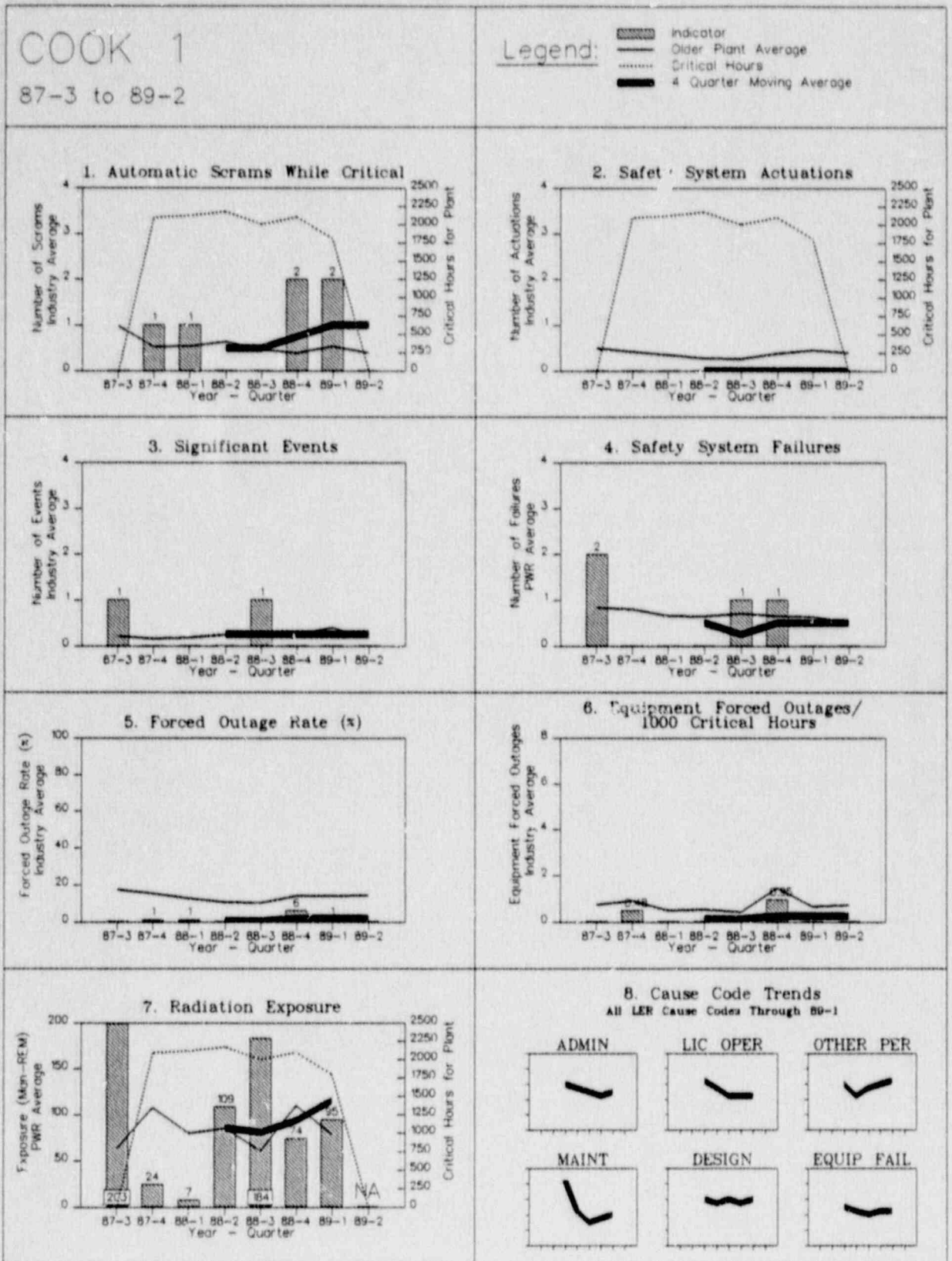
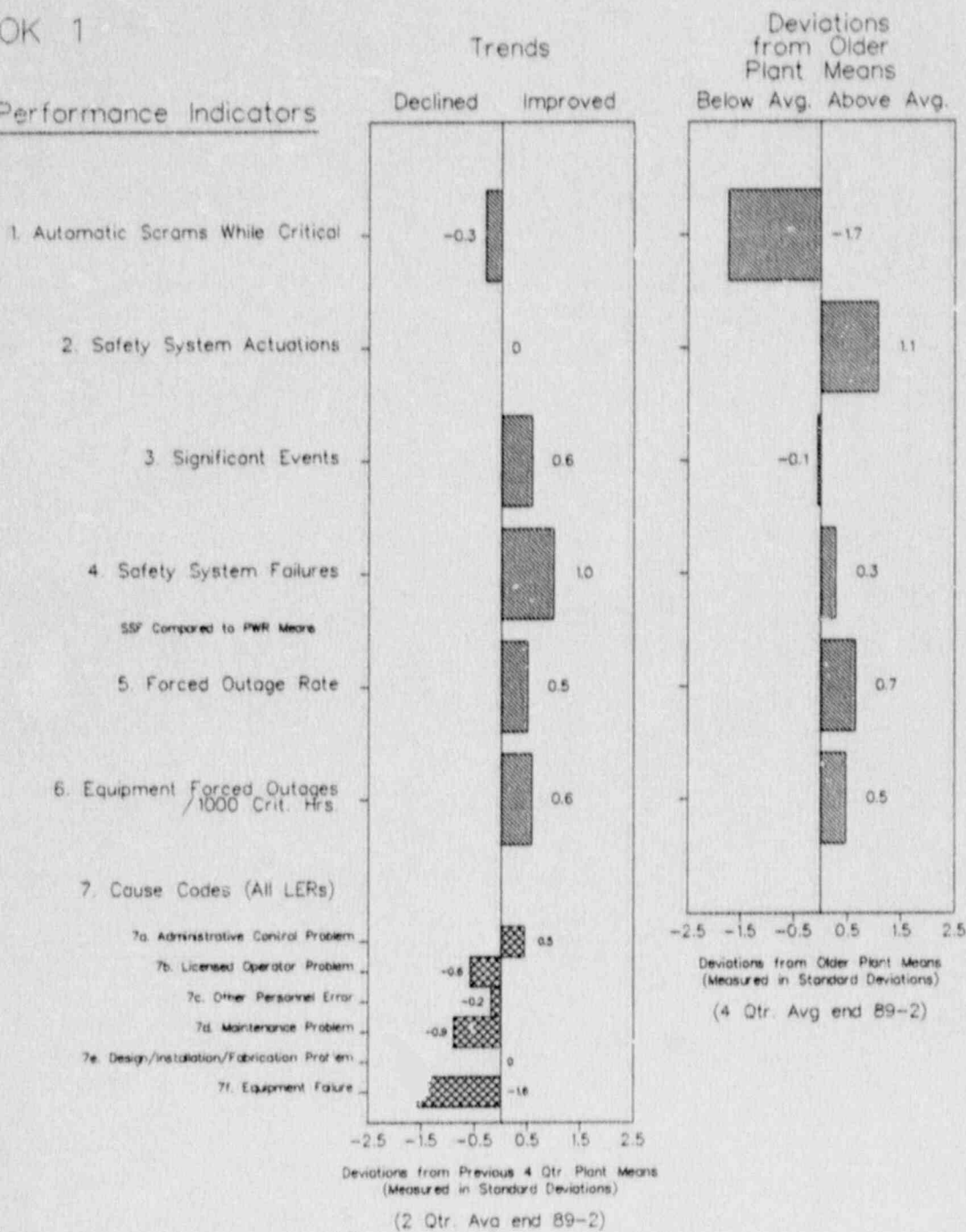


FIGURE 4.21

COOK 1

Performance Indicators



• NOTE: Cause Code Avgs end 89-1

FIGURE 4.22

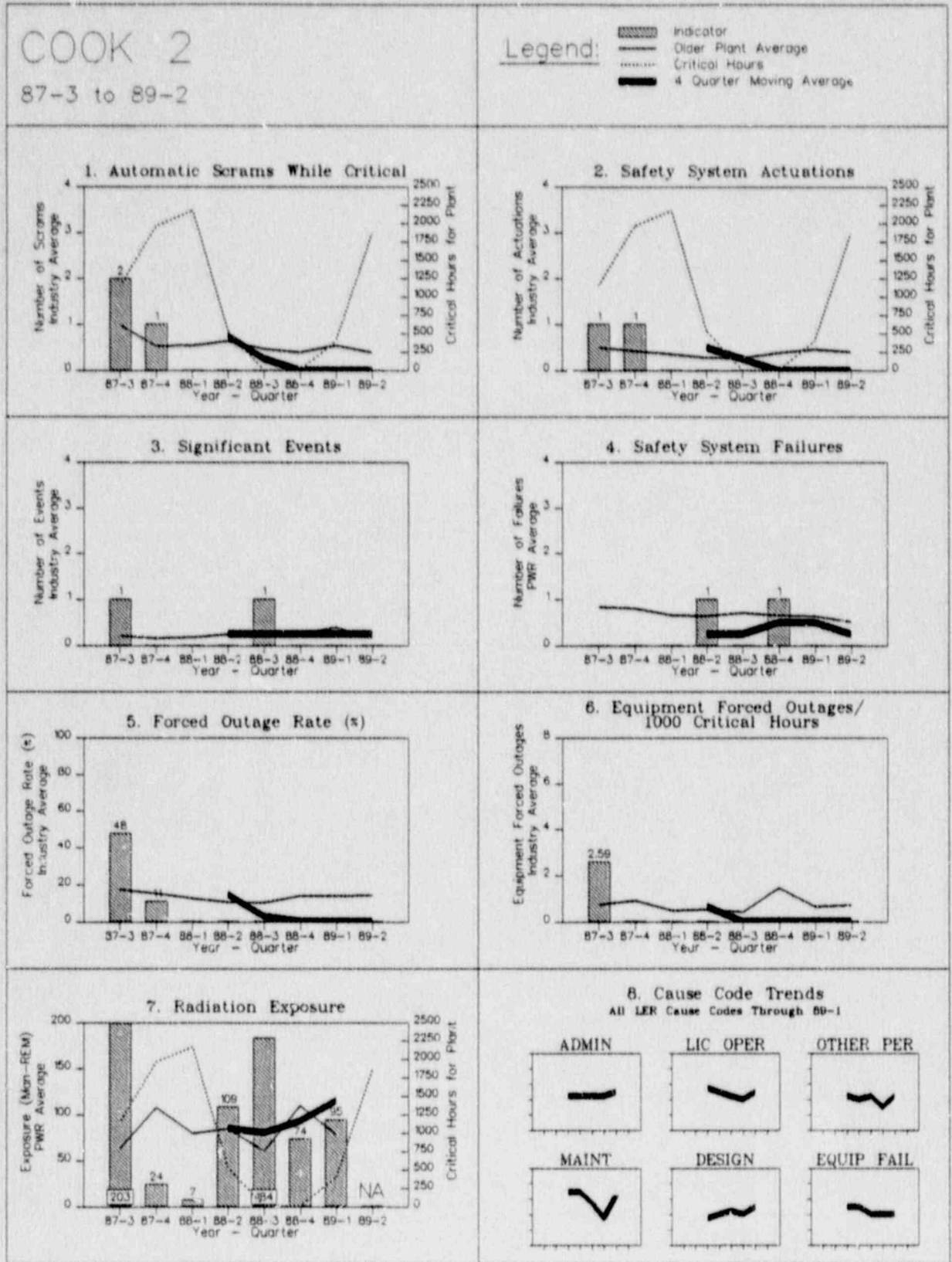


FIGURE 4.22

COOK 2

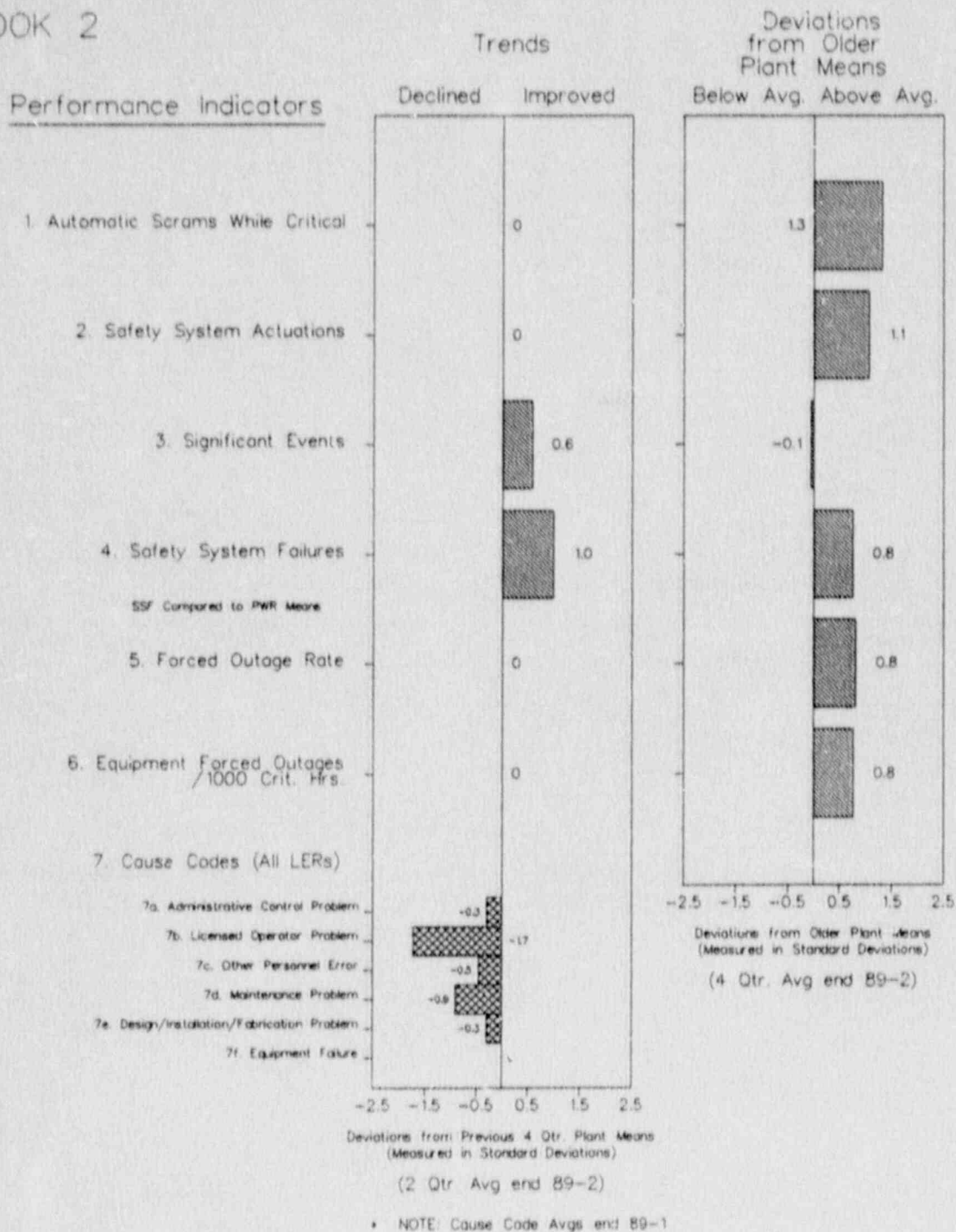


FIGURE 4.23

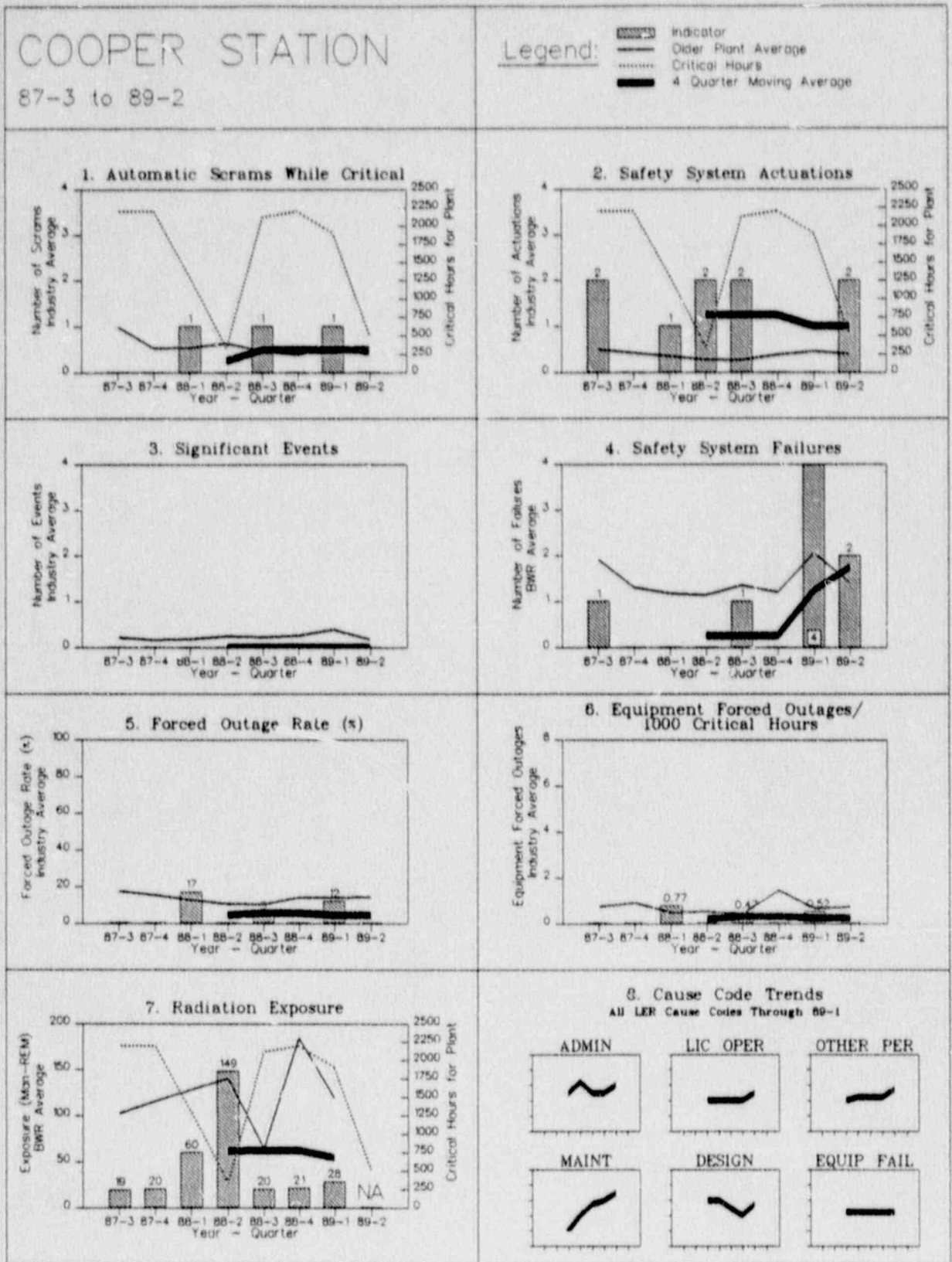




FIGURE 4.23

# COOPER STATION

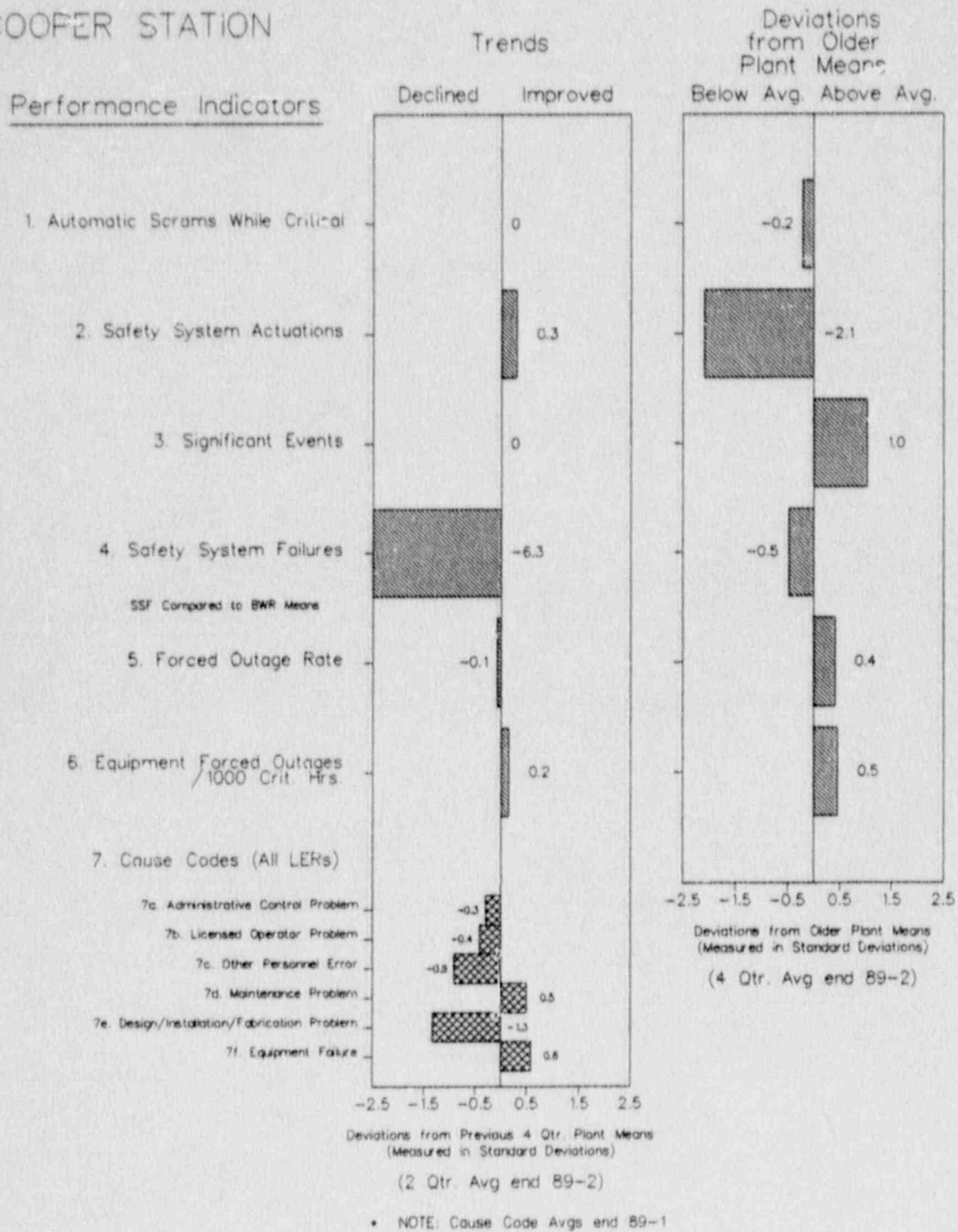


FIGURE 4.24

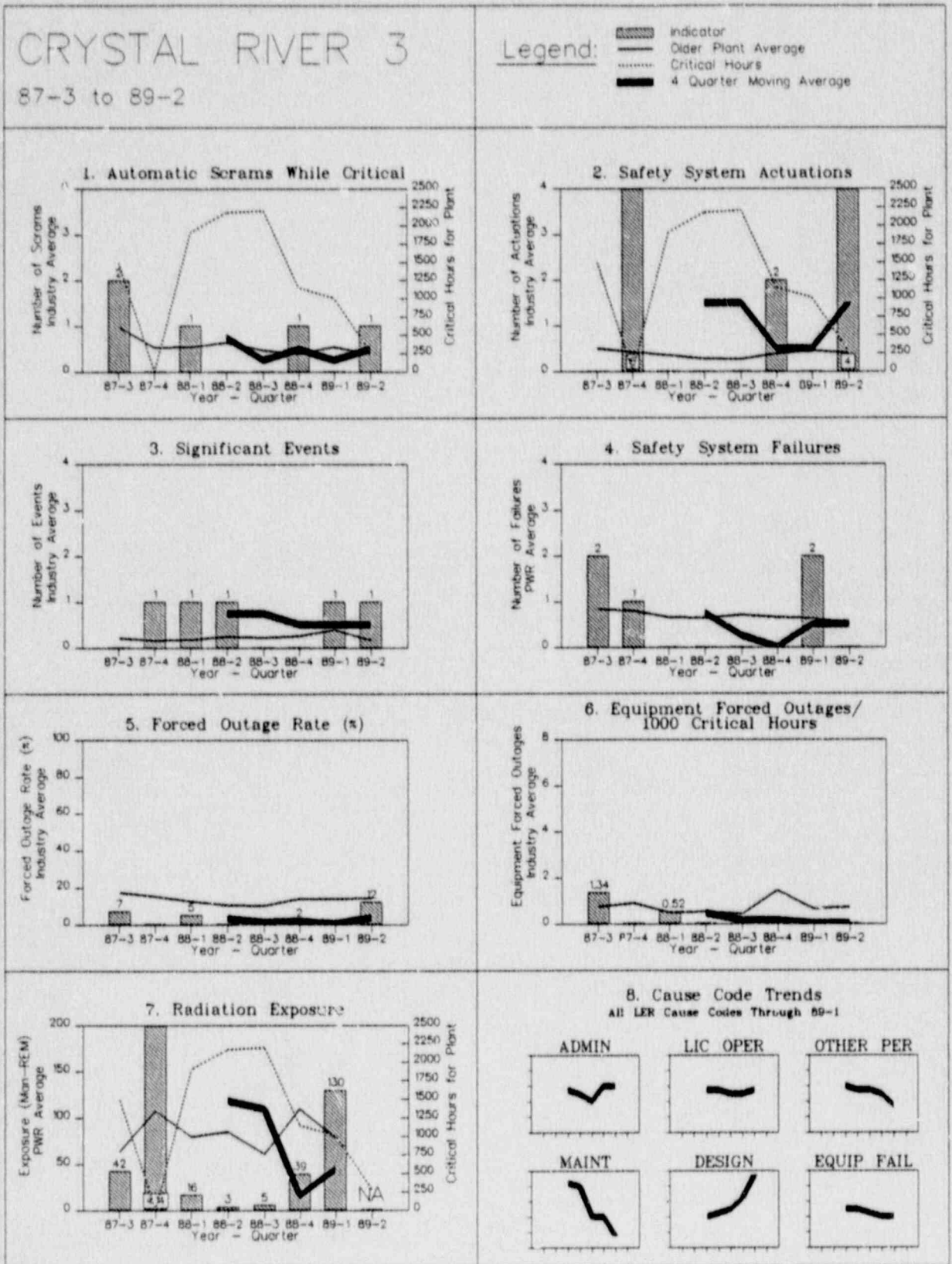


FIGURE 4.24

CRYSTAL RIVER 3

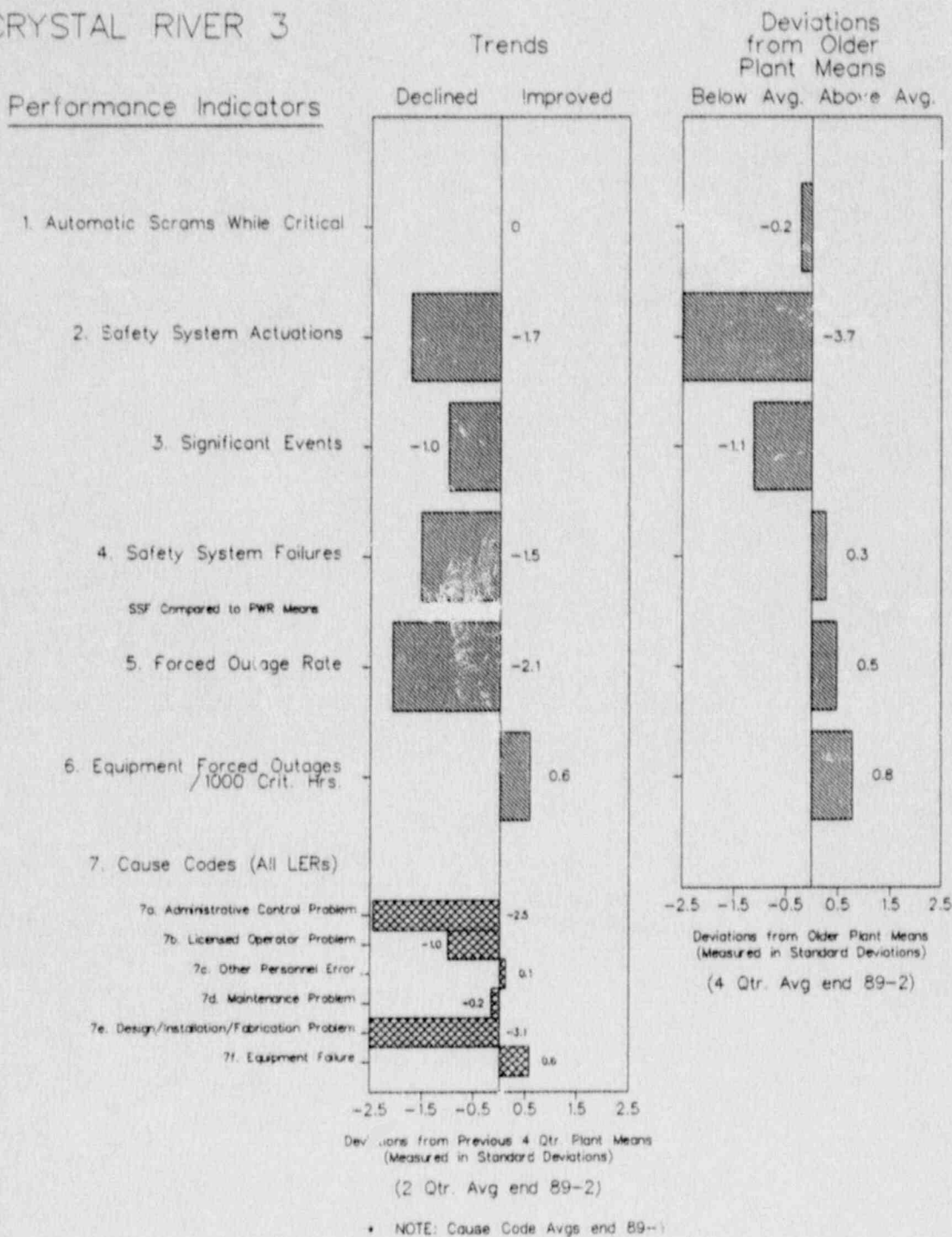


FIGURE 4.25

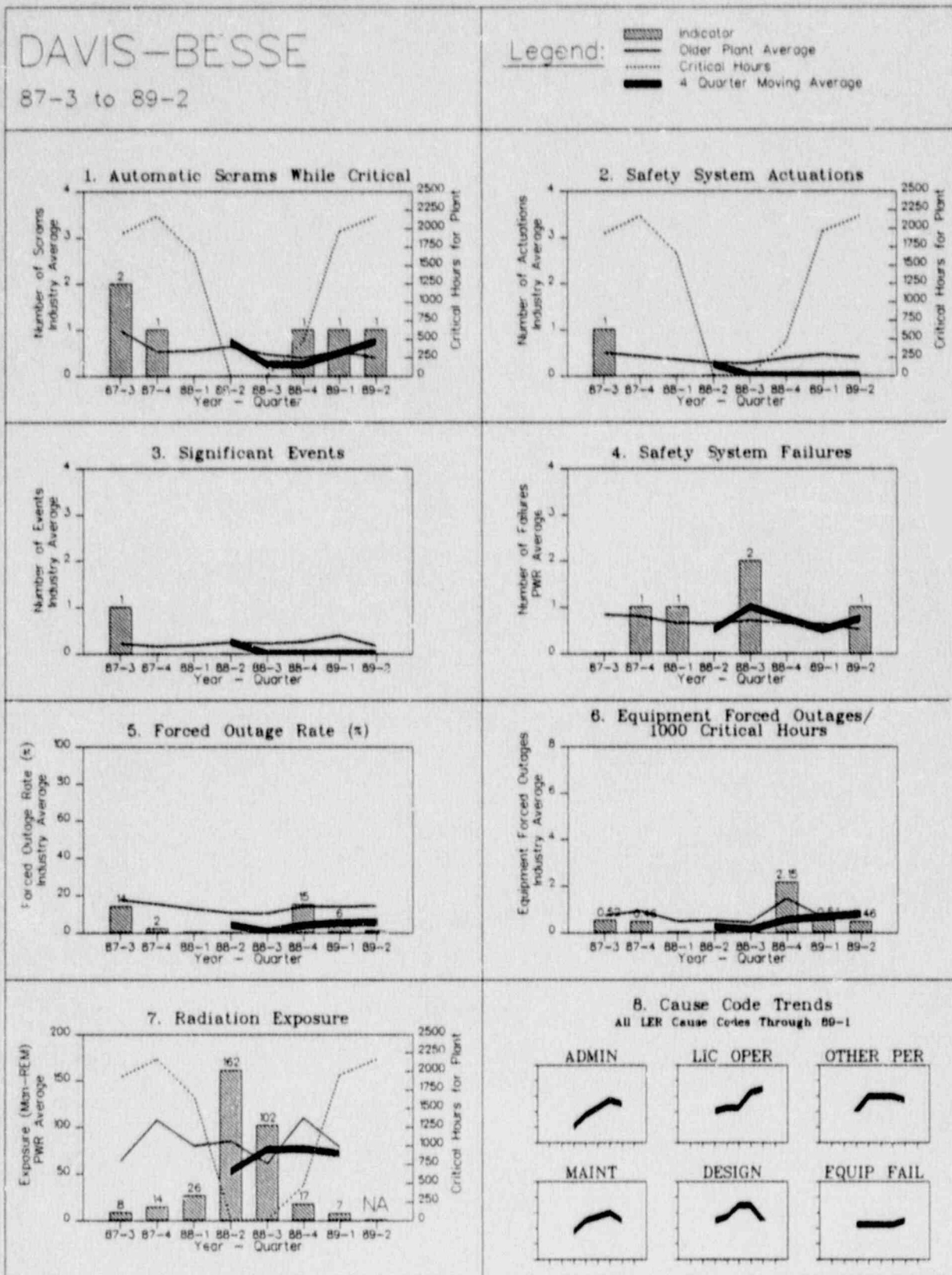
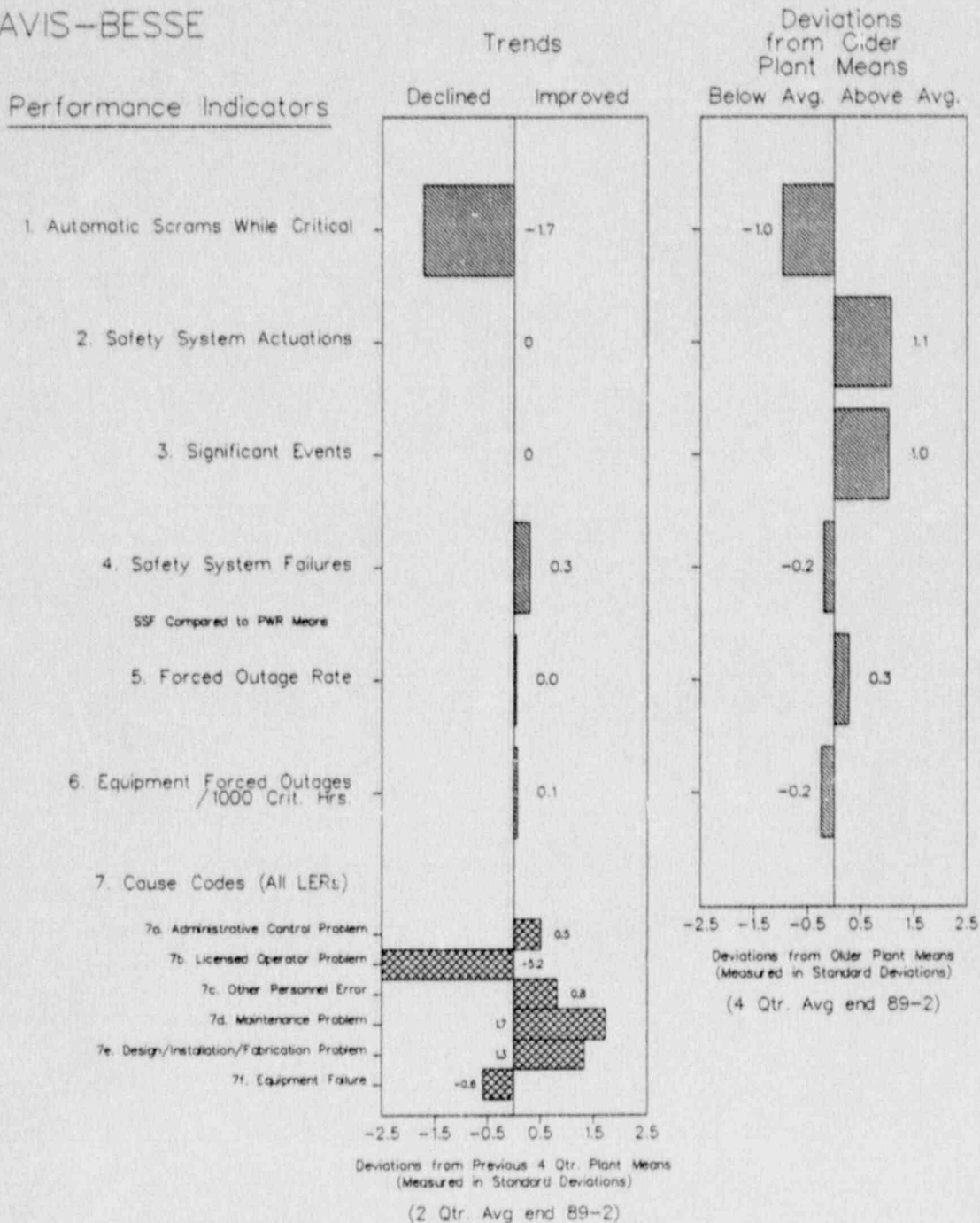


FIGURE 4.25

DAVIS-BESSE



• NOTE: Cause Code Avgs end 89-1

FIGURE 4.26

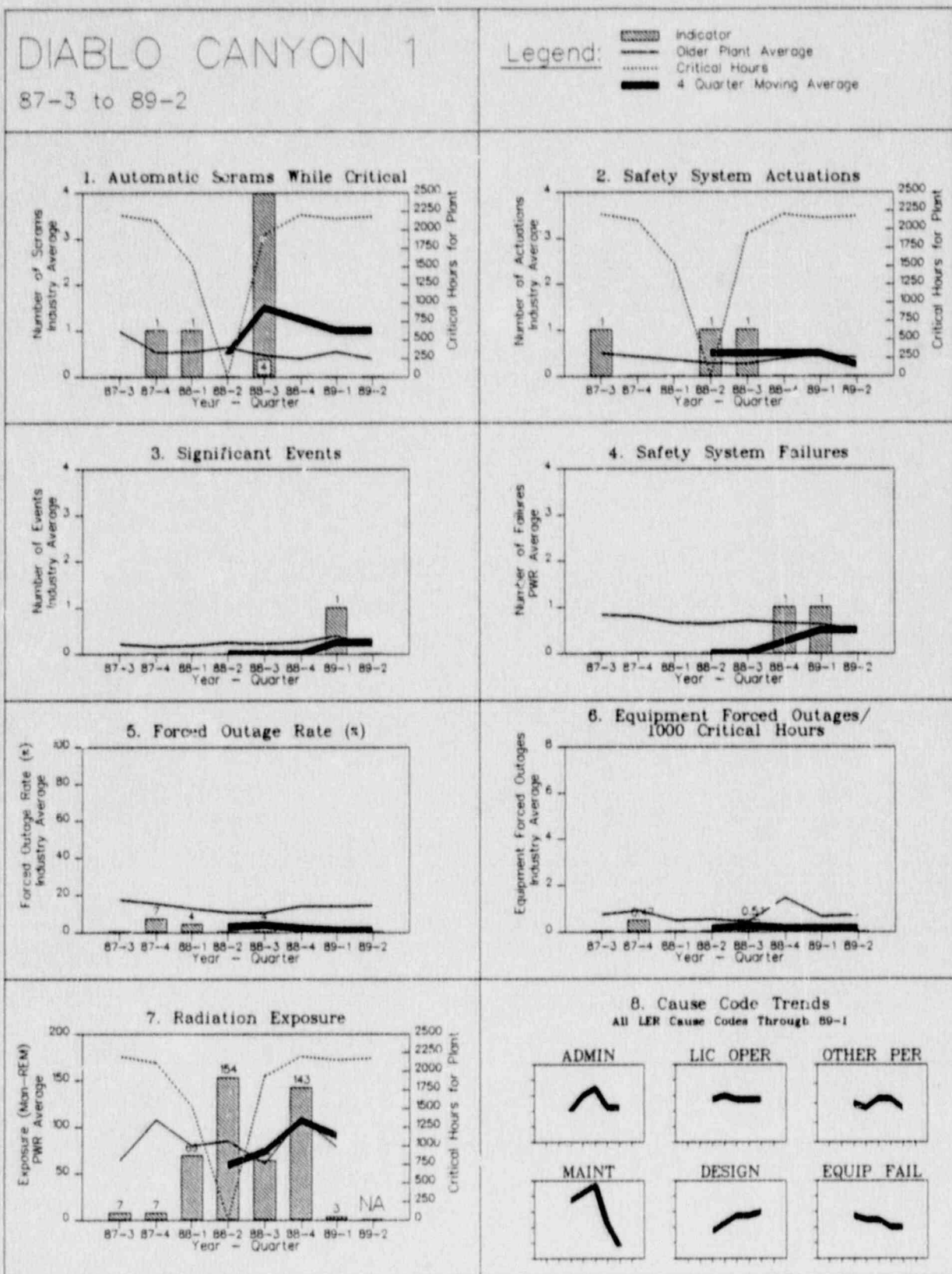


FIGURE 4.26

# DIABLO CANYON 1

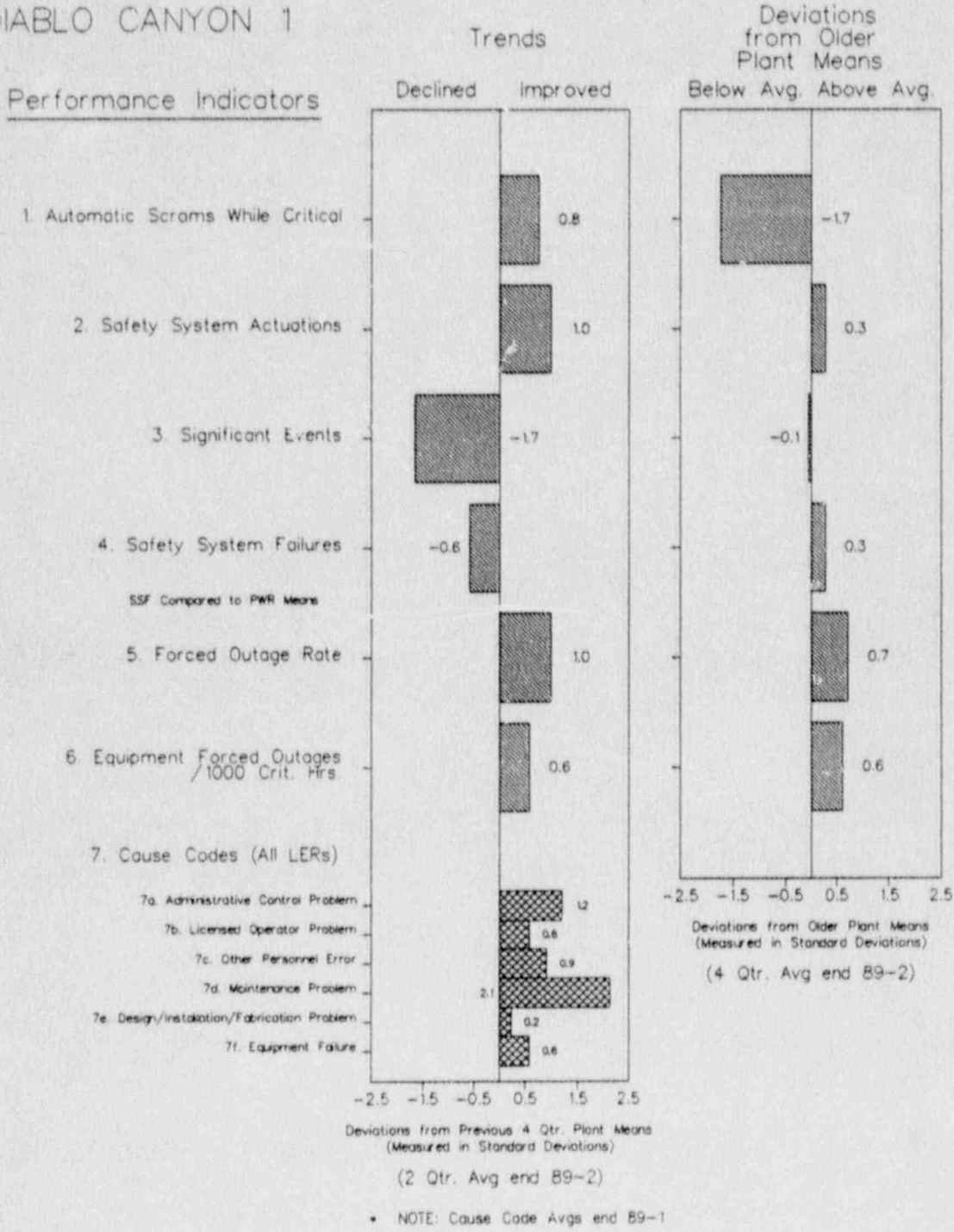


FIGURE 4.27

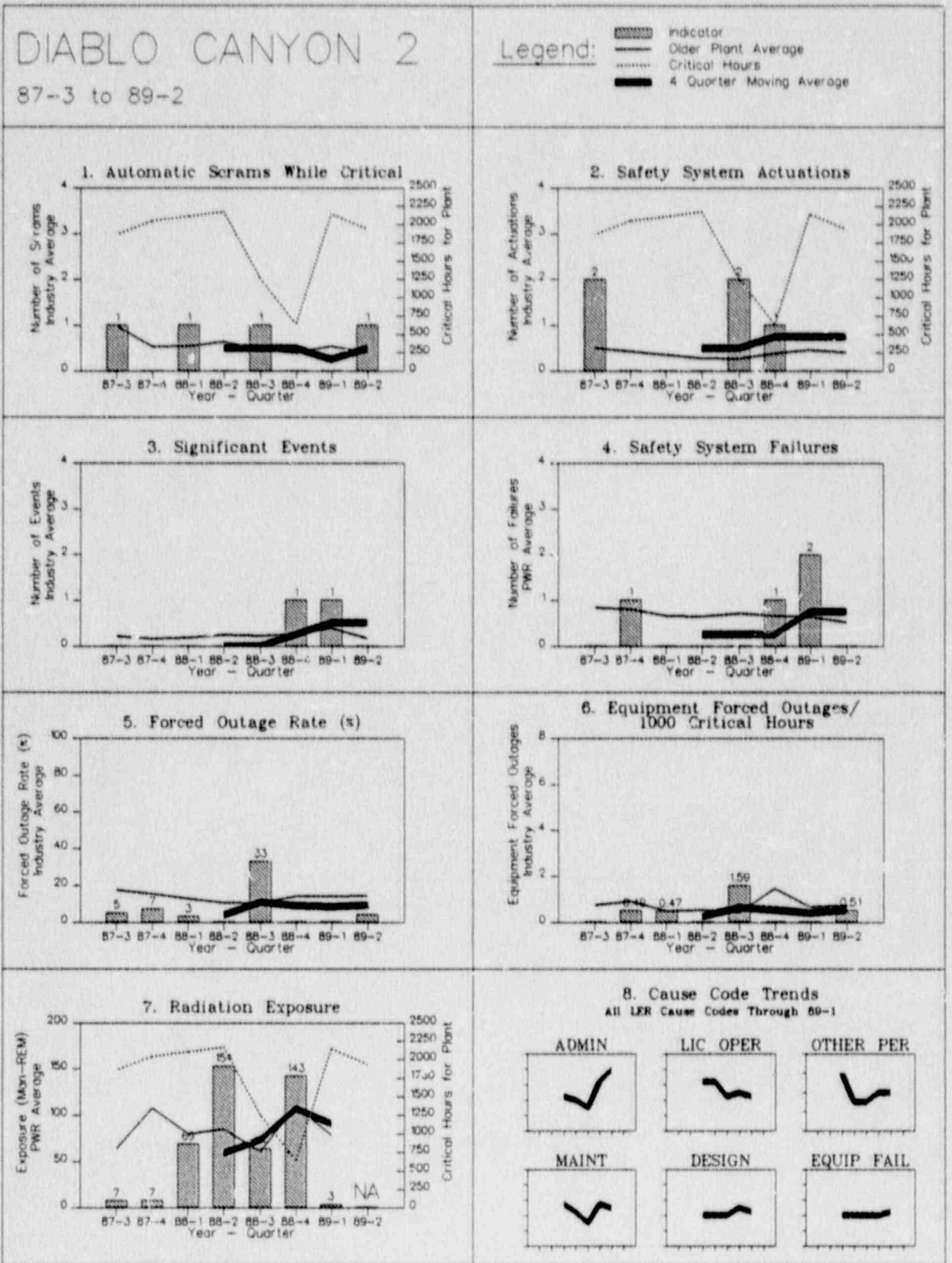
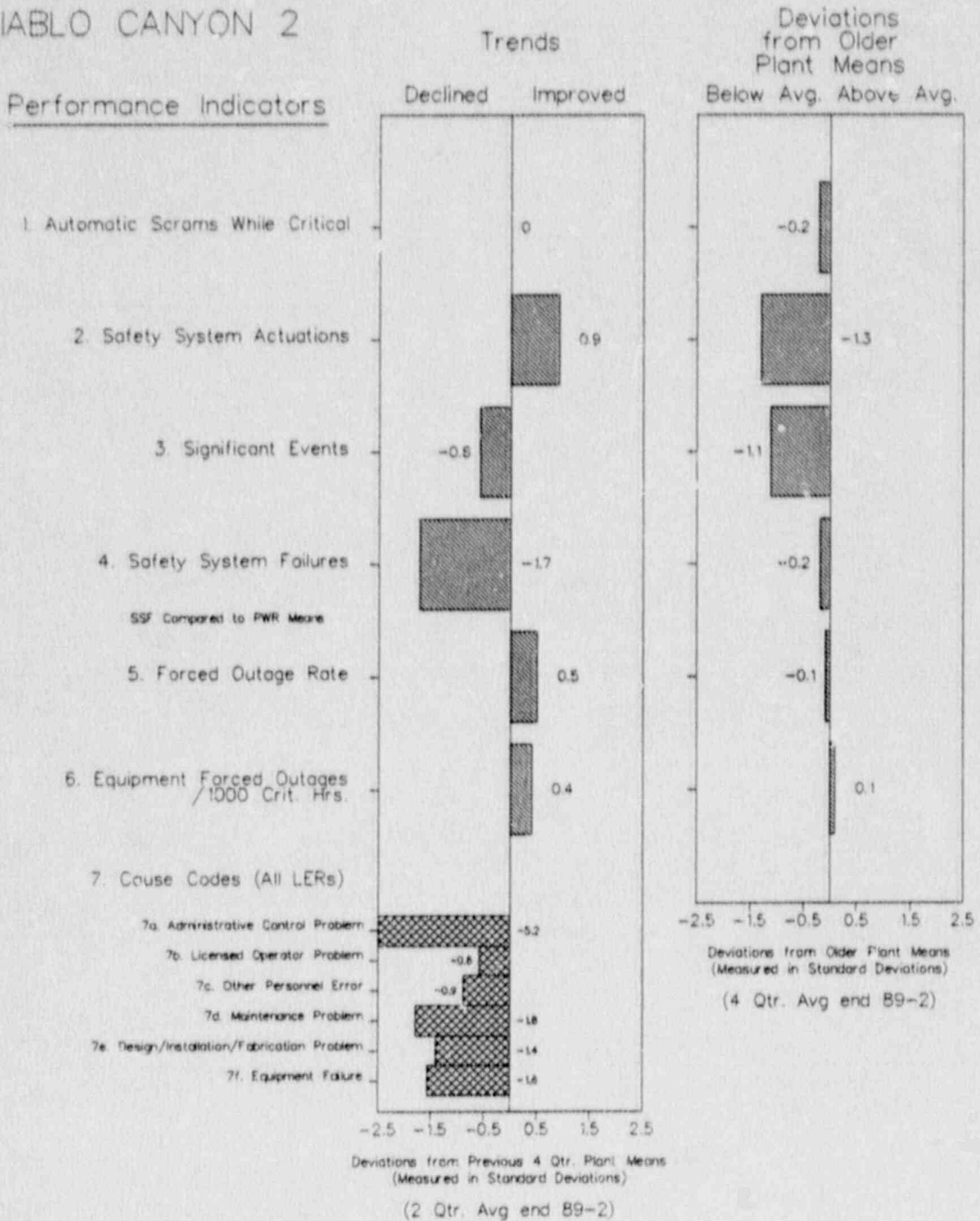




FIGURE 4.27

# DIABLO CANYON 2



\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.28

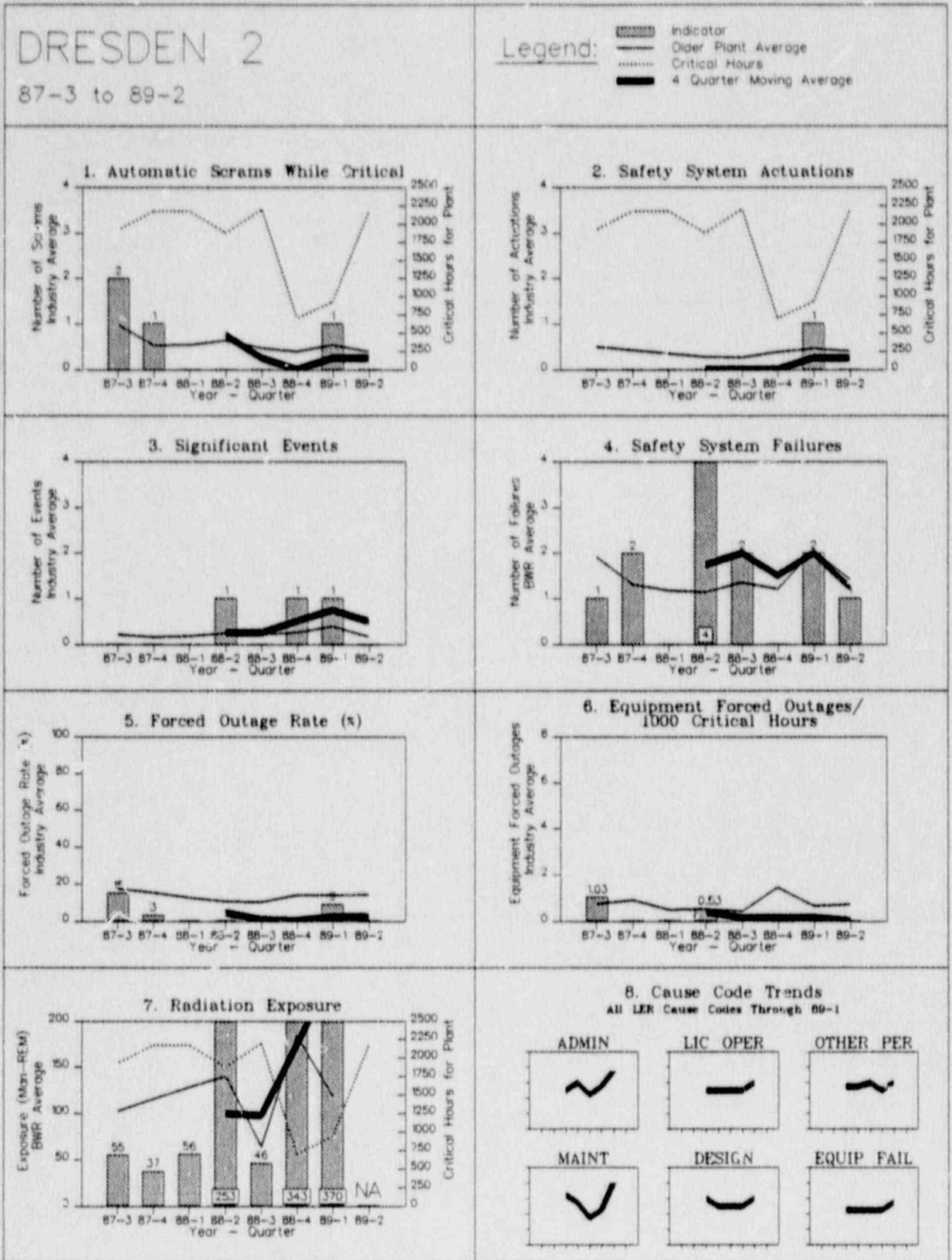


FIGURE 4.28

DRESDEN 2

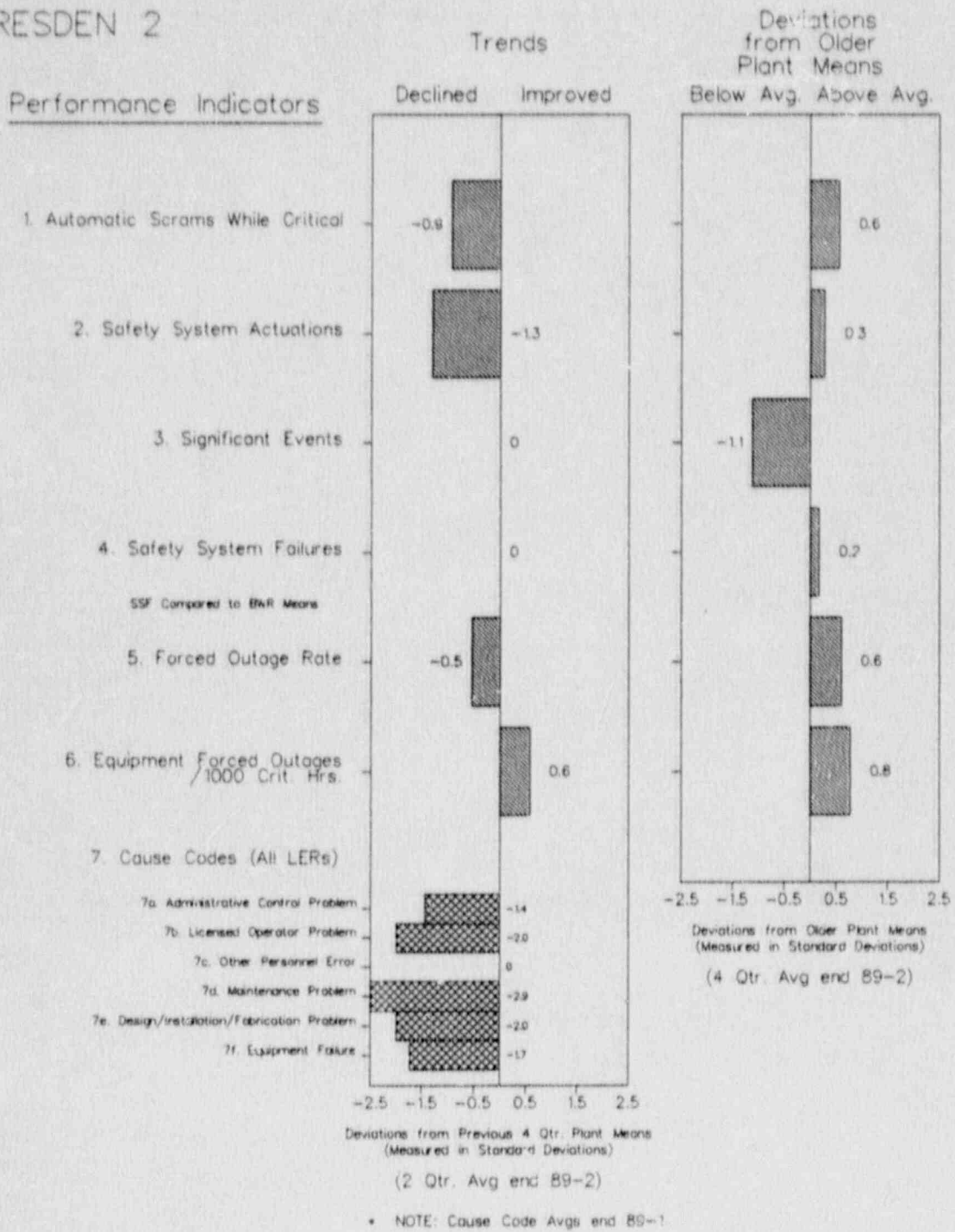


FIGURE 4.29

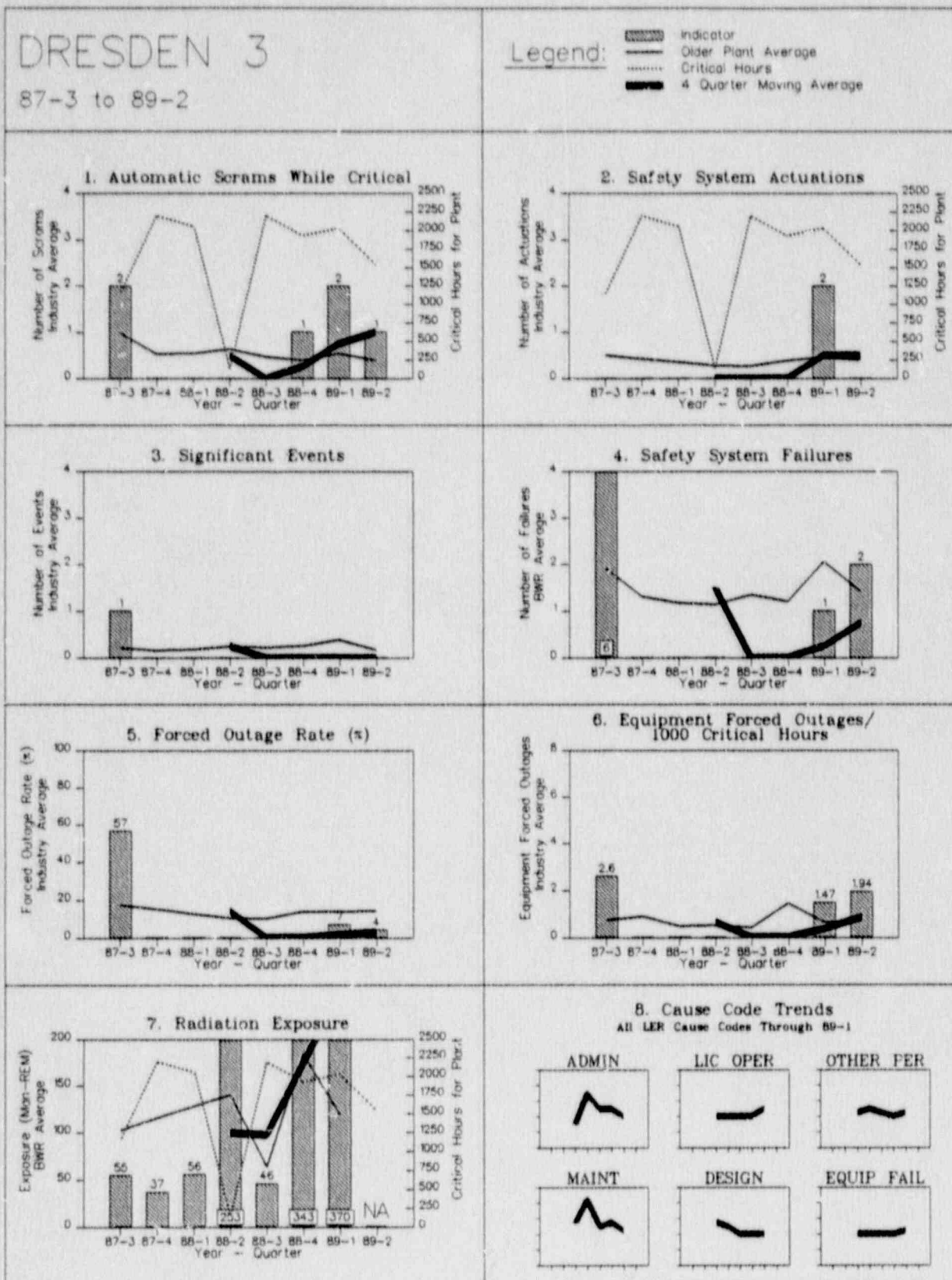
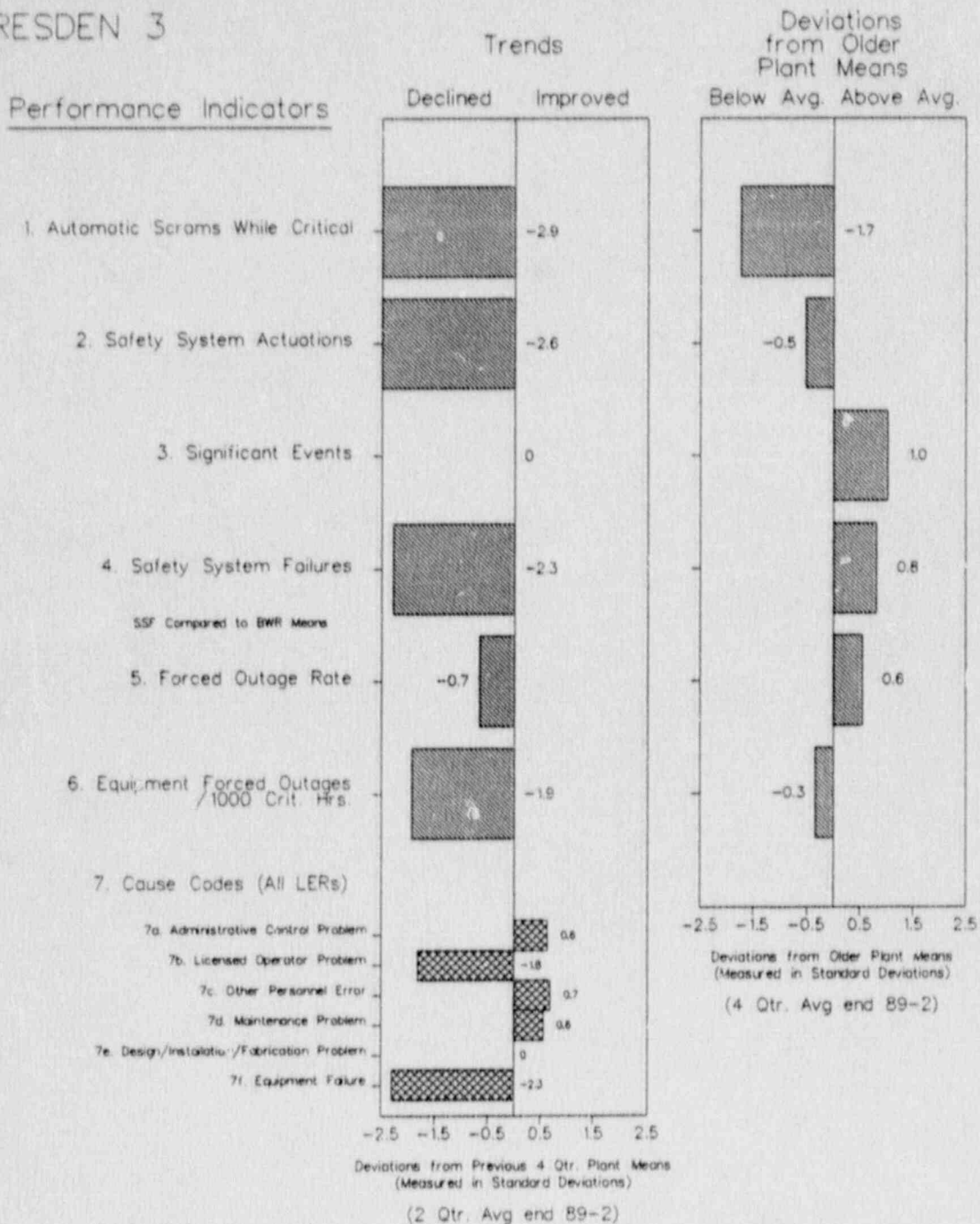


FIGURE 4.29

DRESDEN 3



\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.30

# DUANE ARNOLD

87-3 to 89-2

## Legend:

- Indicator
- Older Plant Average
- Critical Hours
- 4 Quarter Moving Average

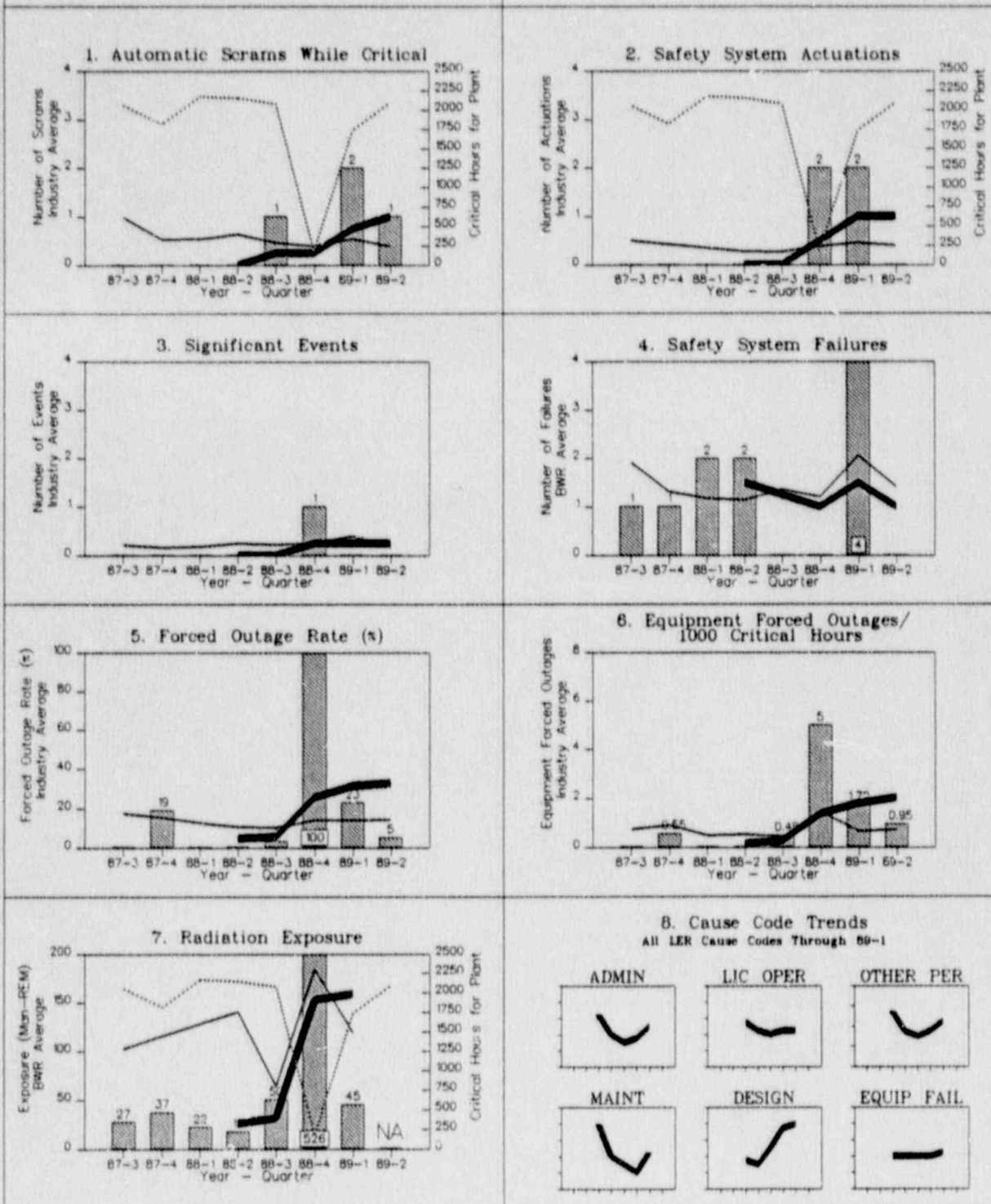


FIGURE 4.30

DUANE ARNOLD

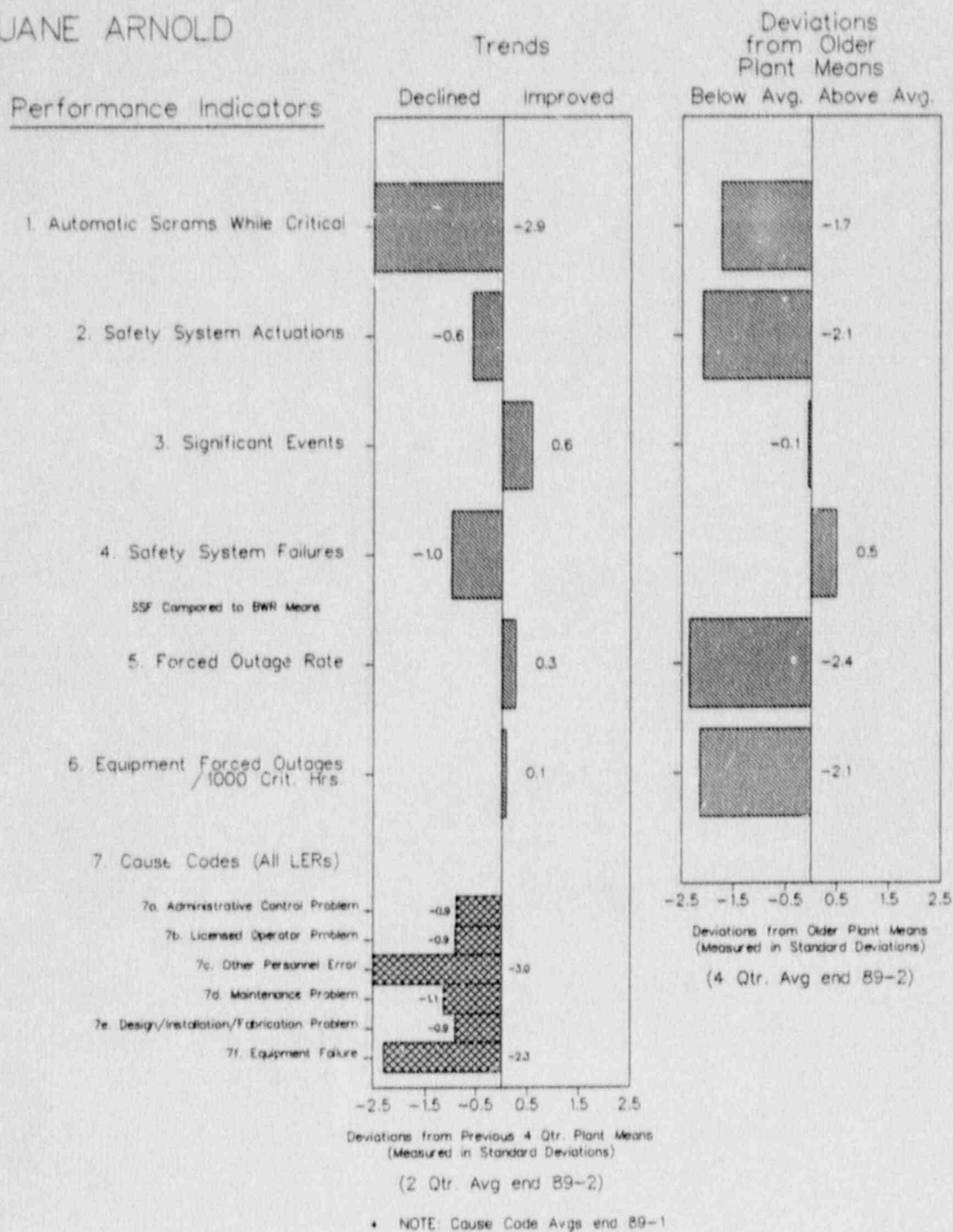


FIGURE 4.31

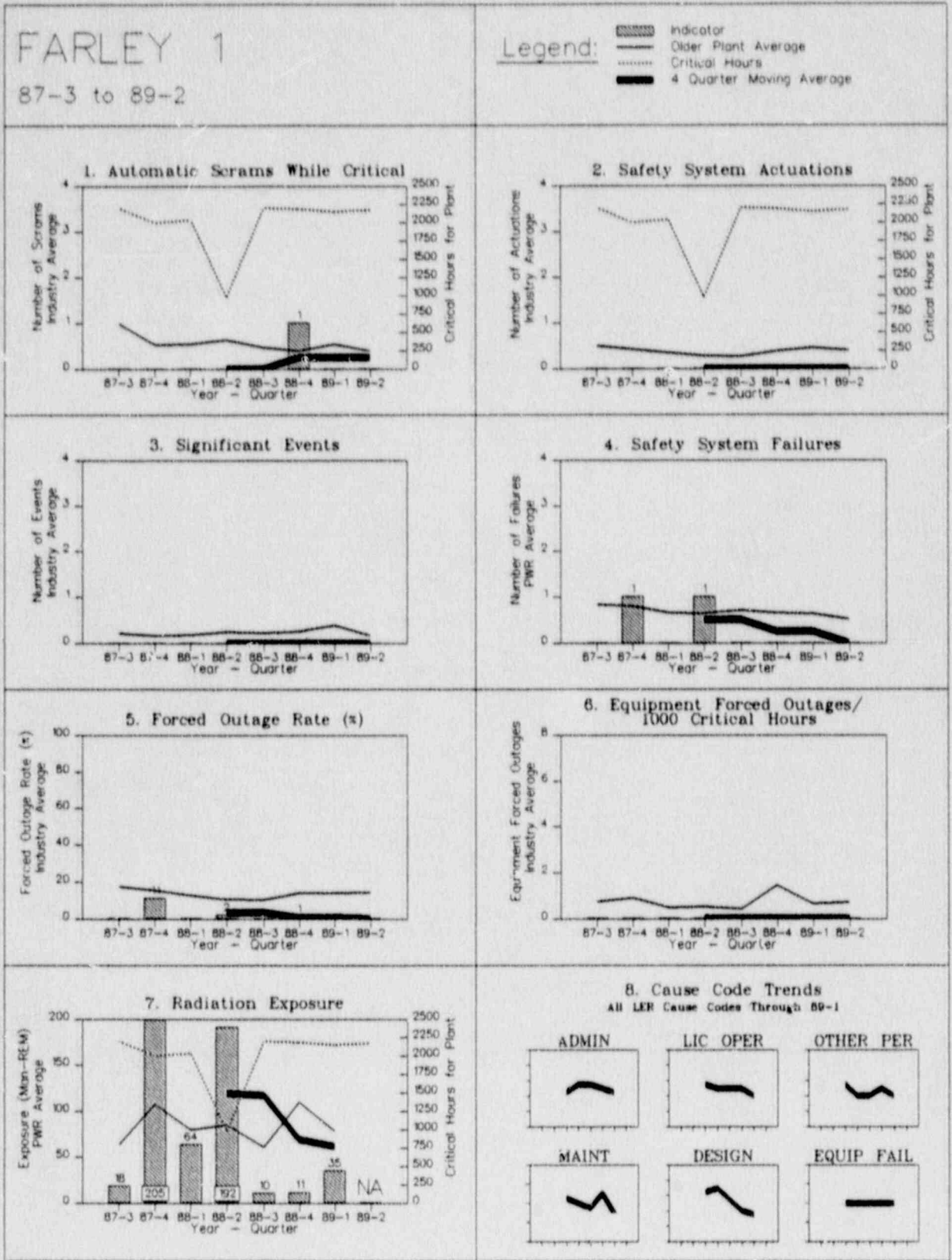
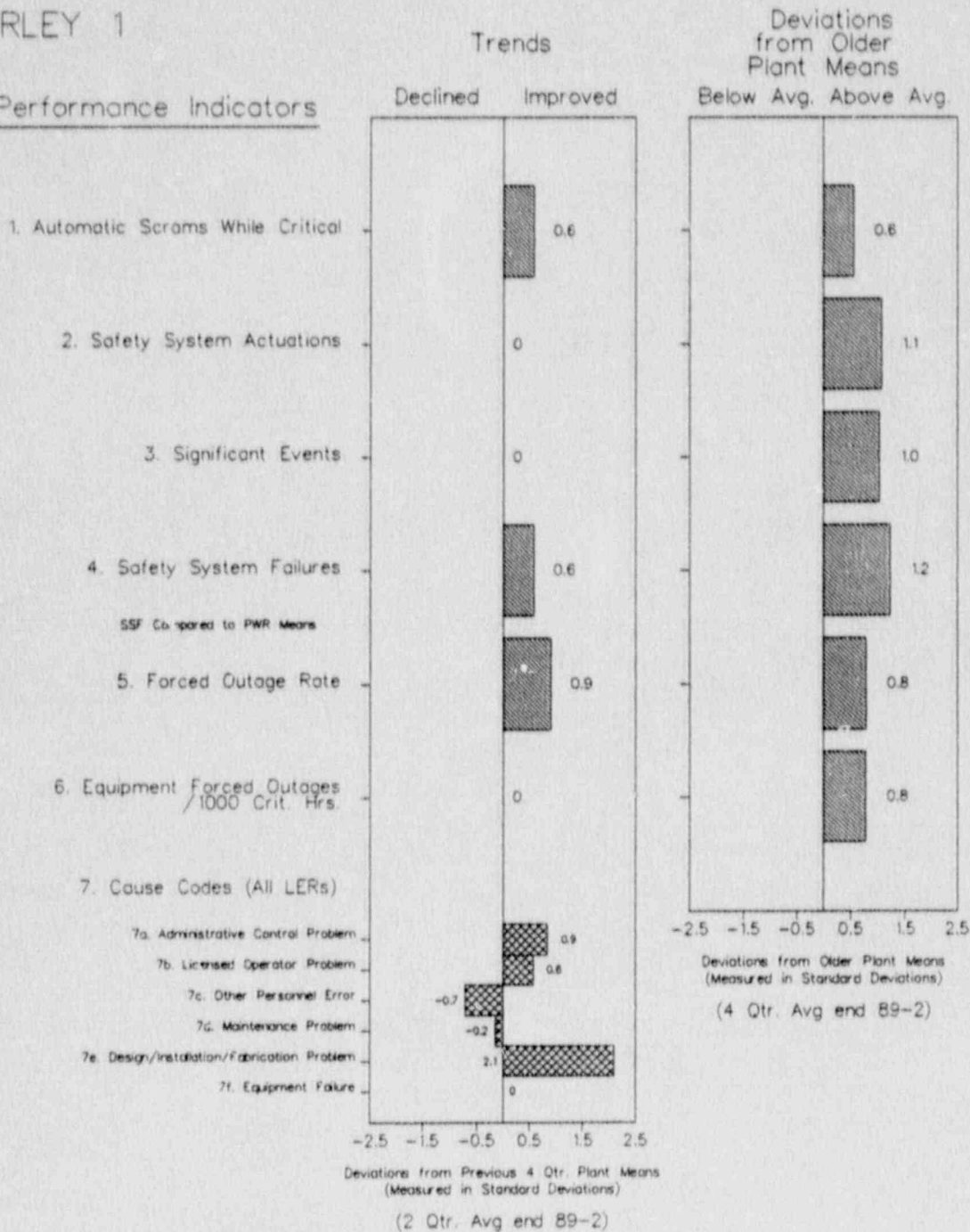




FIGURE 4.31

FARLEY 1

Performance Indicators



\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.32

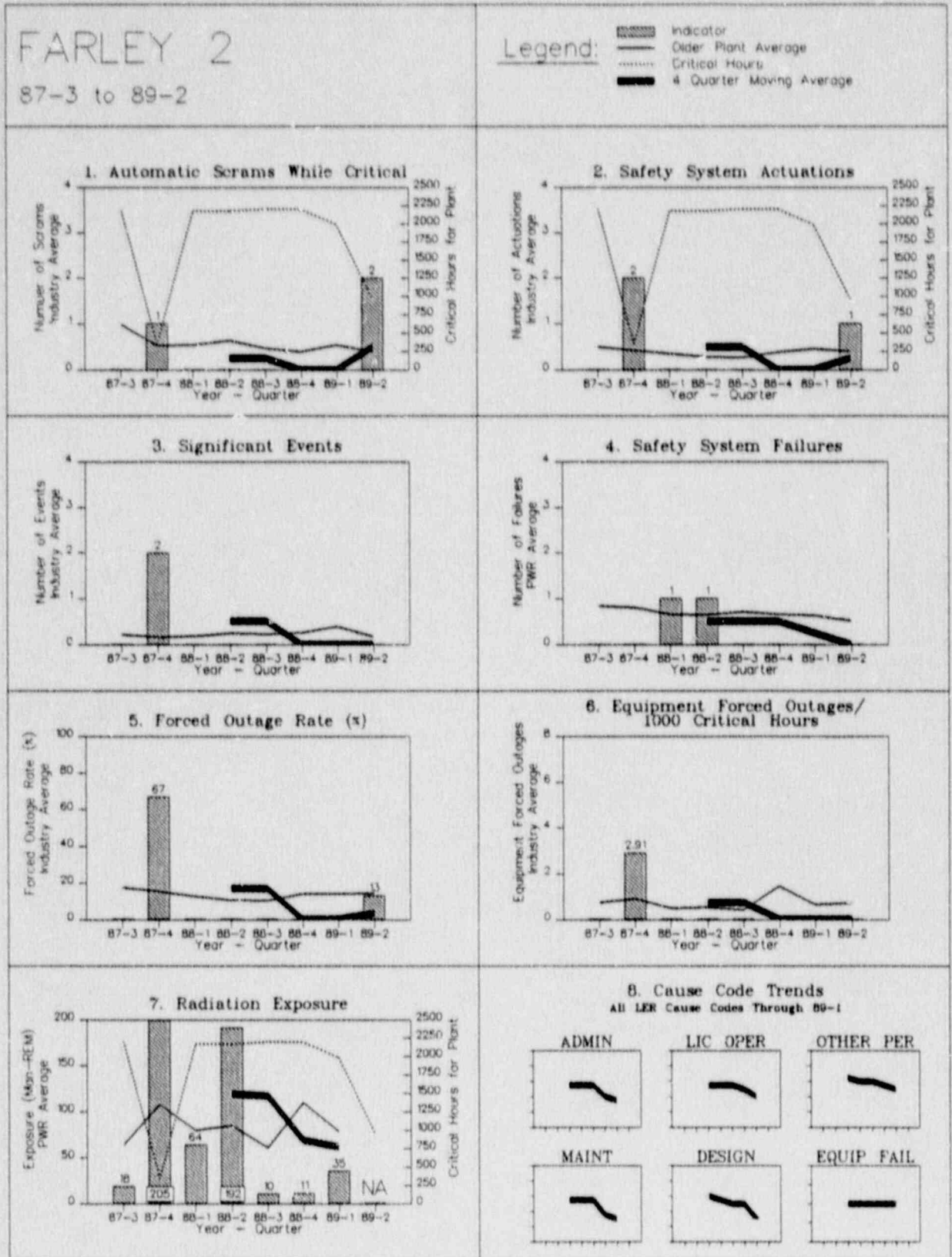


FIGURE 4.32

FARLEY 2

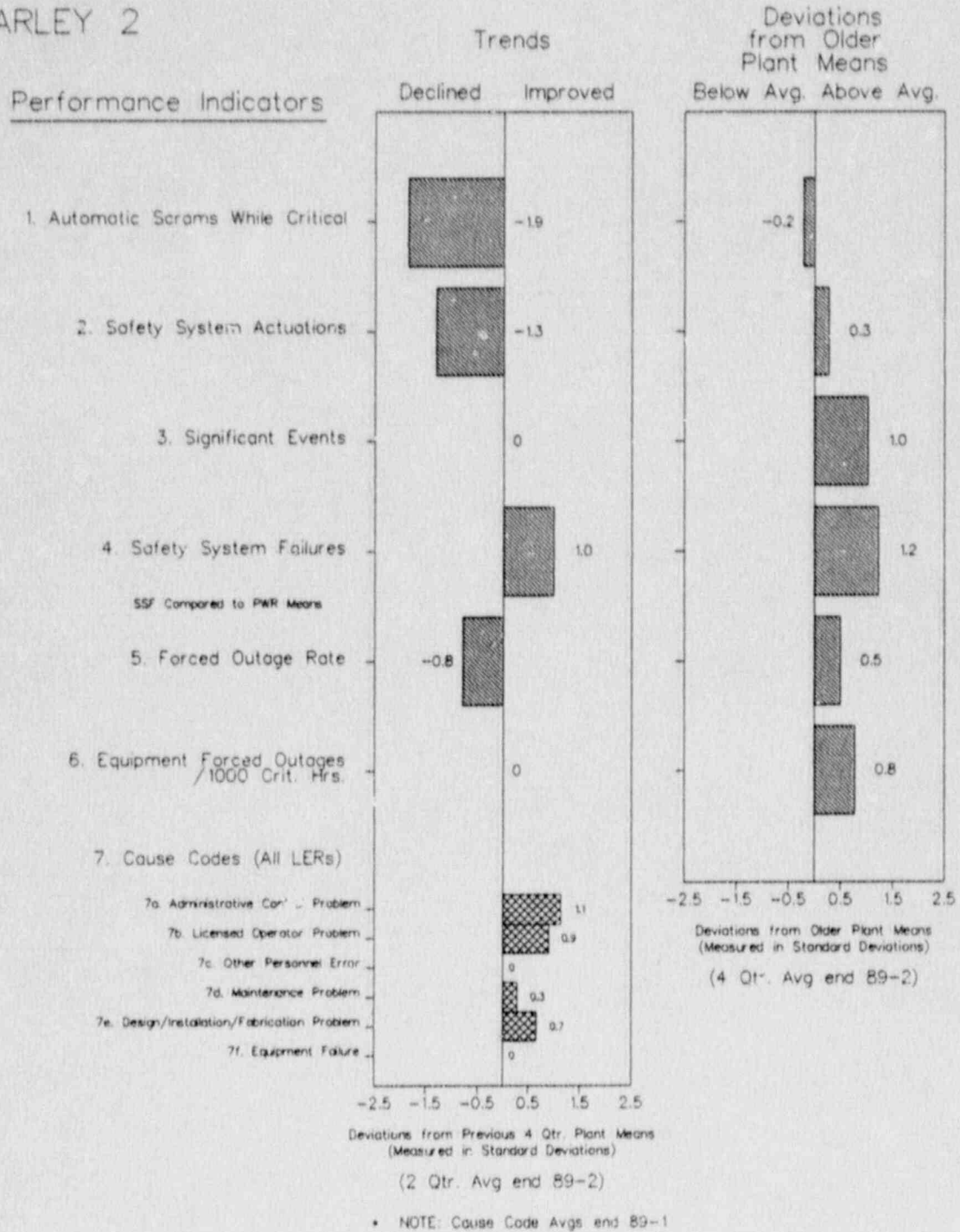


FIGURE 4.33

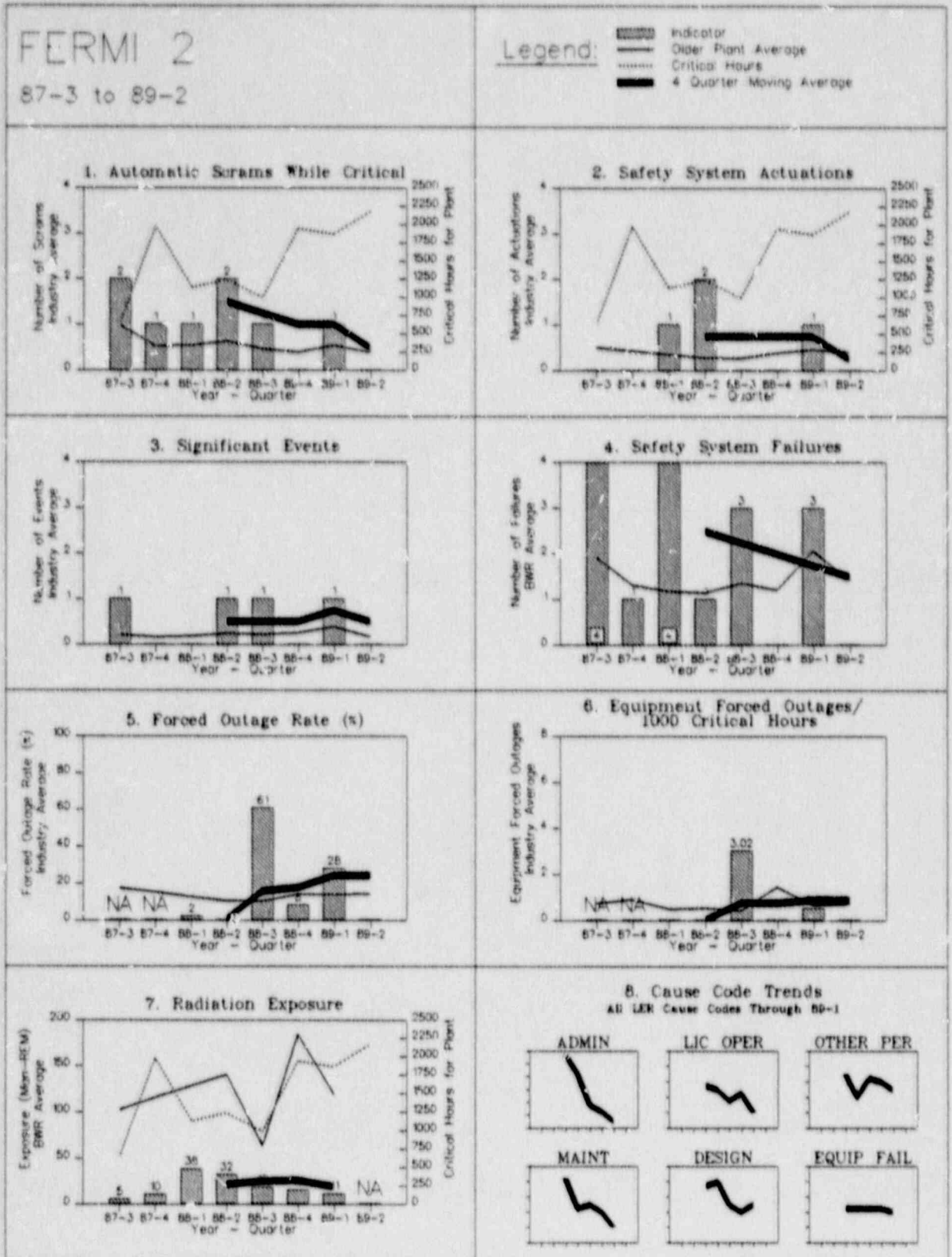


FIGURE 4.33

FERMI 2

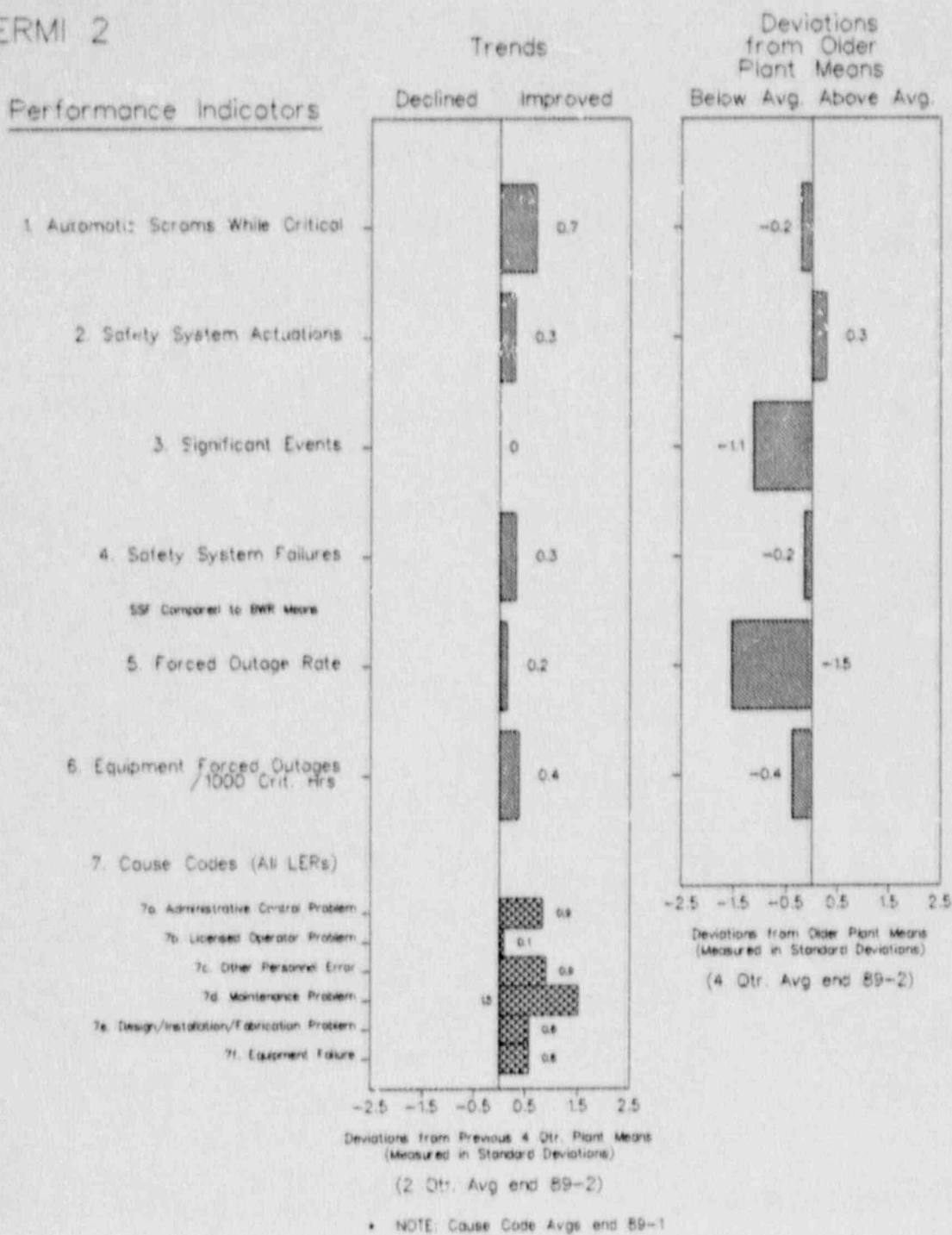


FIGURE 4.34

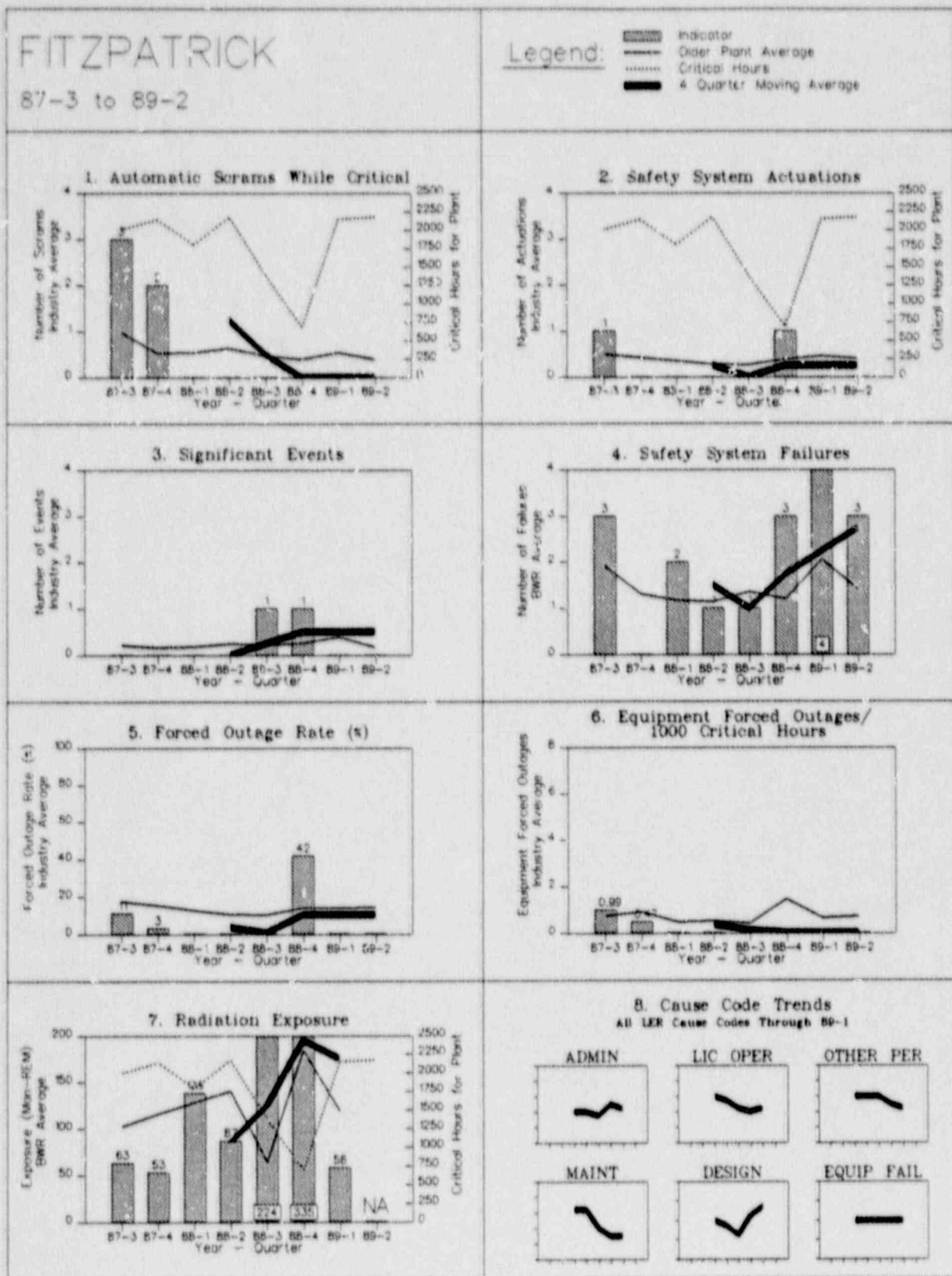


FIGURE 4.34

FITZPATRICK

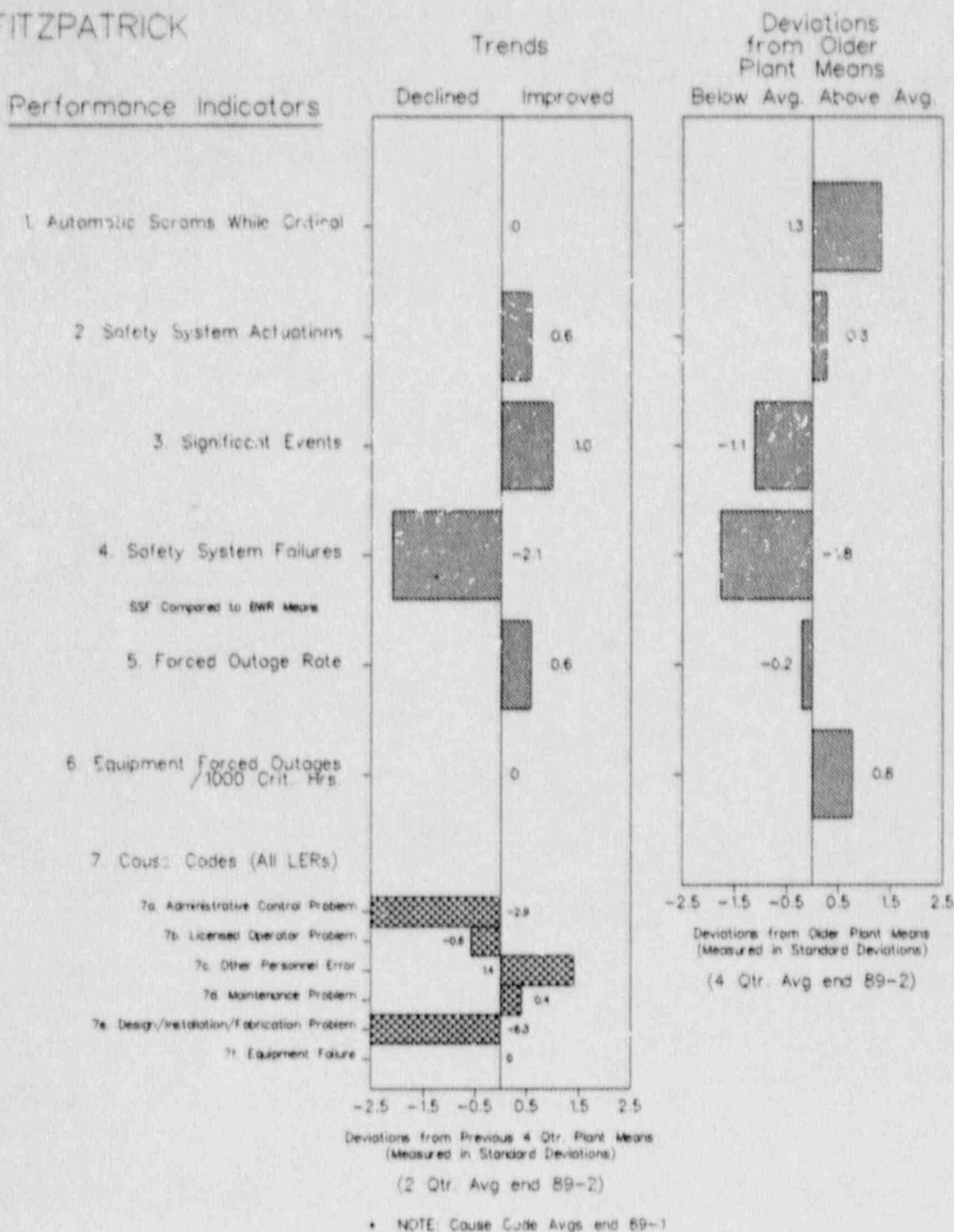


FIGURE 4.35

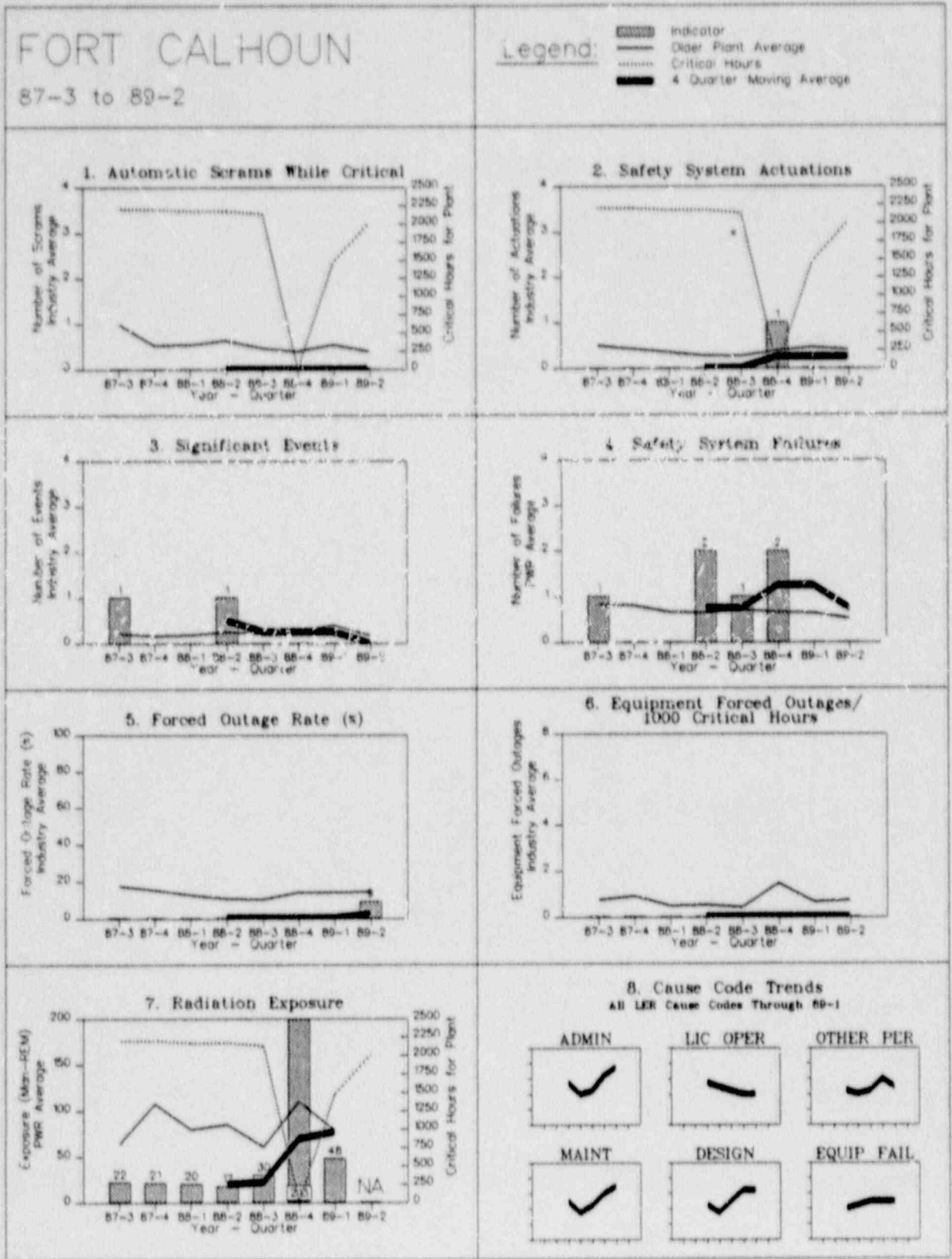




FIGURE 4.35

FORT CALHOUN

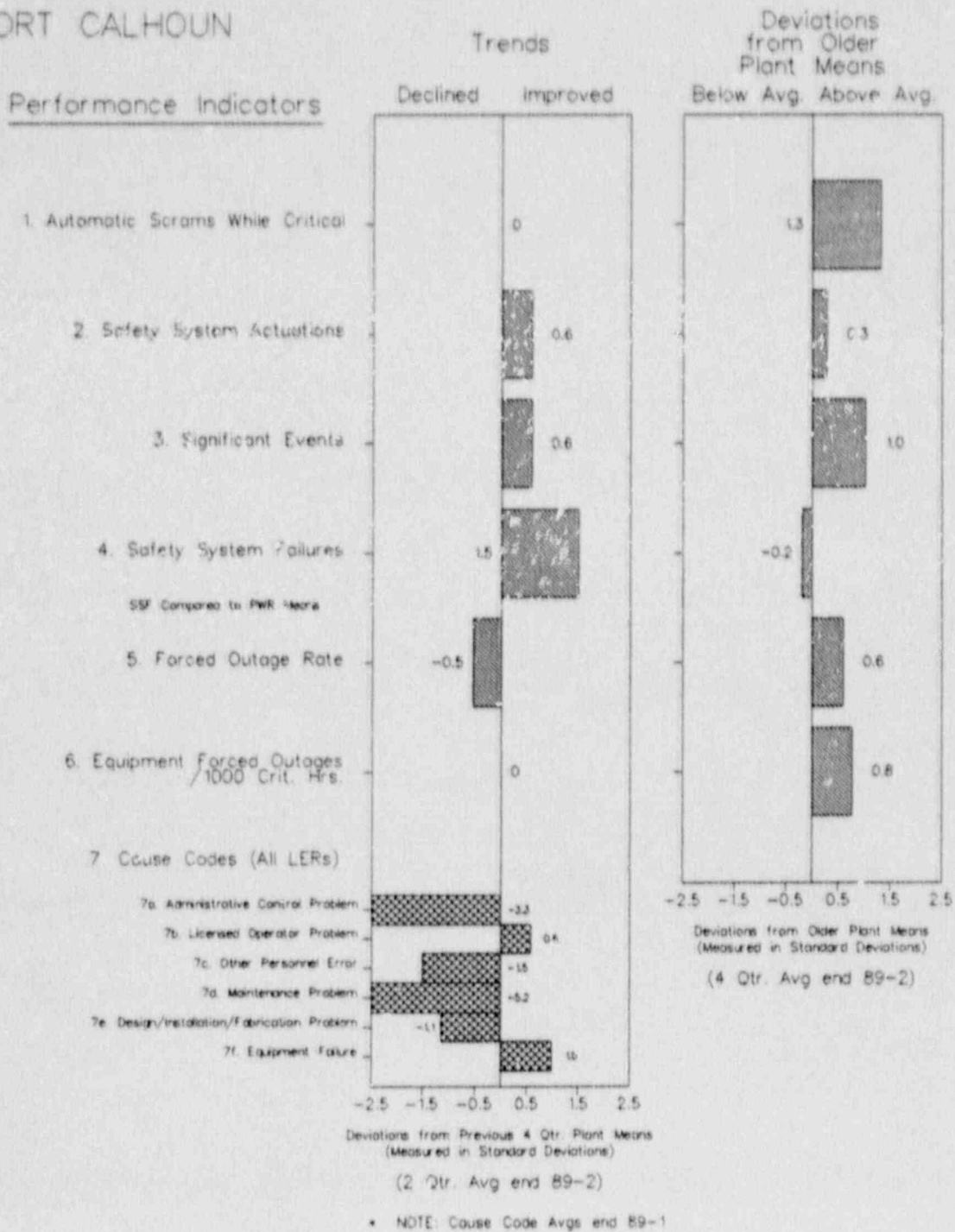


FIGURE 4.36

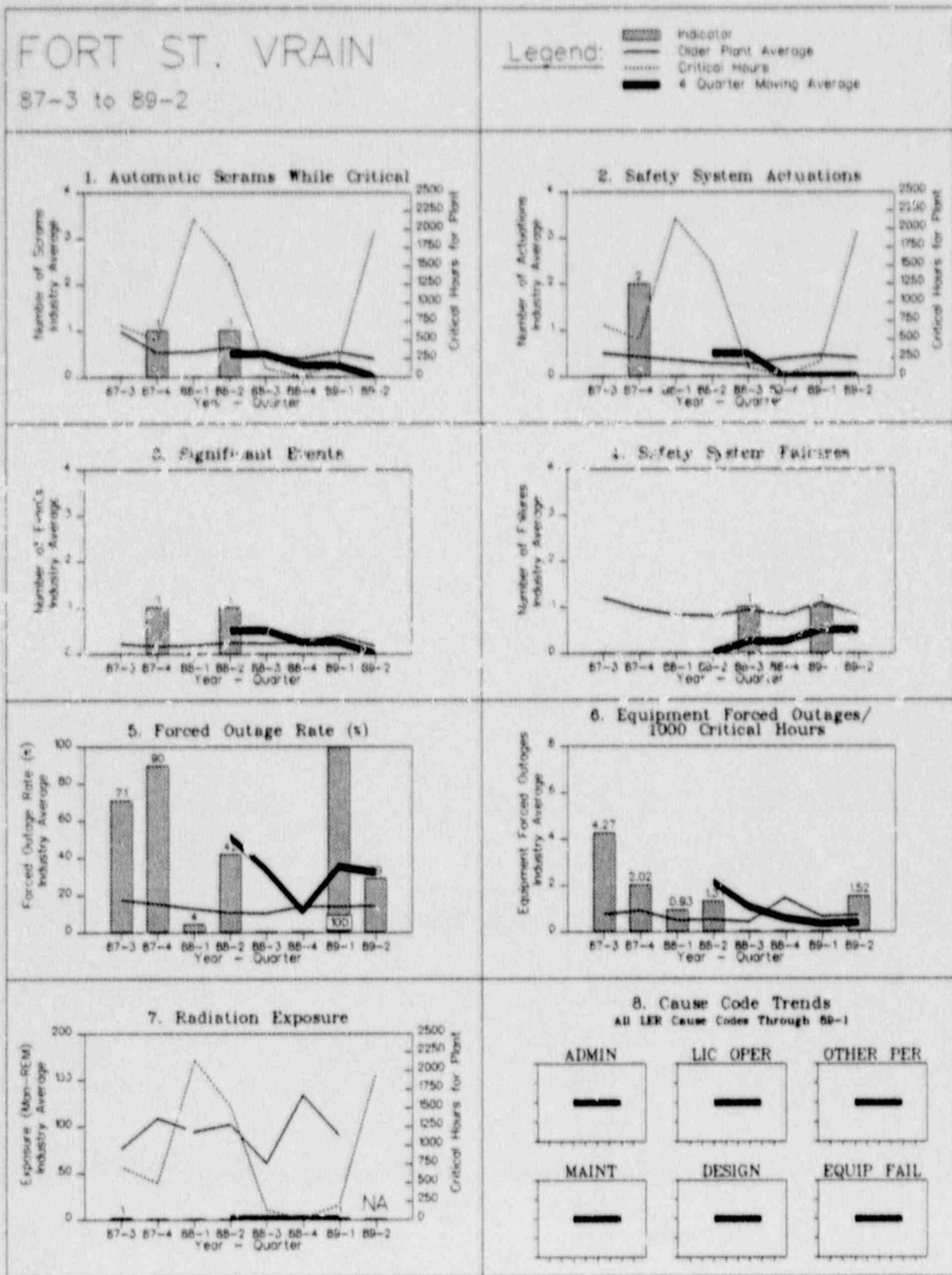


FIGURE 4.36

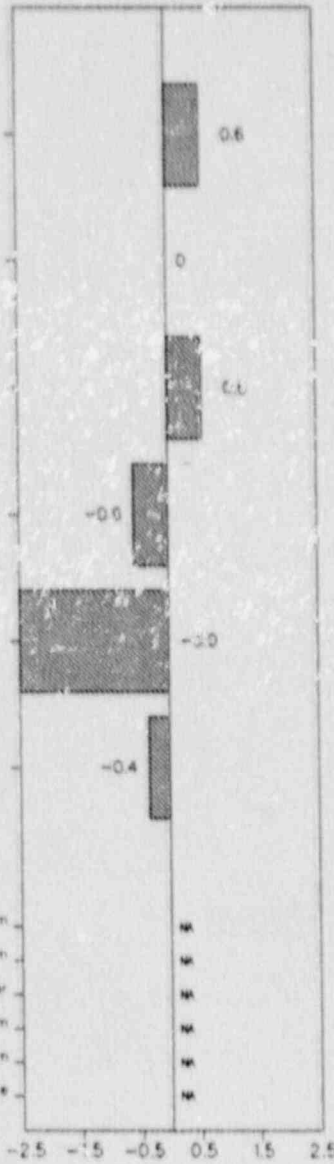
# FORT ST. VRAIN

## Performance Indicators

- 1. Automatic Scrams While Critical
- 2. Safety System Actuations
- 3. Significant Events
- 4. Safety System Failures
- 5. Forced Outage Rate
- 6. Equipment Forced Outages / 1000 Crit. Hrs.
- 7. Cause Codes (All LERs)
  - 7a. Administrative Control Problem
  - 7b. Licensed Operator Problem
  - 7c. Other Personnel Error
  - 7d. Maintenance Problem
  - 7e. Design/Installation/Fabrication Problem
  - 7f. Equipment Failure

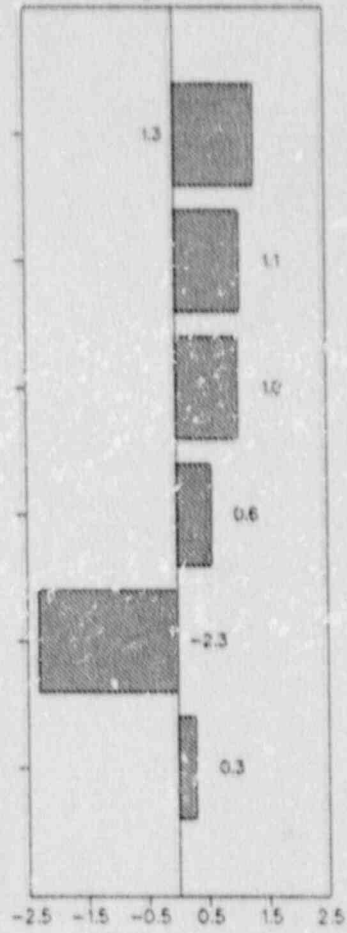
### Trends

Declined Improved



### Deviations from Older Plant Means

Below Avg. Above Avg.



Deviations from Older Plant Means (Measured in Standard Deviations)  
(4 Qtr. Avg end 89-2)

Deviations from Previous 4 Qtr. Plant Means (Measured in Standard Deviations)  
(2 Qtr. Avg end 89-2)

• NOTE: Cause Code Avgs end 89-1

FIGURE 4.37

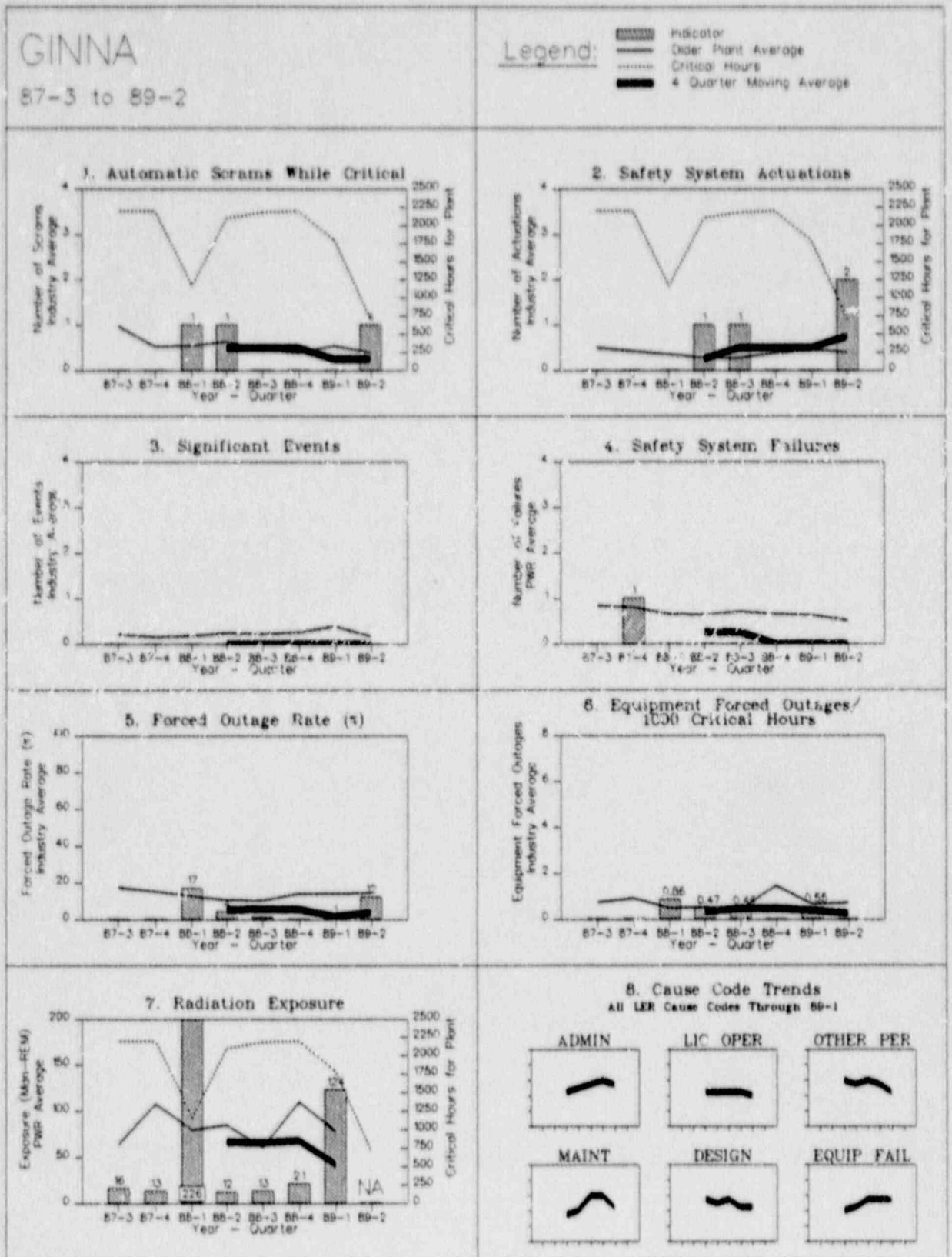


FIGURE 4.37

GINNA

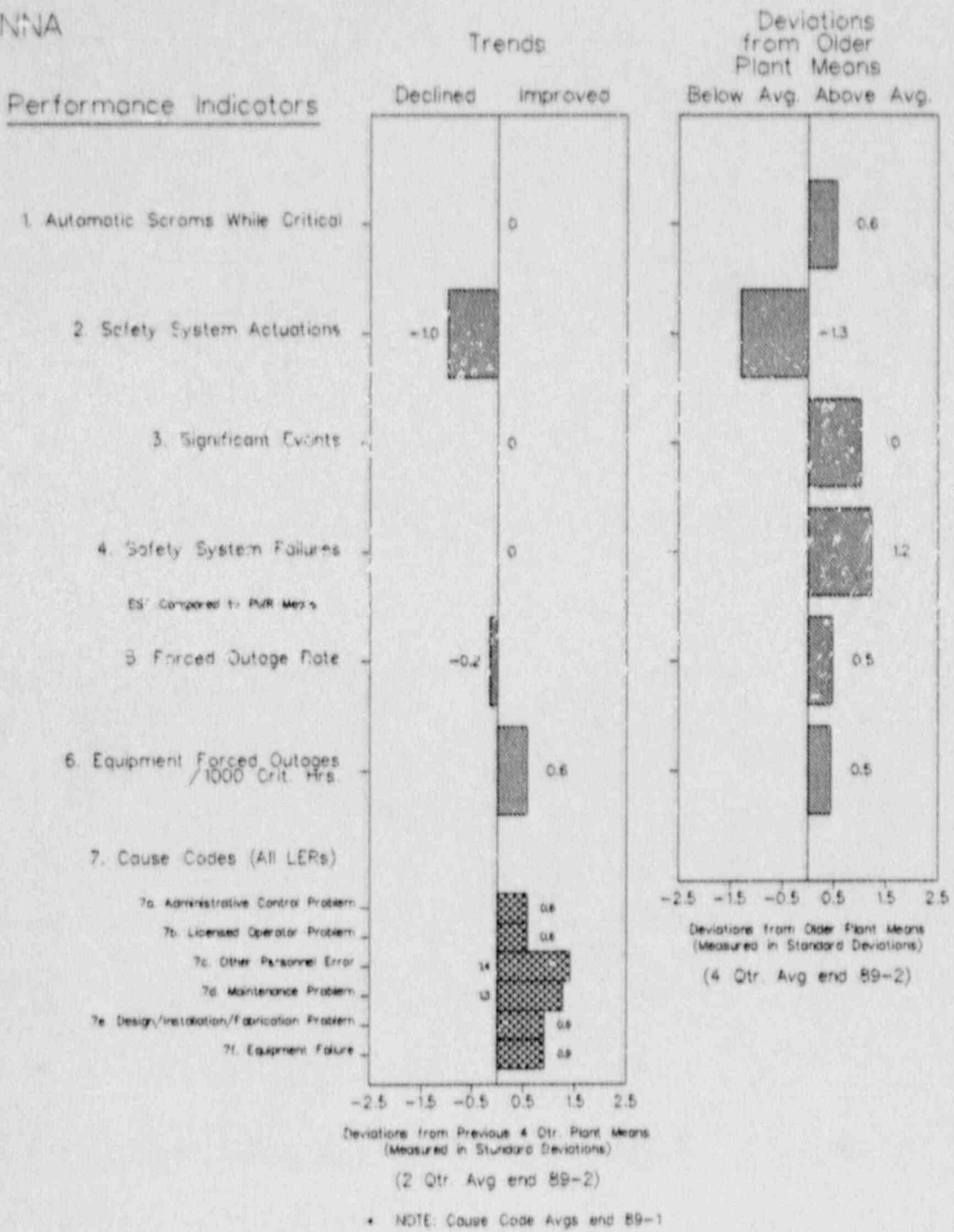


FIGURE 4.38

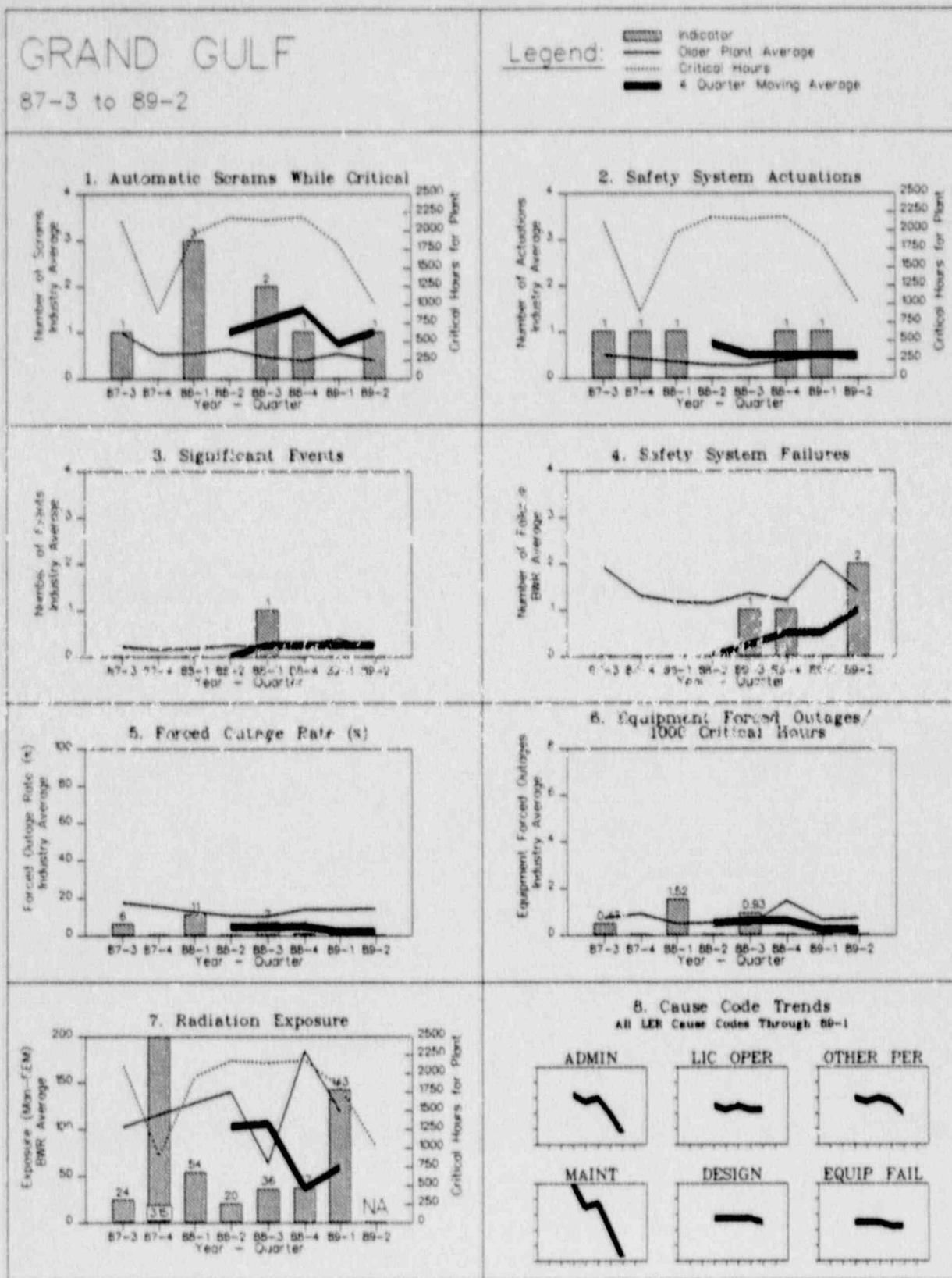
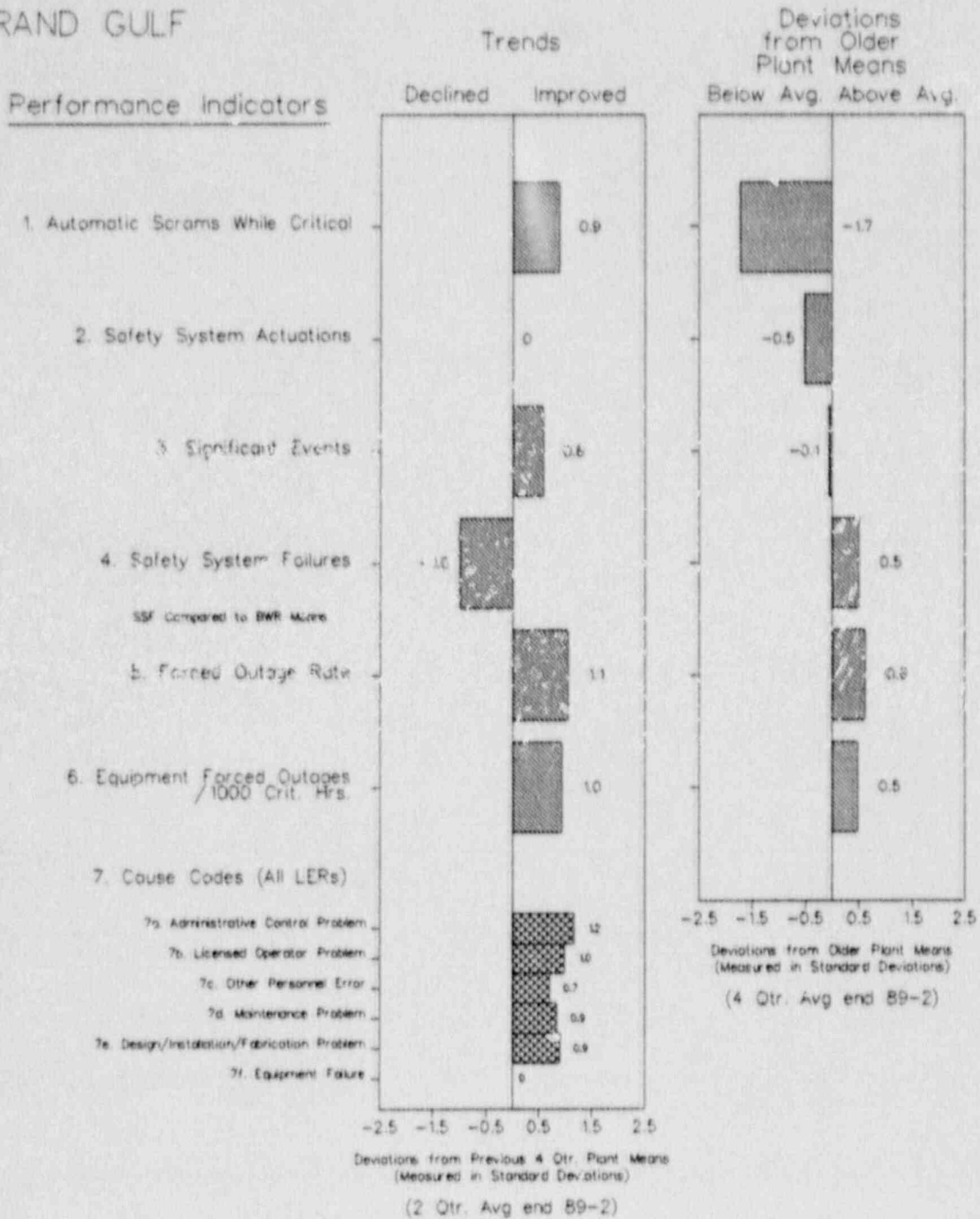


FIGURE 4.3B

GRAND GULF



\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.39

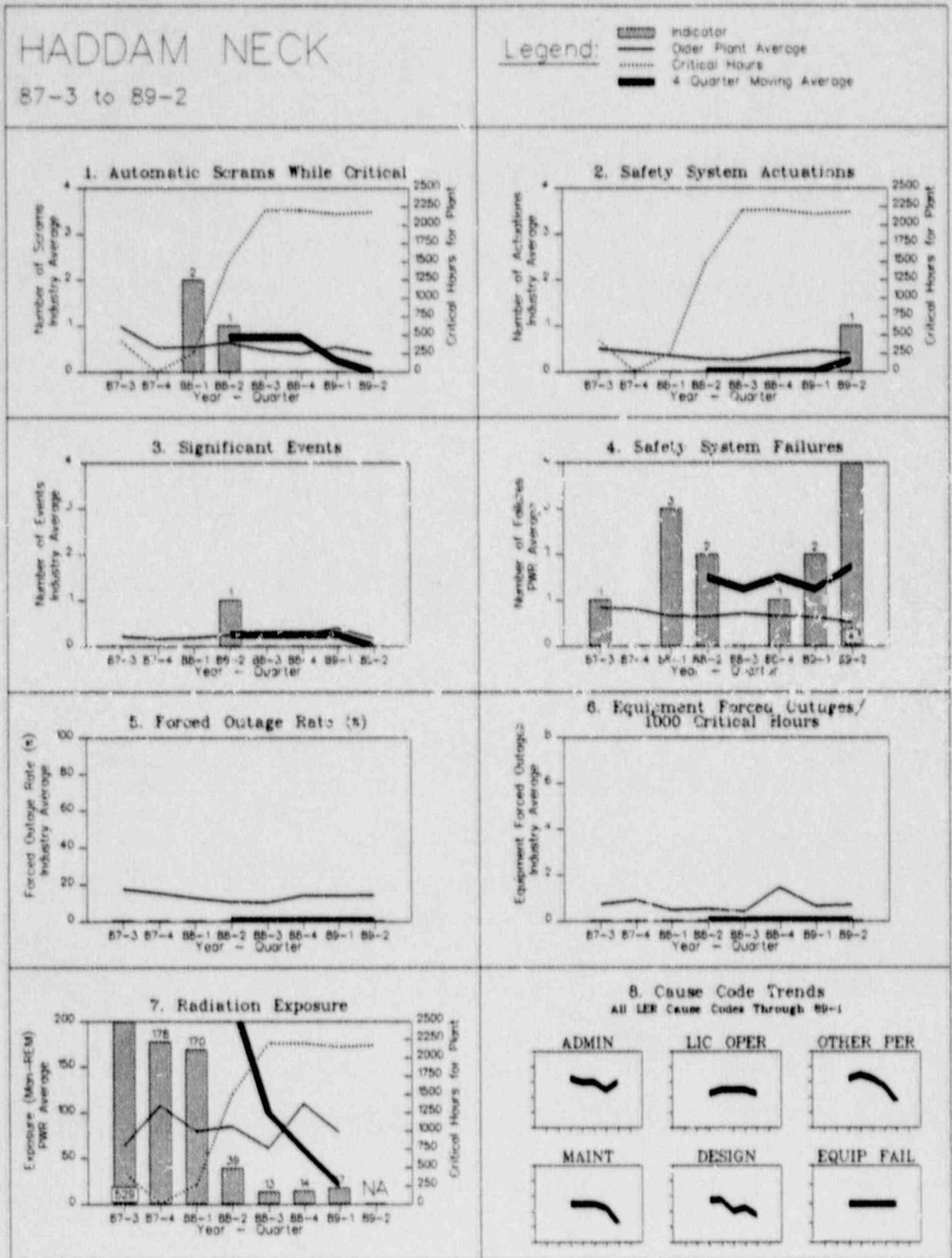
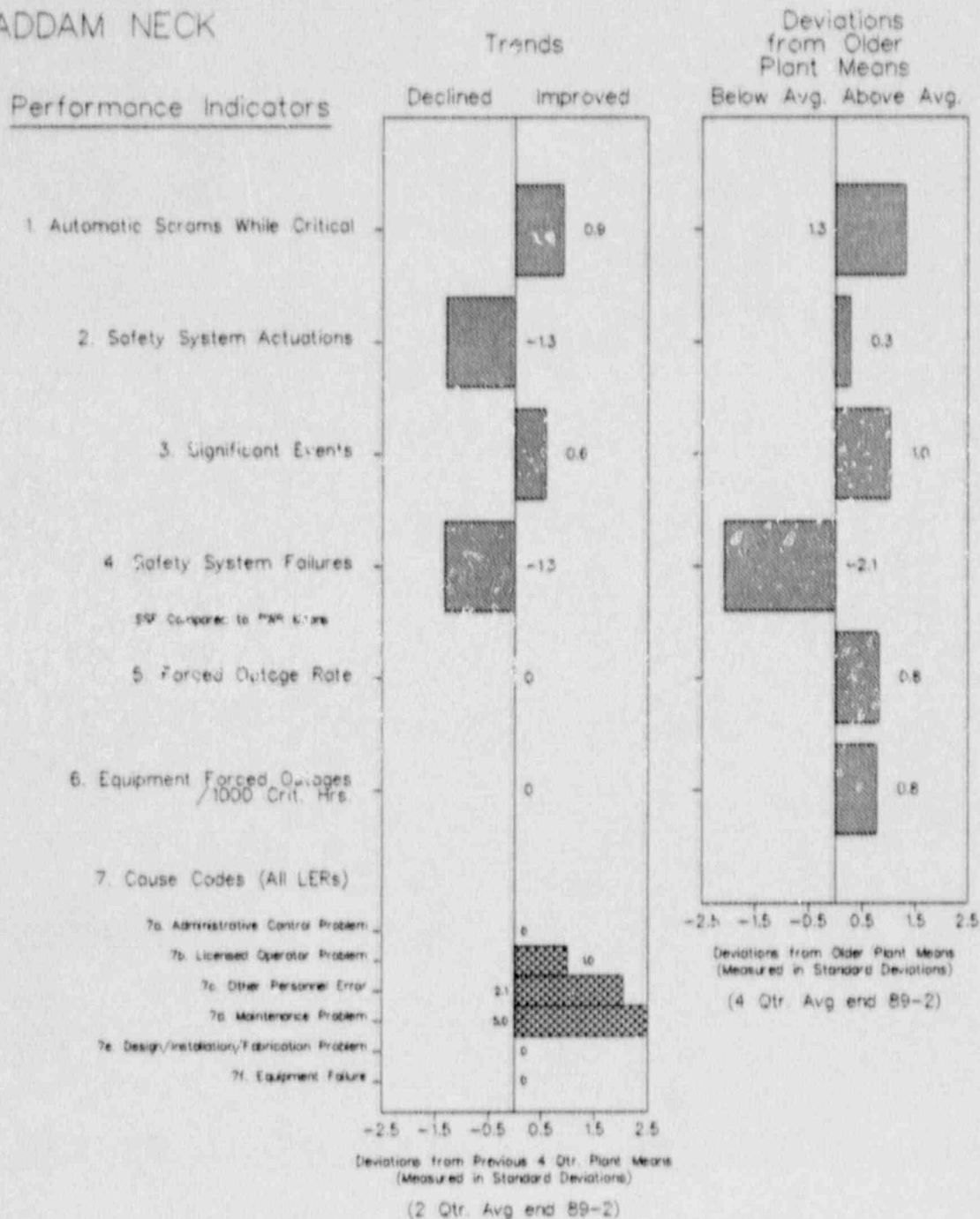




FIGURE 4.39

# HADDAM NECK



\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.40

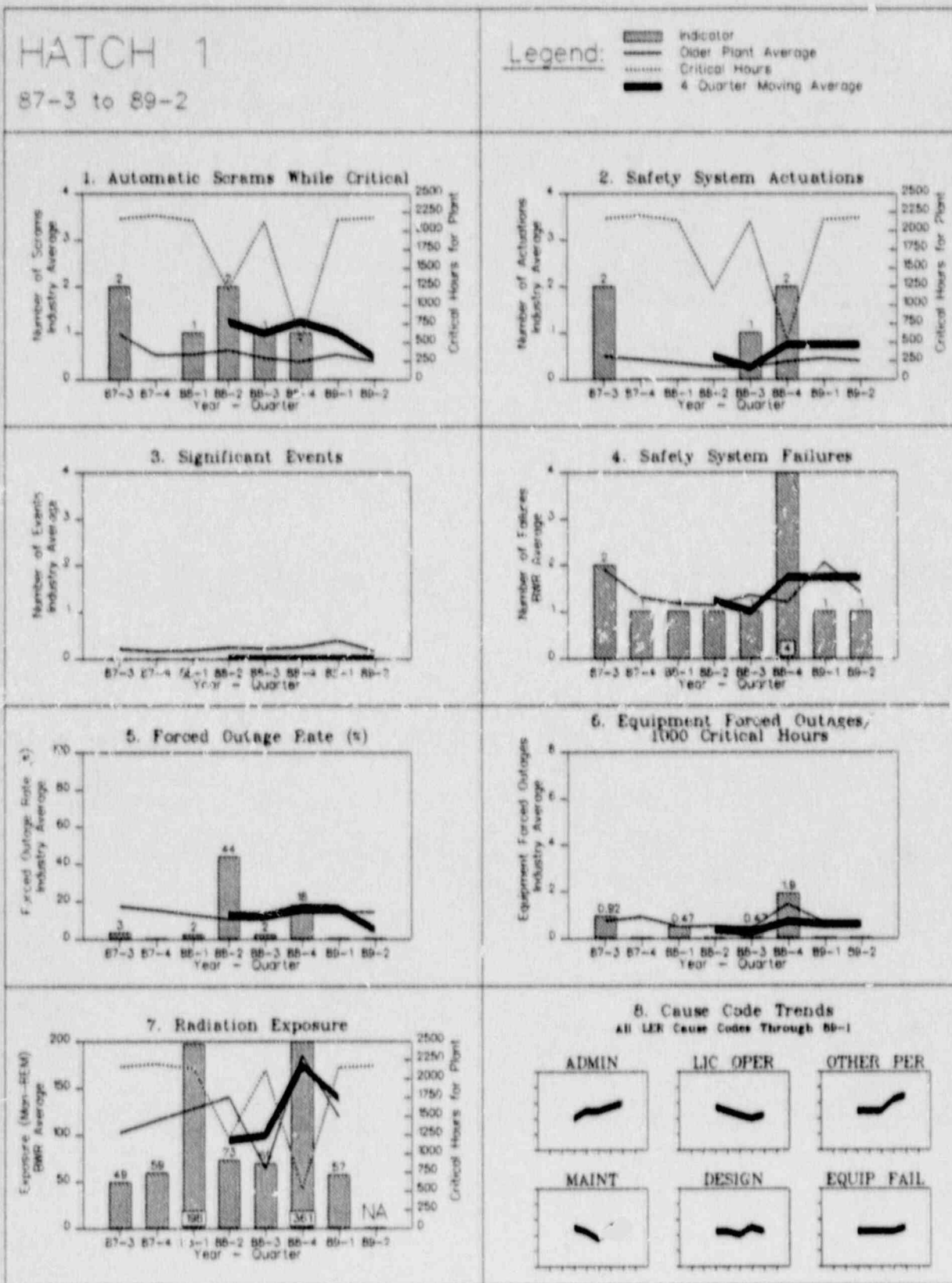
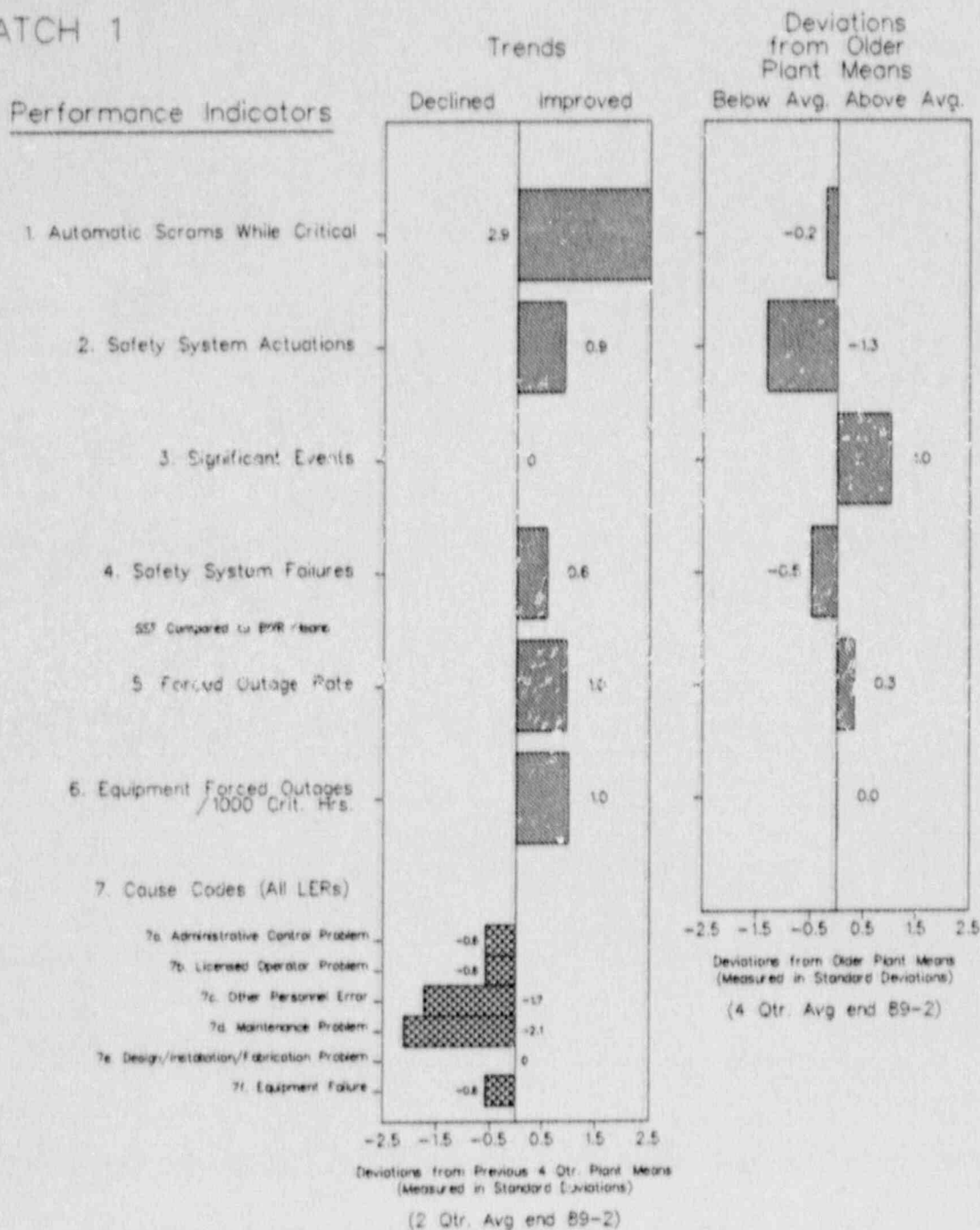


FIGURE 4.40

HATCH 1



• NOTE: Cause Code Avgs end 89-1

FIGURE 4.41

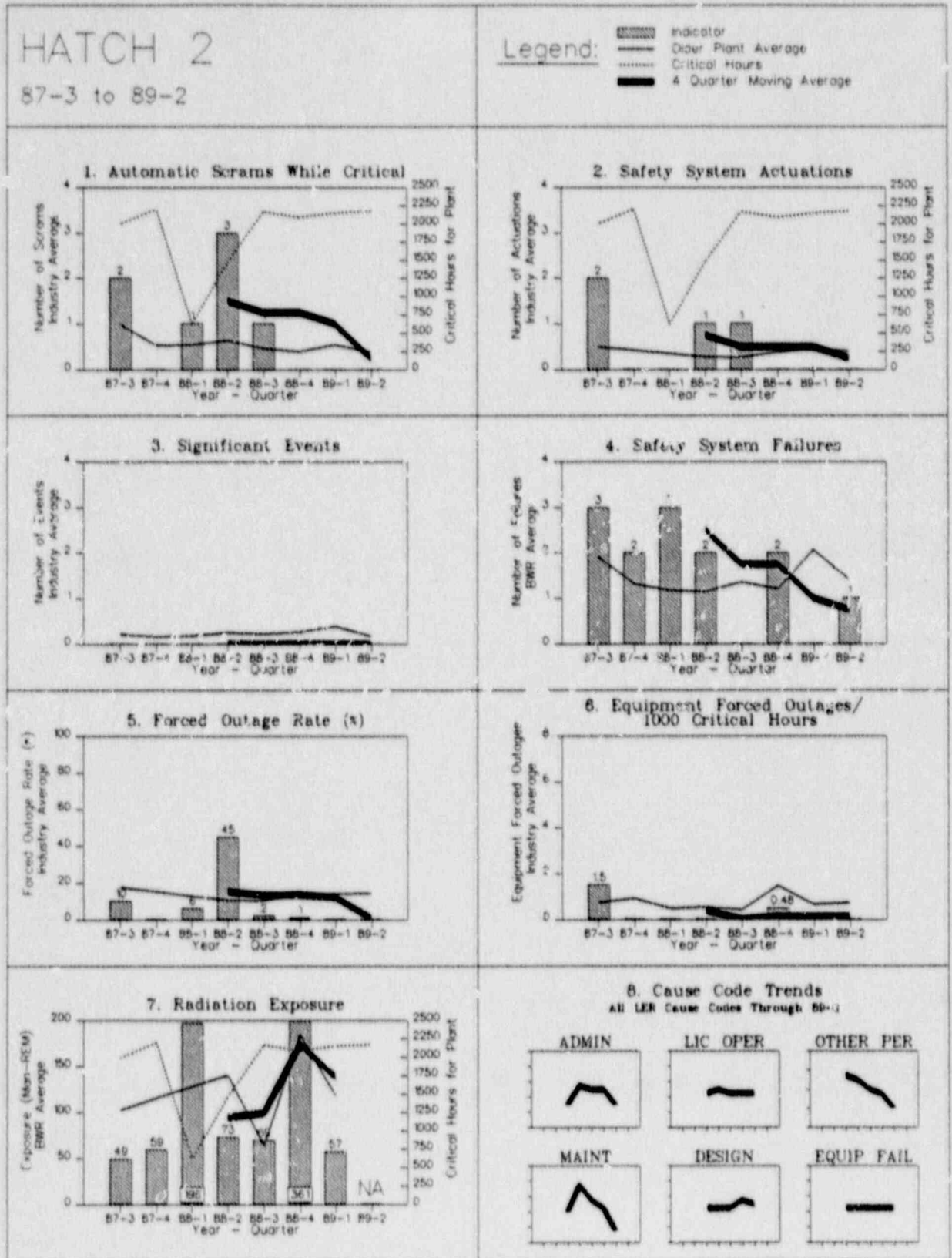


FIGURE 4.41

HATCH 2

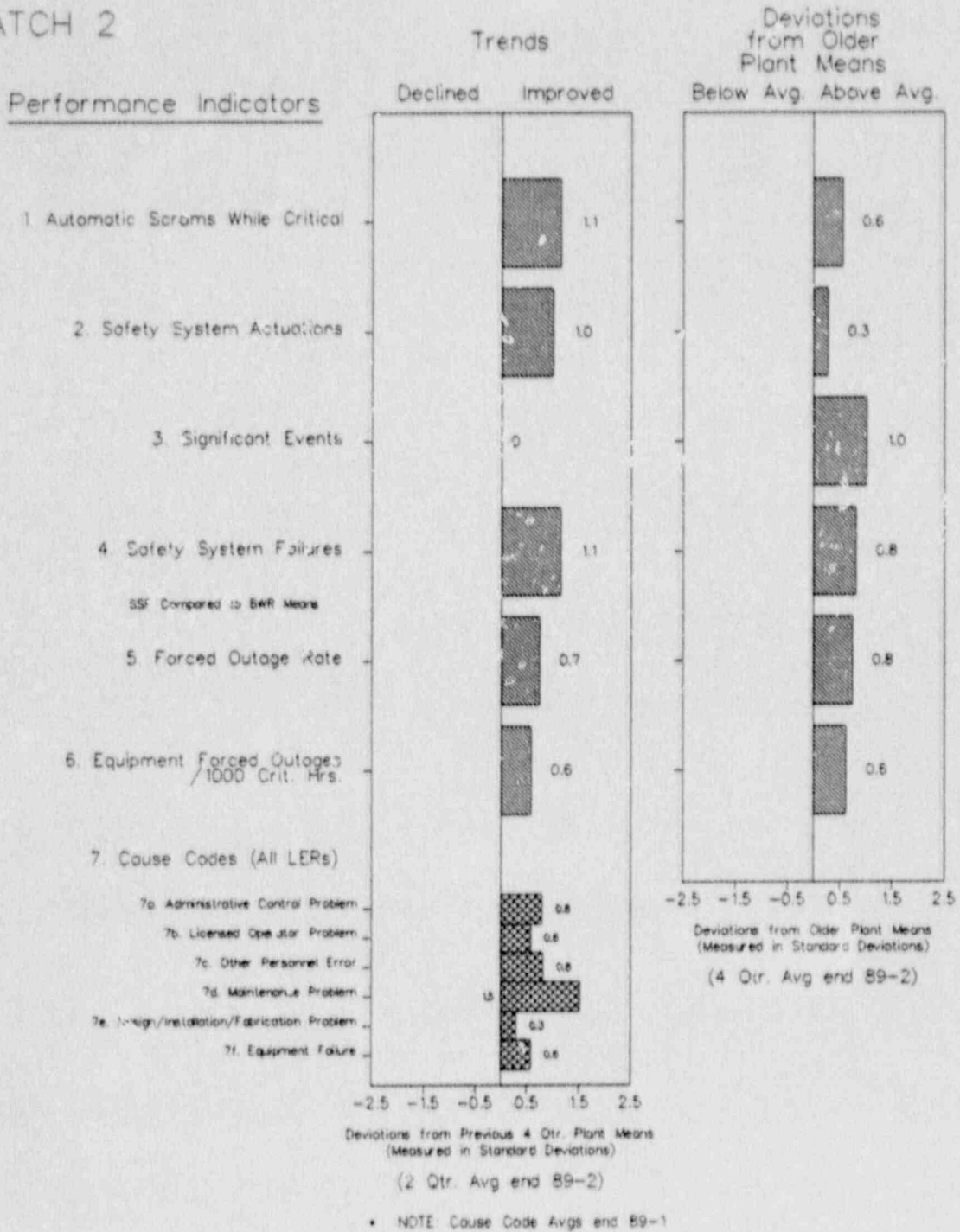


FIGURE 4.42

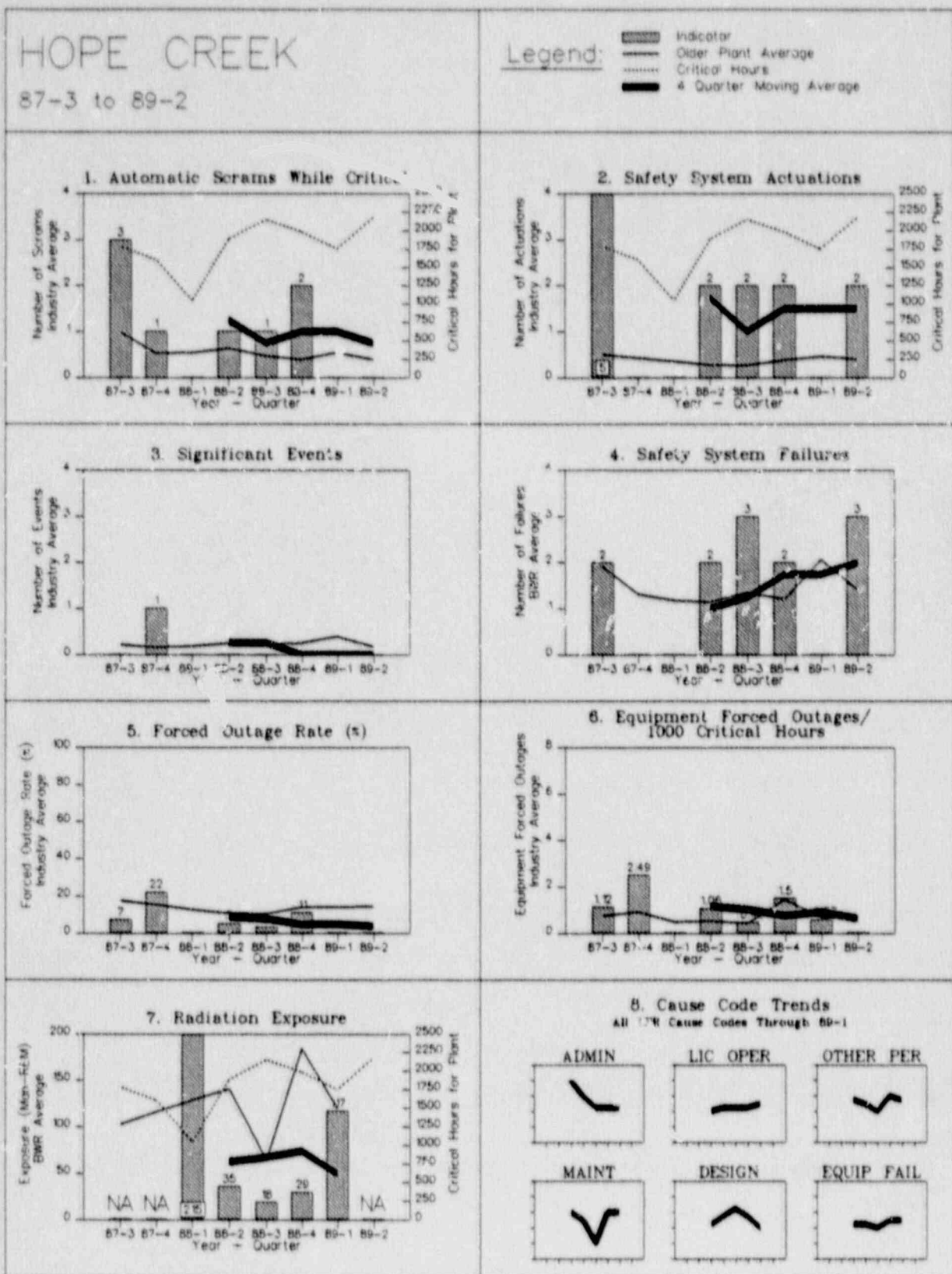
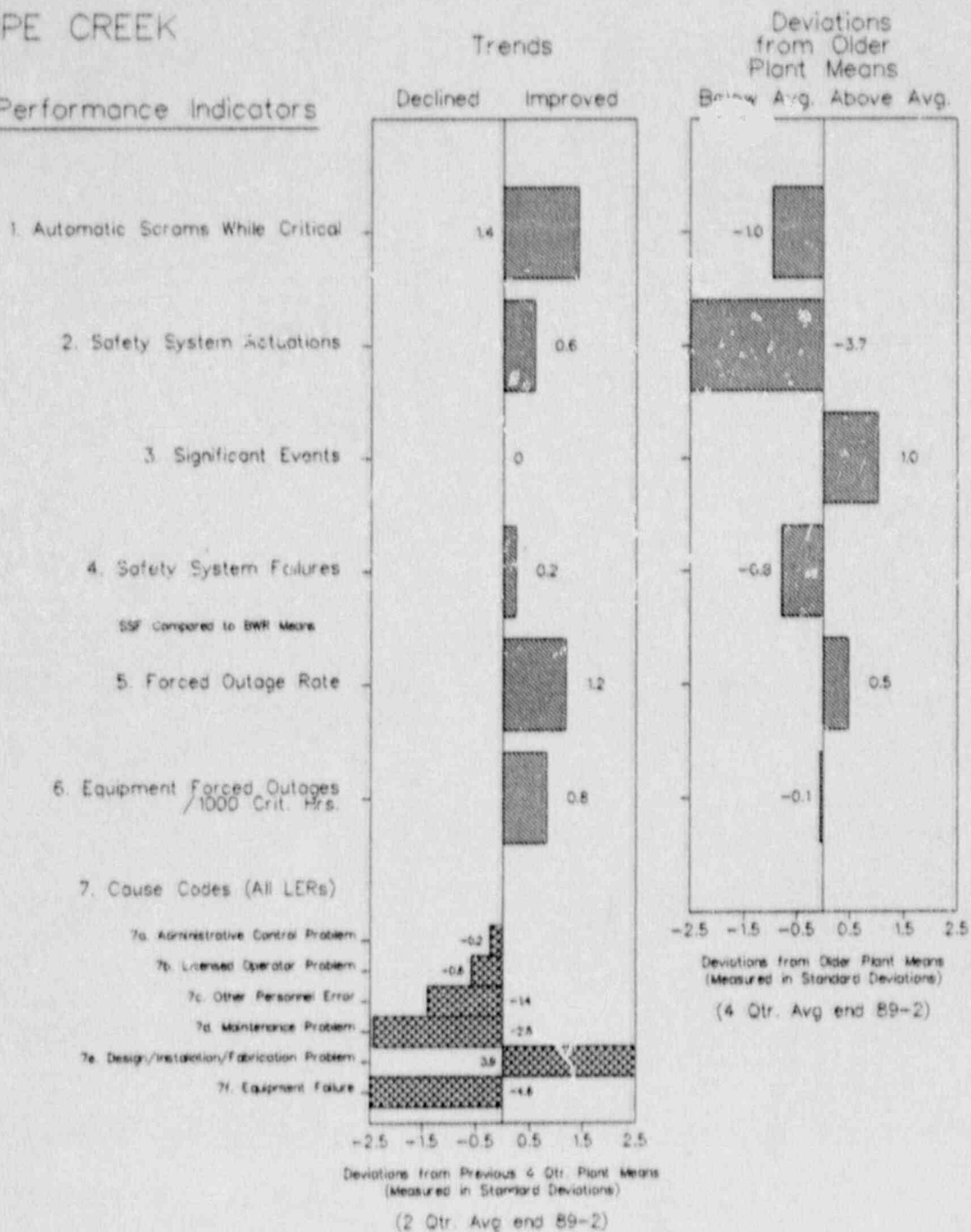


FIGURE 4.42

# HOPE CREEK

## Performance Indicators



\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.43

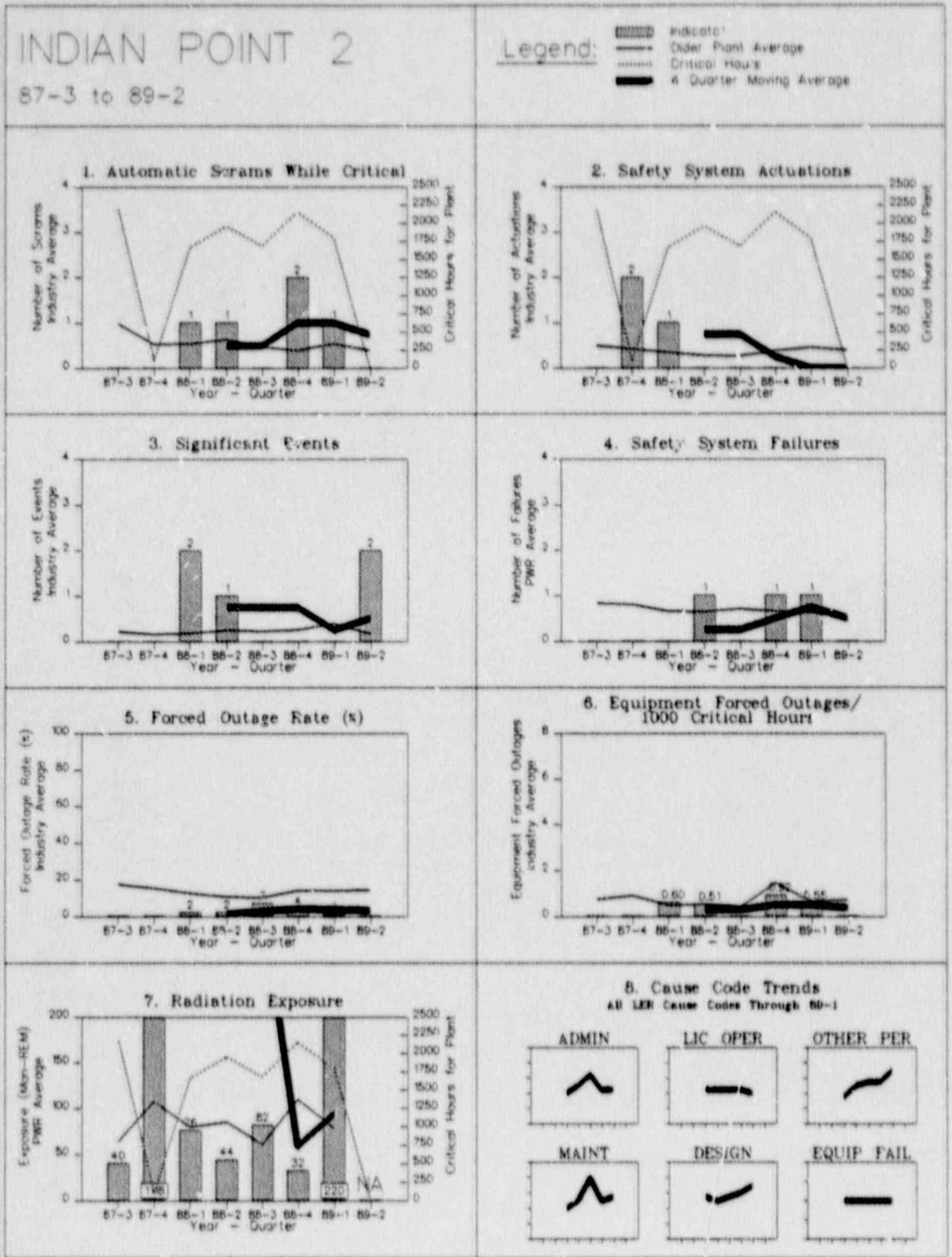




FIGURE 4.43

INDIAN POINT 2

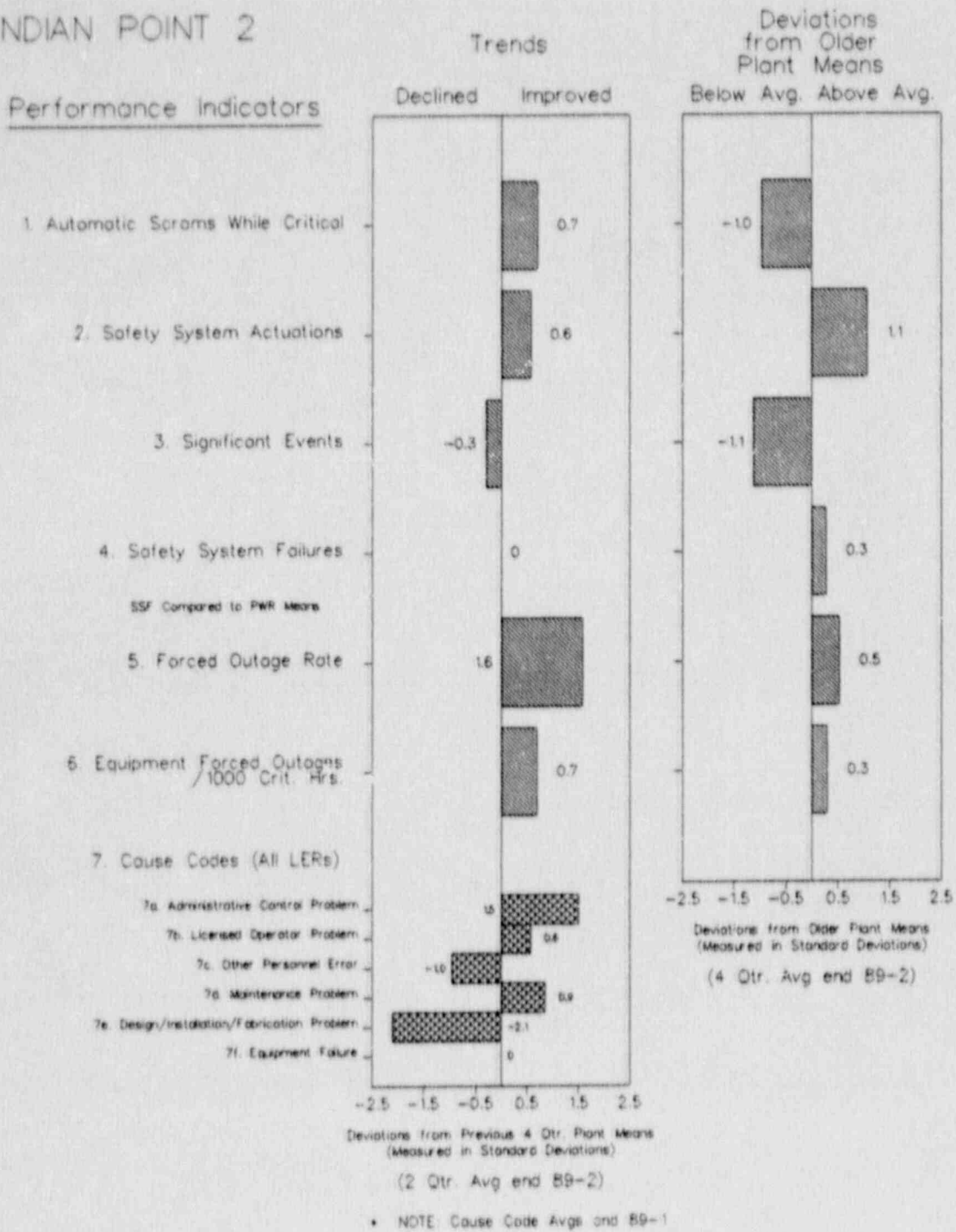


FIGURE 4.44

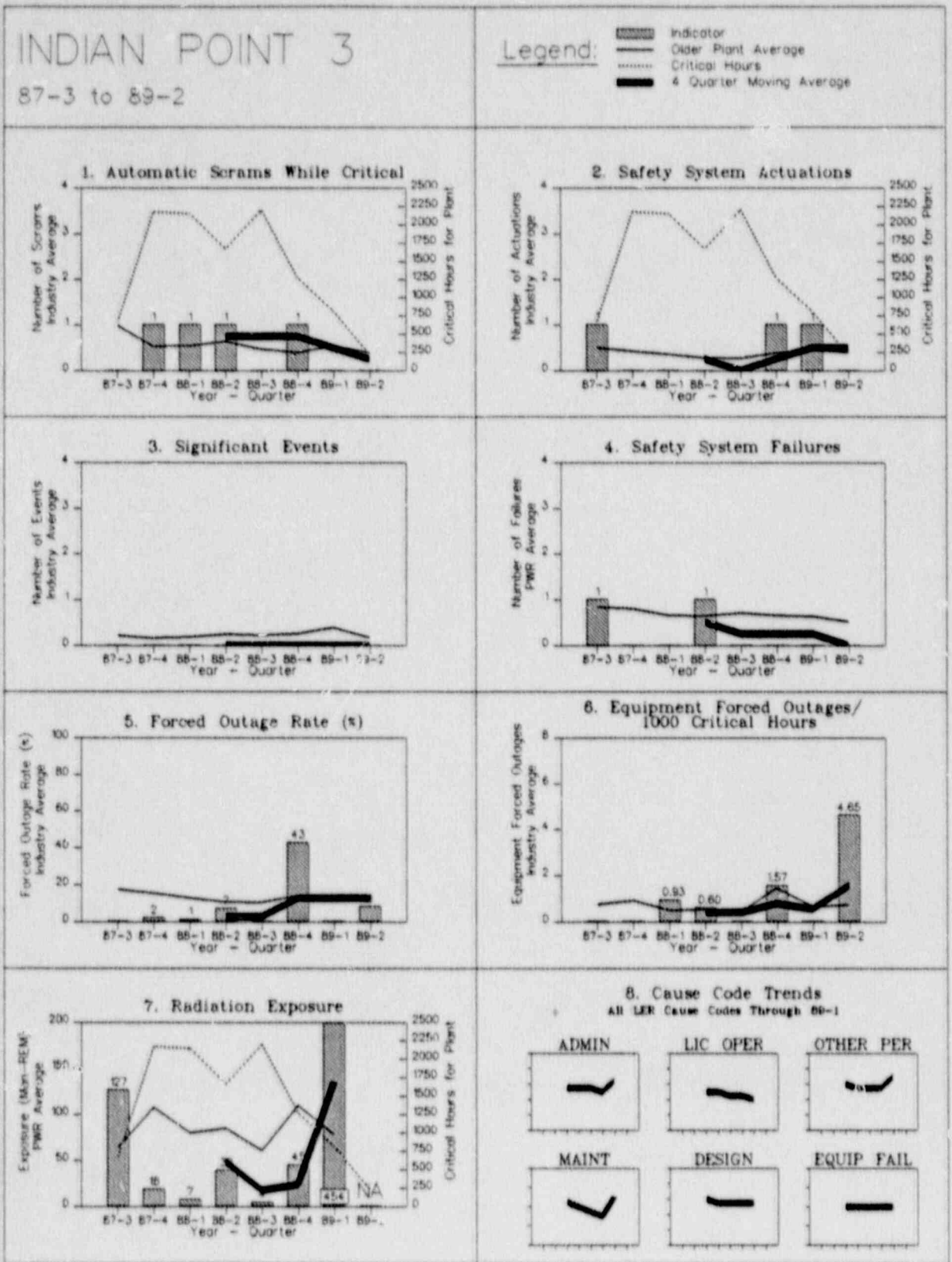


FIGURE 4.44

INDIAN POINT 3

Performance Indicators

Trends

Declined Improved

Deviations from Older Plant Means  
Below Avg. Above Avg.

1. Automatic Scrams While Critical

1.7

0.6

2. Safety System Actuations

-0.6

-0.5

3. Significant Events

0

1.0

4. Safety System Failures

0.6

1.2

SSF Compared to PWR Means

5. Forced Outage Rate

0.5

-0.4

6. Equipment Forced Outages / 1000 Crit. Hrs.

-2.7

-1.3

7. Cause Codes (All LERs)

7a. Administrative Control Problem

-2.9

7b. Licensed Operator Problem

0.6

7c. Other Personnel Error

-4.0

7d. Maintenance Problem

-4.0

7e. Design/Installation/Fabrication Problem

-0.5

7f. Equipment Failure

0

-2.5 -1.5 -0.5 0.5 1.5 2.5

Deviations from Previous 4 Qtr. Plant Means (Measured in Standard Deviations)

(2 Qtr. Avg end 89-2)

-2.5 -1.5 -0.5 0.5 1.5 2.5

Deviations from Older Plant Means (Measured in Standard Deviations)

(4 Qtr. Avg end 89-2)

\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.45

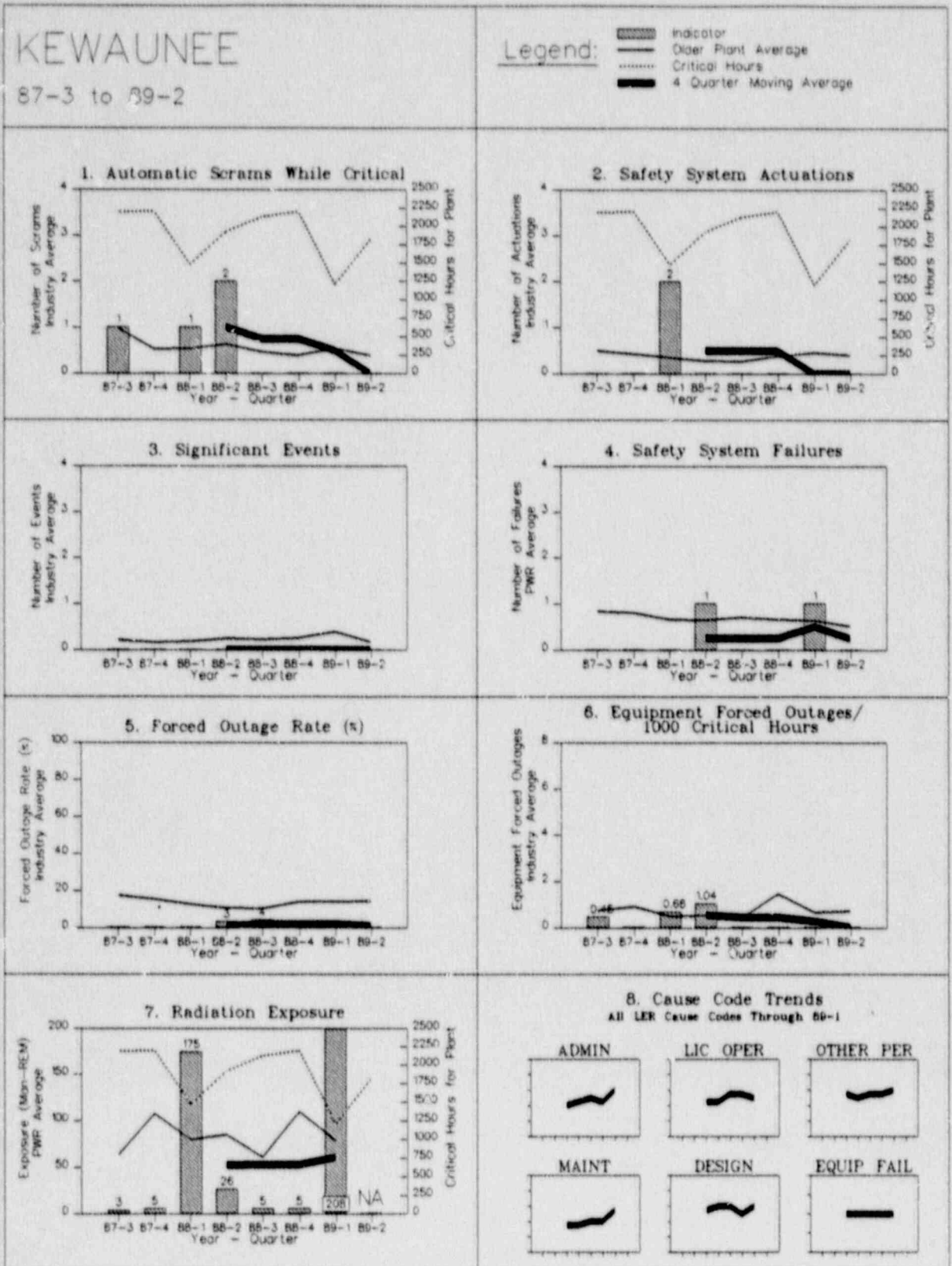
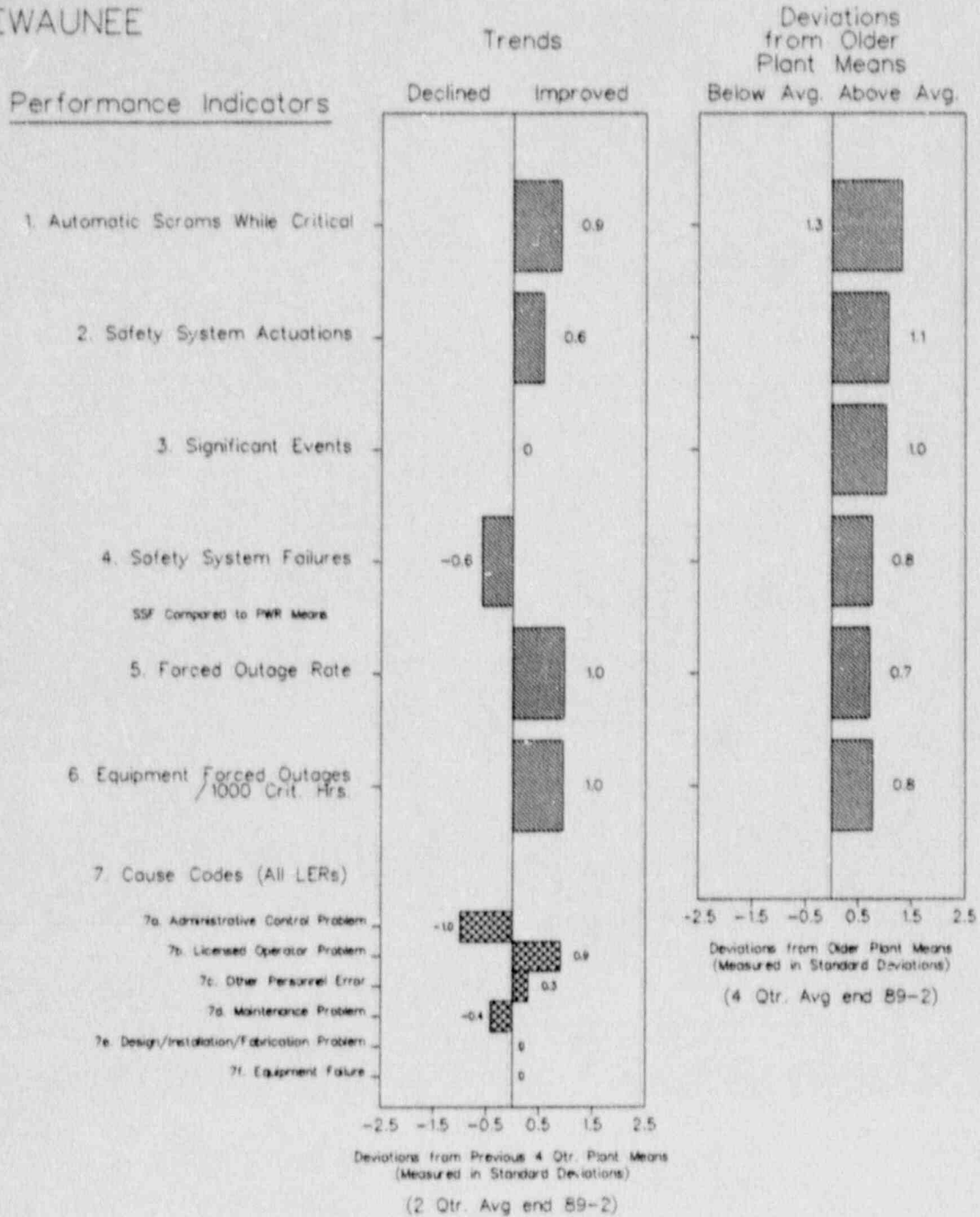


FIGURE 4.45

KEWAUNEE



• NOTE: Cause Code Avgs end 89-1

FIGURE 4.46

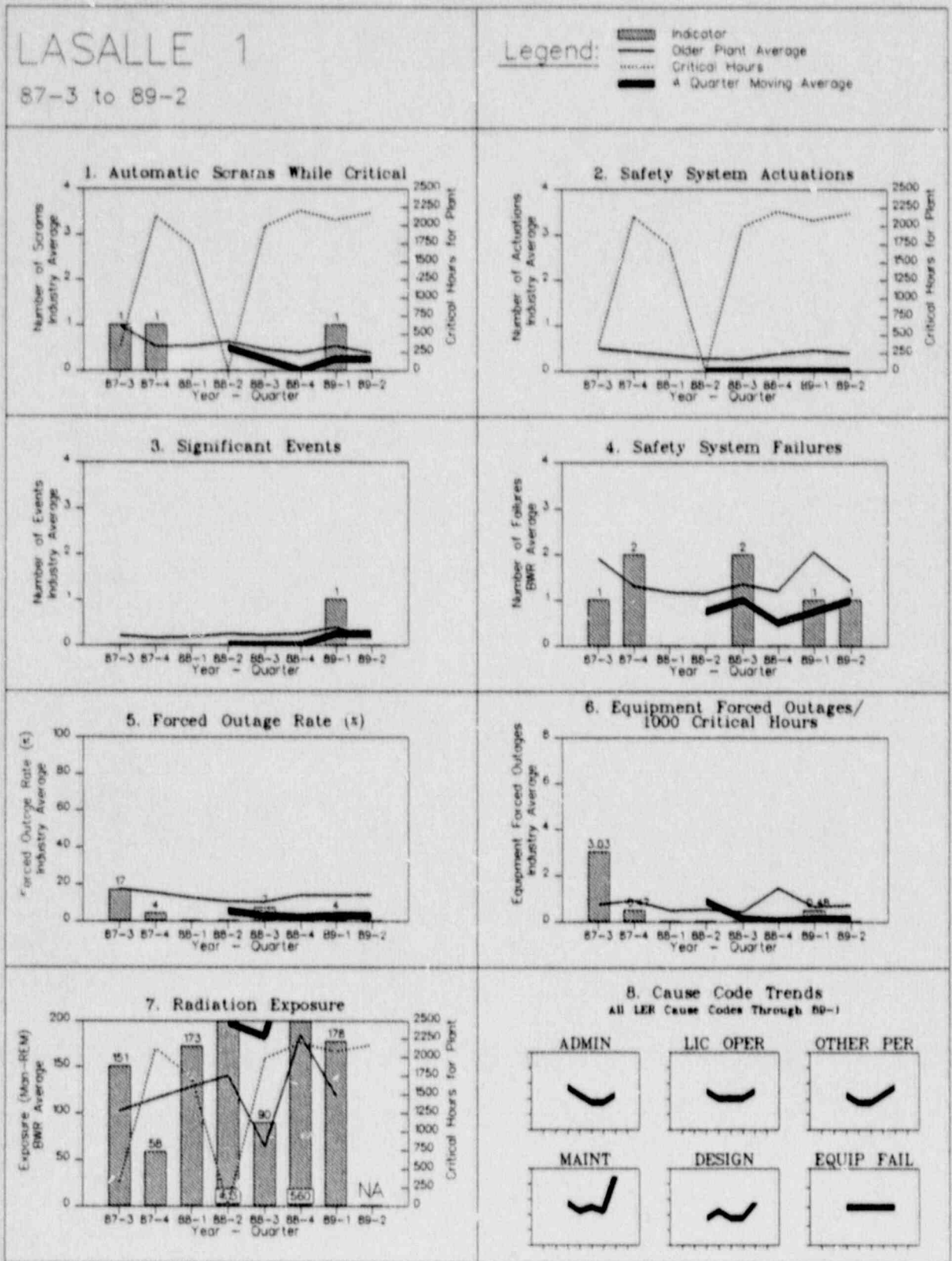
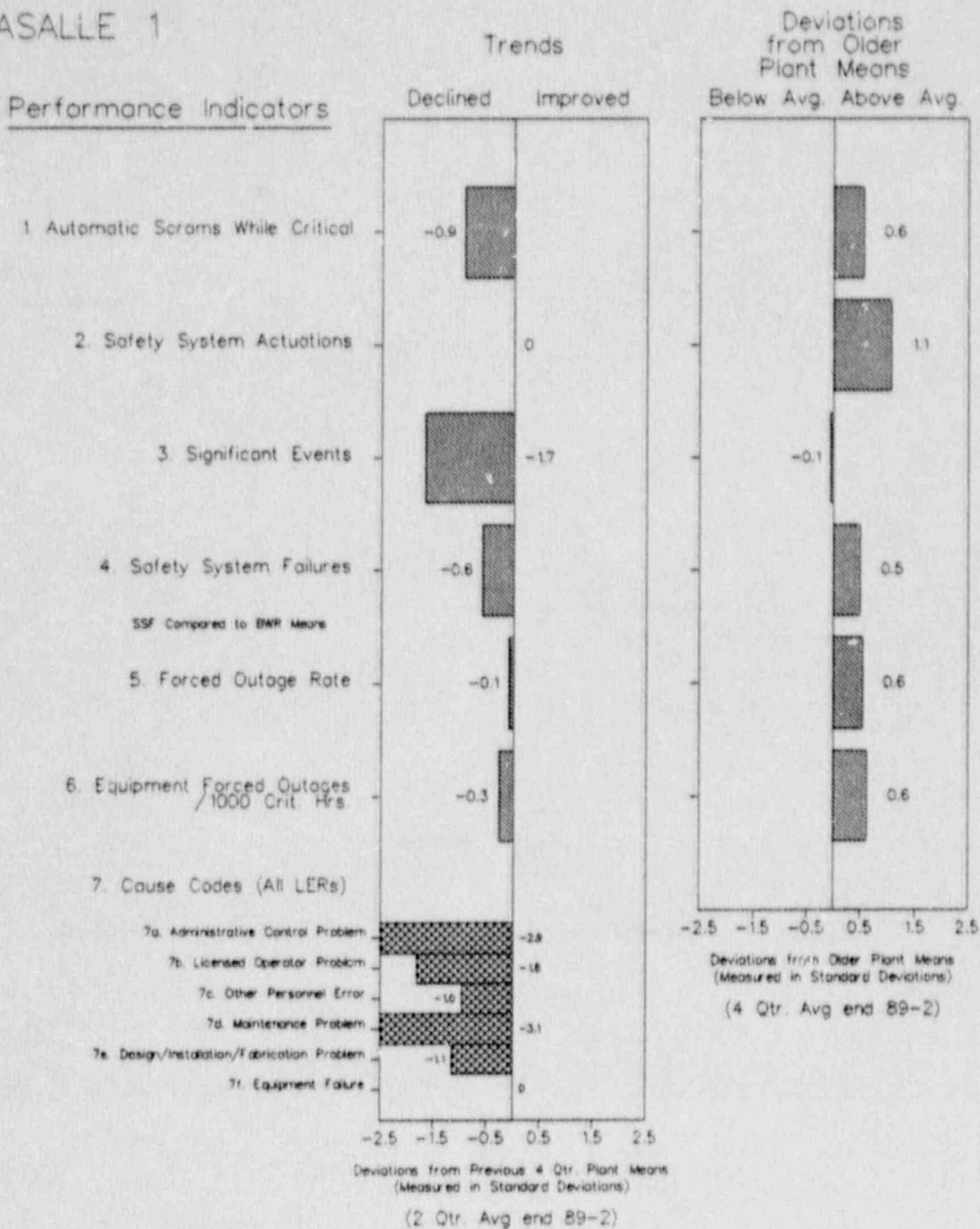


FIGURE 4.46

LASALLE 1



• NOTE: Cause Code Avgs end 89-1

FIGURE 4.47

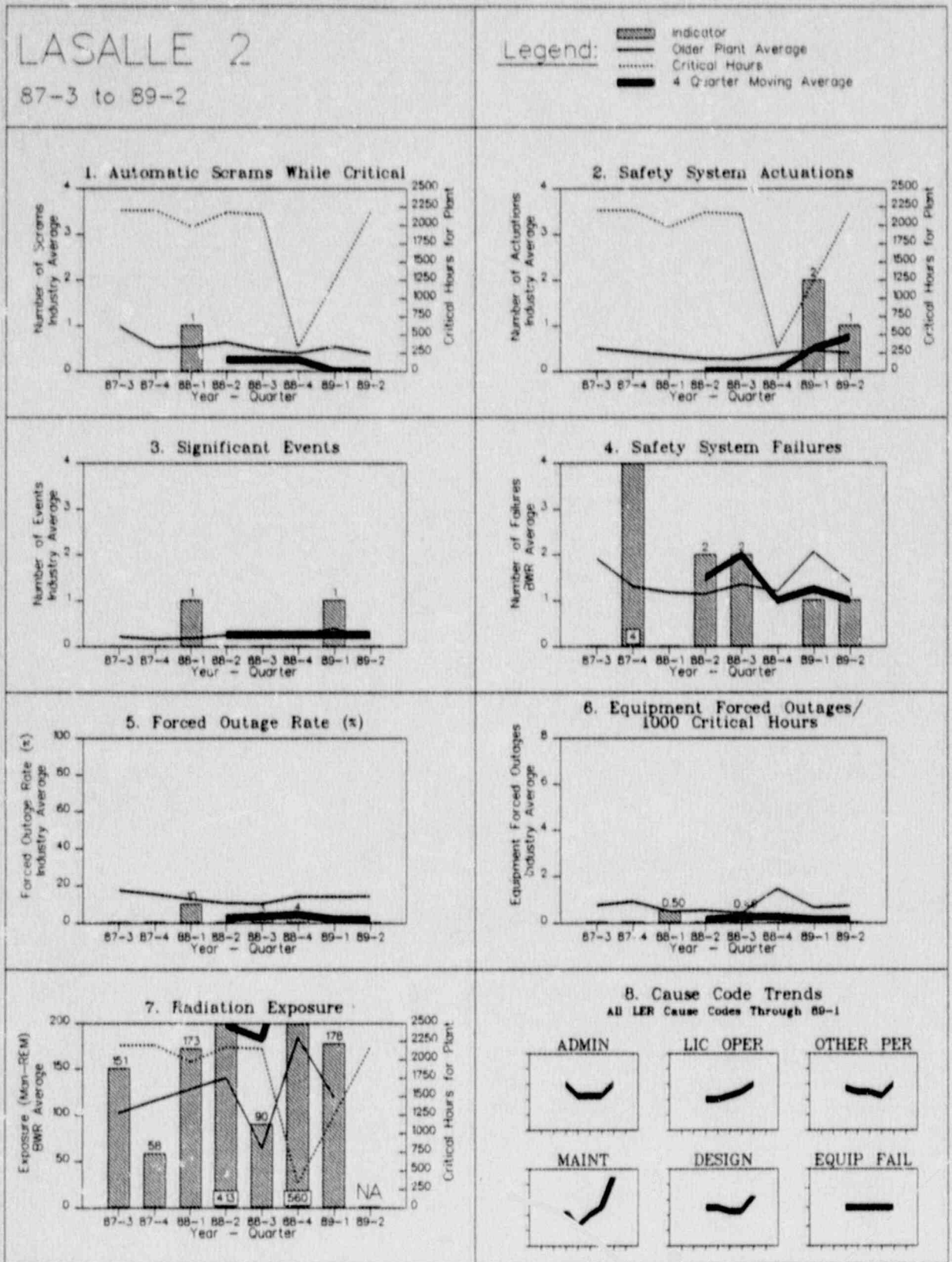
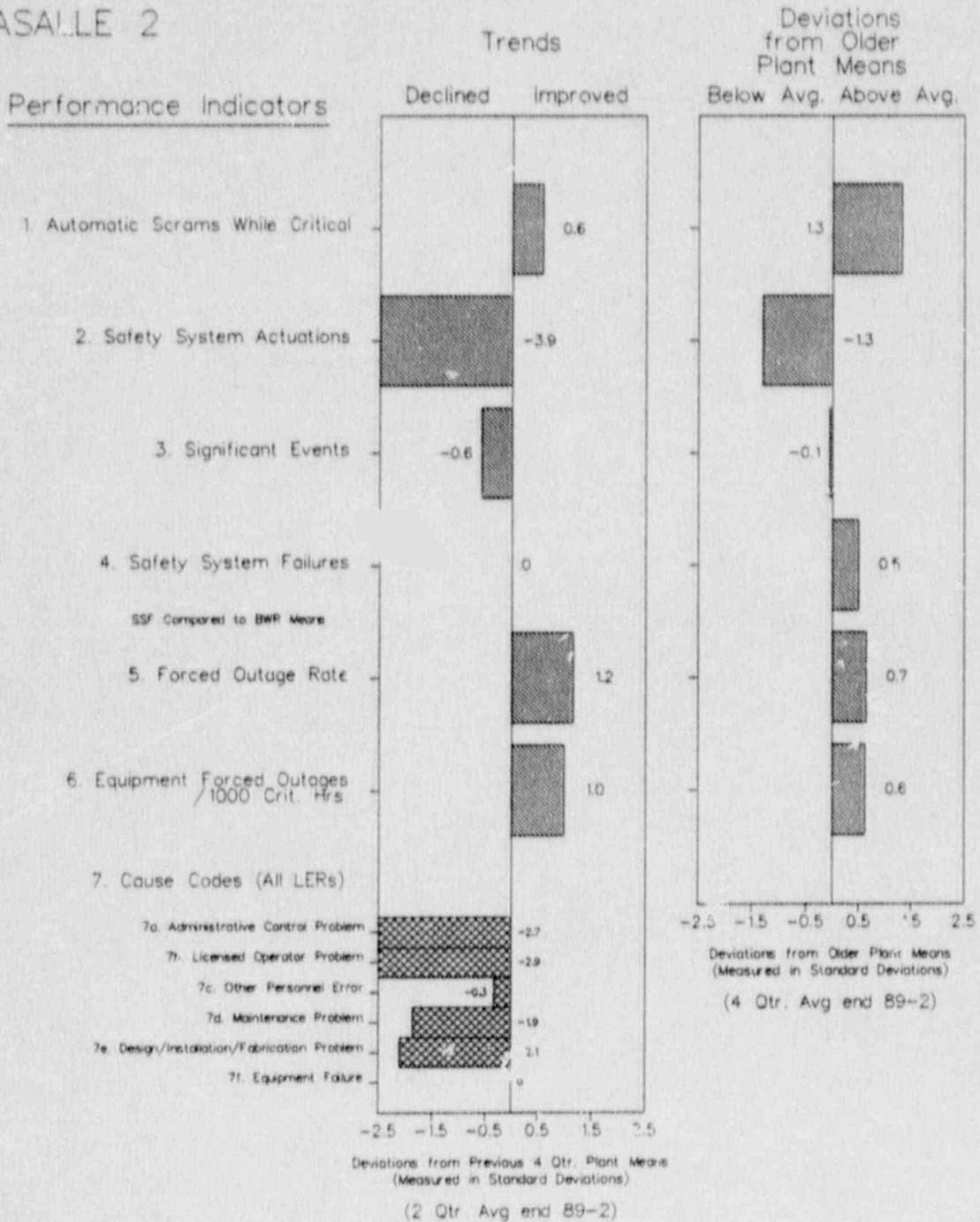




FIGURE 4.47

LASALLE 2



• NOTE: Cause Code Avgs end 89-1

FIGURE 4.48

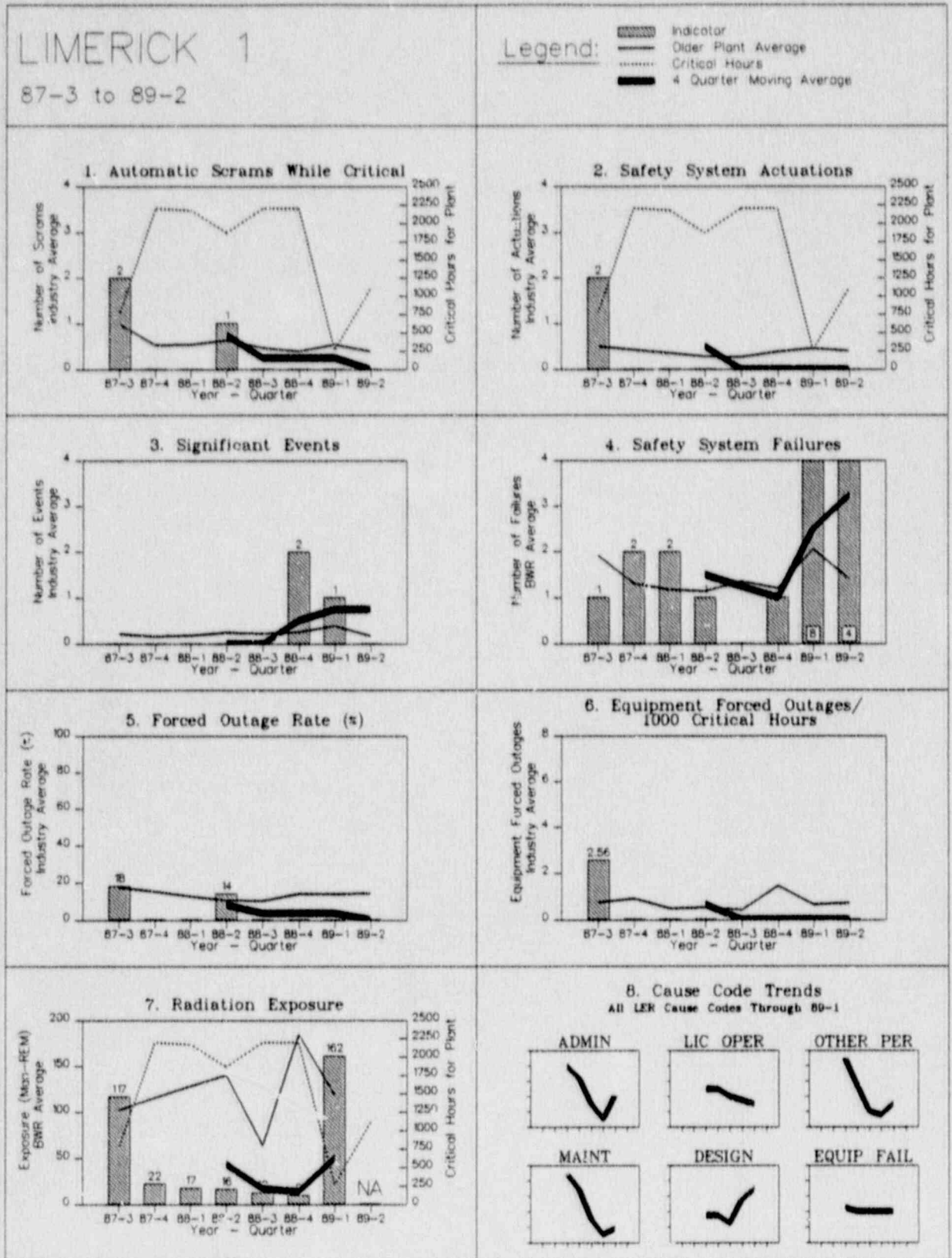
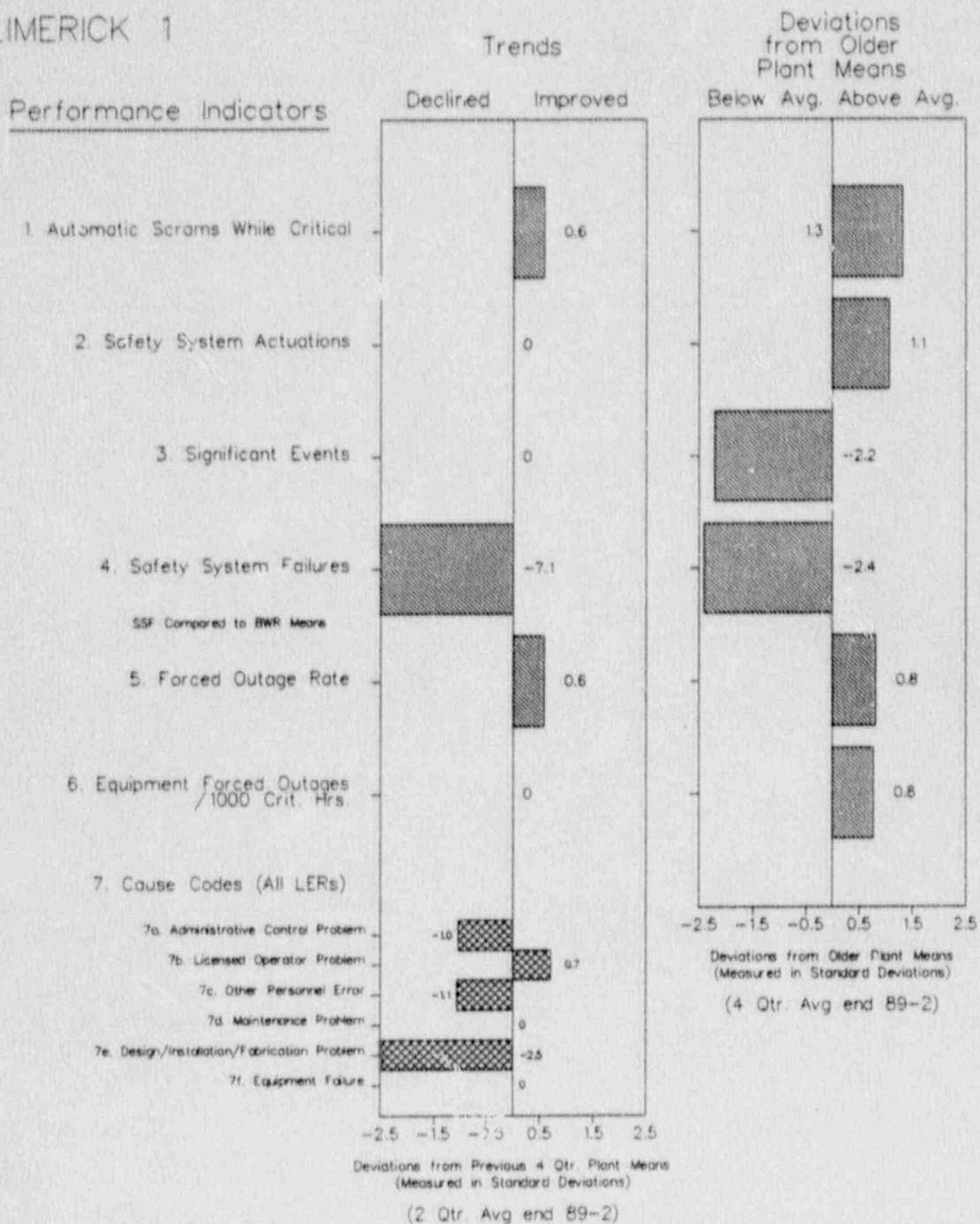


FIGURE 4.48

LIMERICK 1



• NOTE: Cause Code Avgs end 89-1

FIGURE 4.49

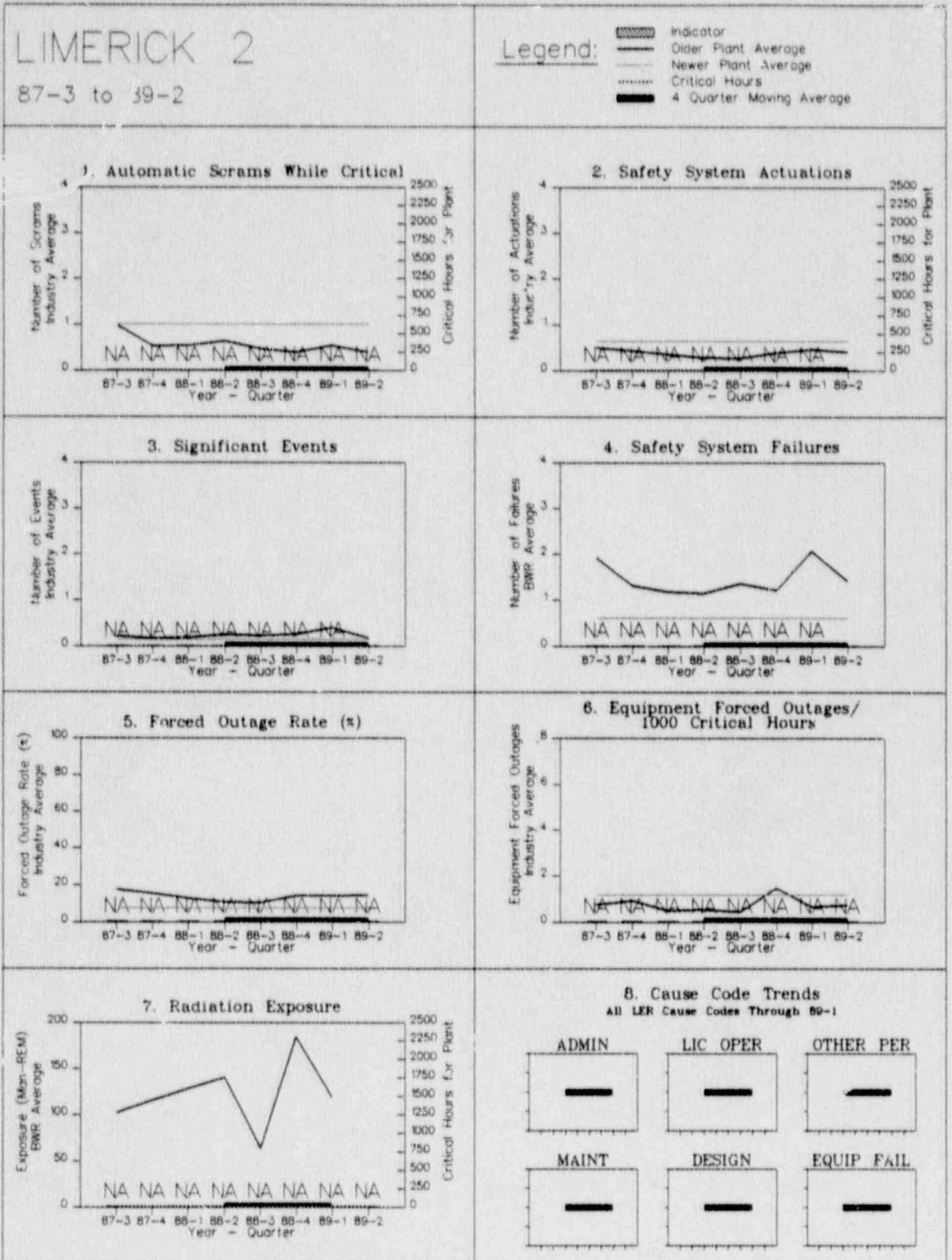
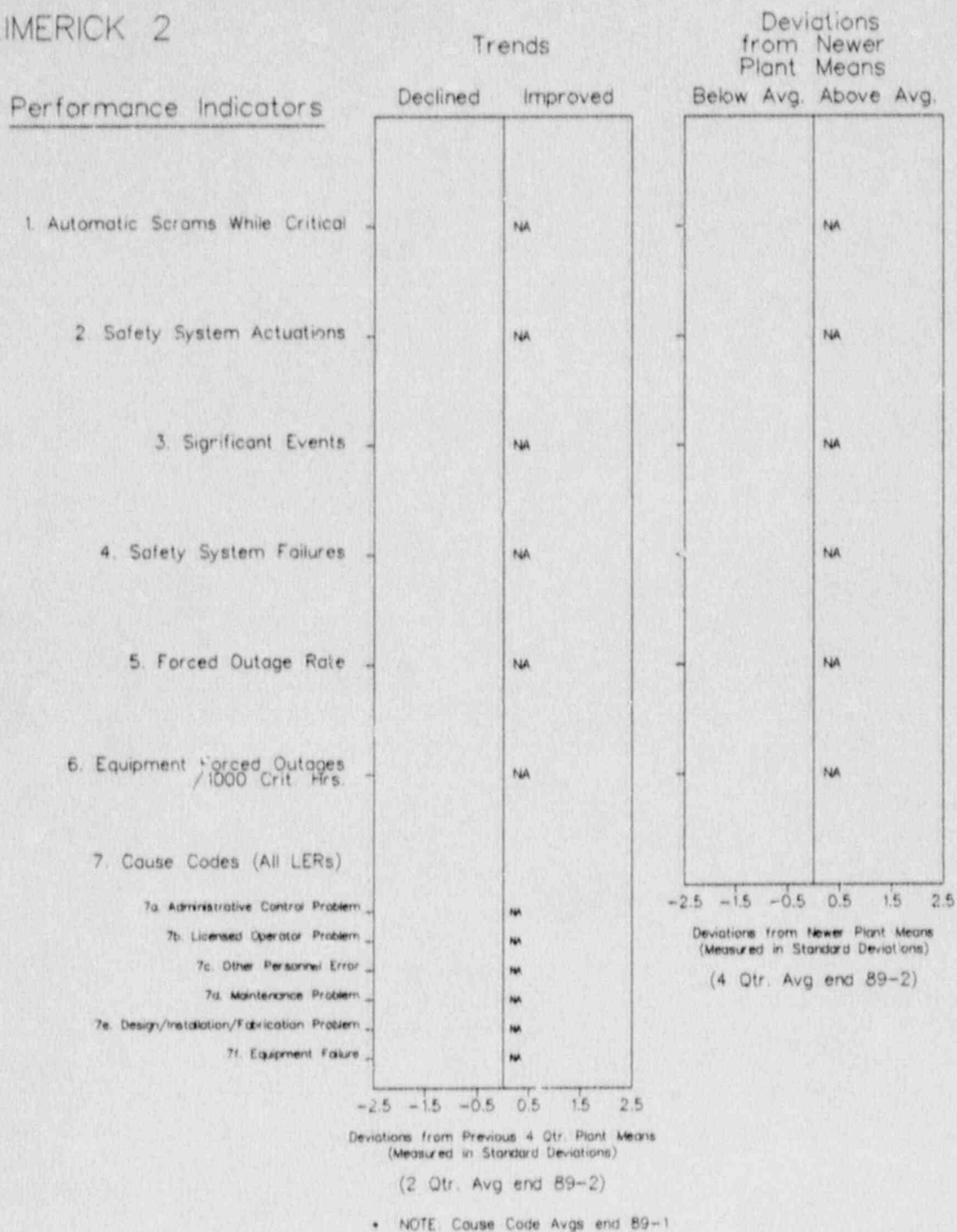


FIGURE 4.49

LIMERICK 2



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FIGURE 4.49

Note: This is a comparison of LIMERICK 2  
(a newer plant) against older plant means.

LIMERICK 2

Performance Indicators

Deviations  
from Older  
Plant Means  
Below Avg. Above Avg.

1. Automatic Scrams While Critical

NA

2. Safety System Actuations

NA

3. Significant Events

NA

4. Safety System Failures

NA

SSF Compared to BWR Means

5. Forced Outage Rate

NA

6. Equipment Forced Outages  
/1000 Crit. Hrs.

NA

-2.5 -1.5 -0.5 0.5 1.5 2.5

Deviations from Older Plant Means  
(Measured in Standard Deviations)

(4 Qtr. Avg end 89-2)

FIGURE 4.50

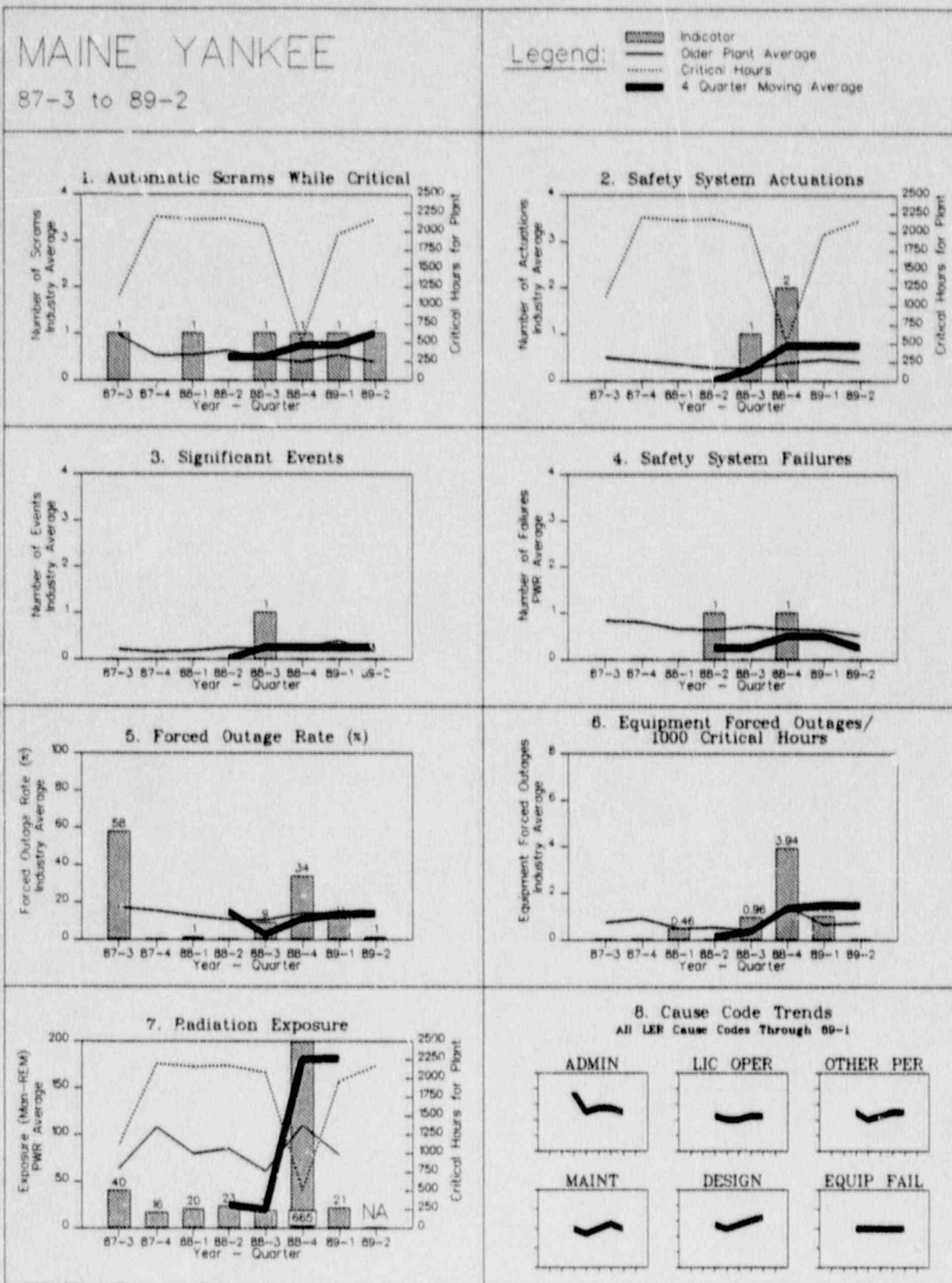




FIGURE 4.50

MAINE YANKEE

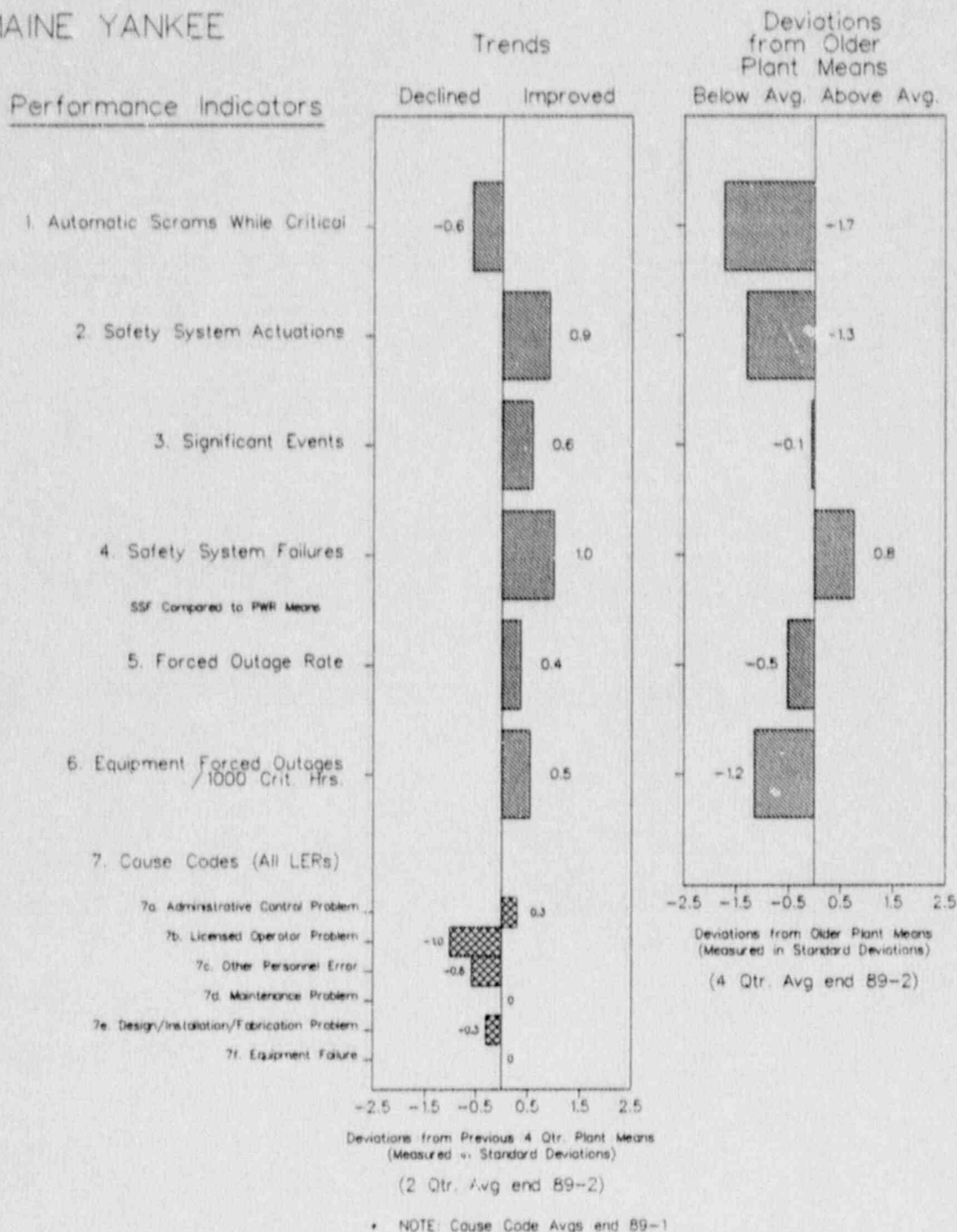


FIGURE 4.51

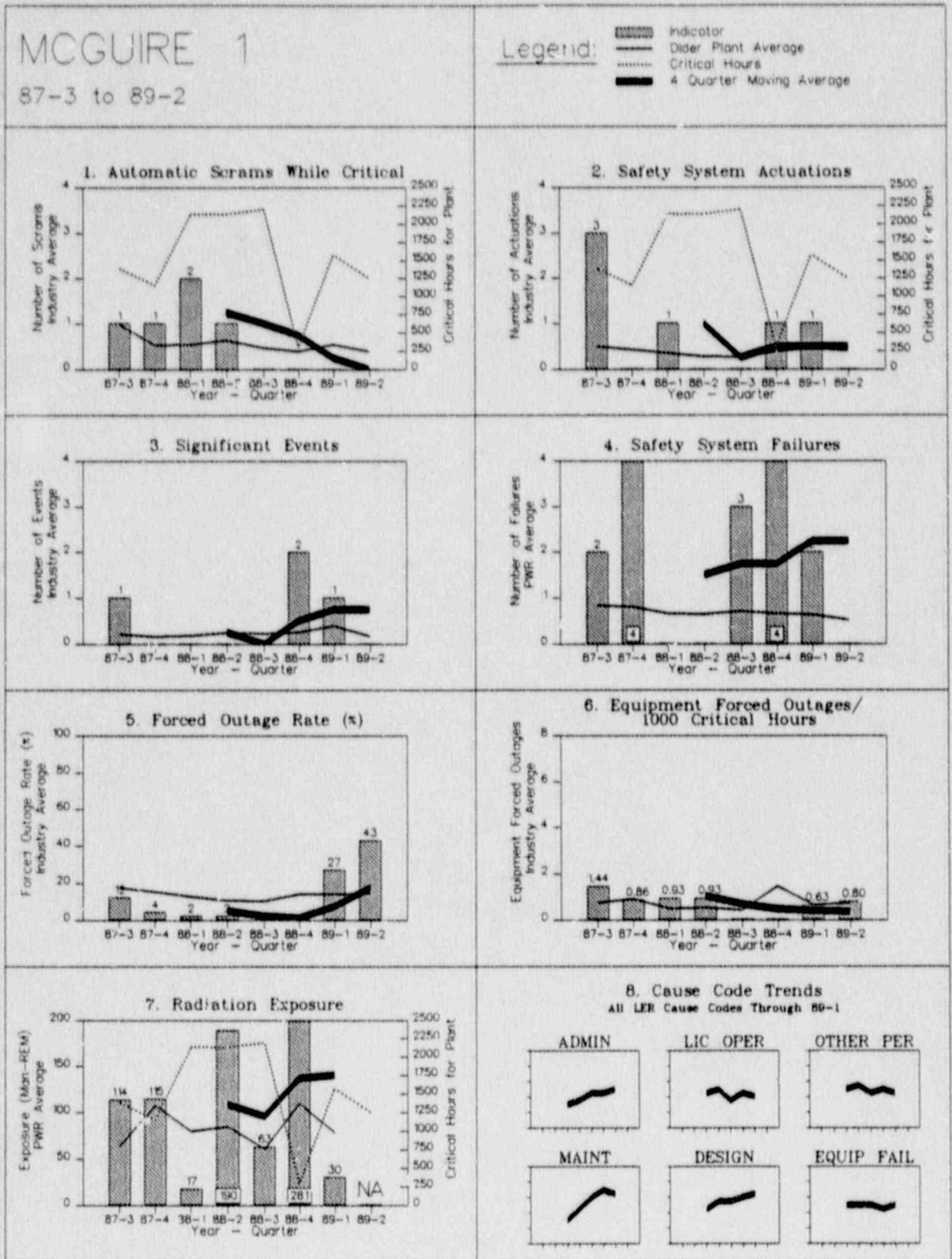


FIGURE 4.51

MCGUIRE 1

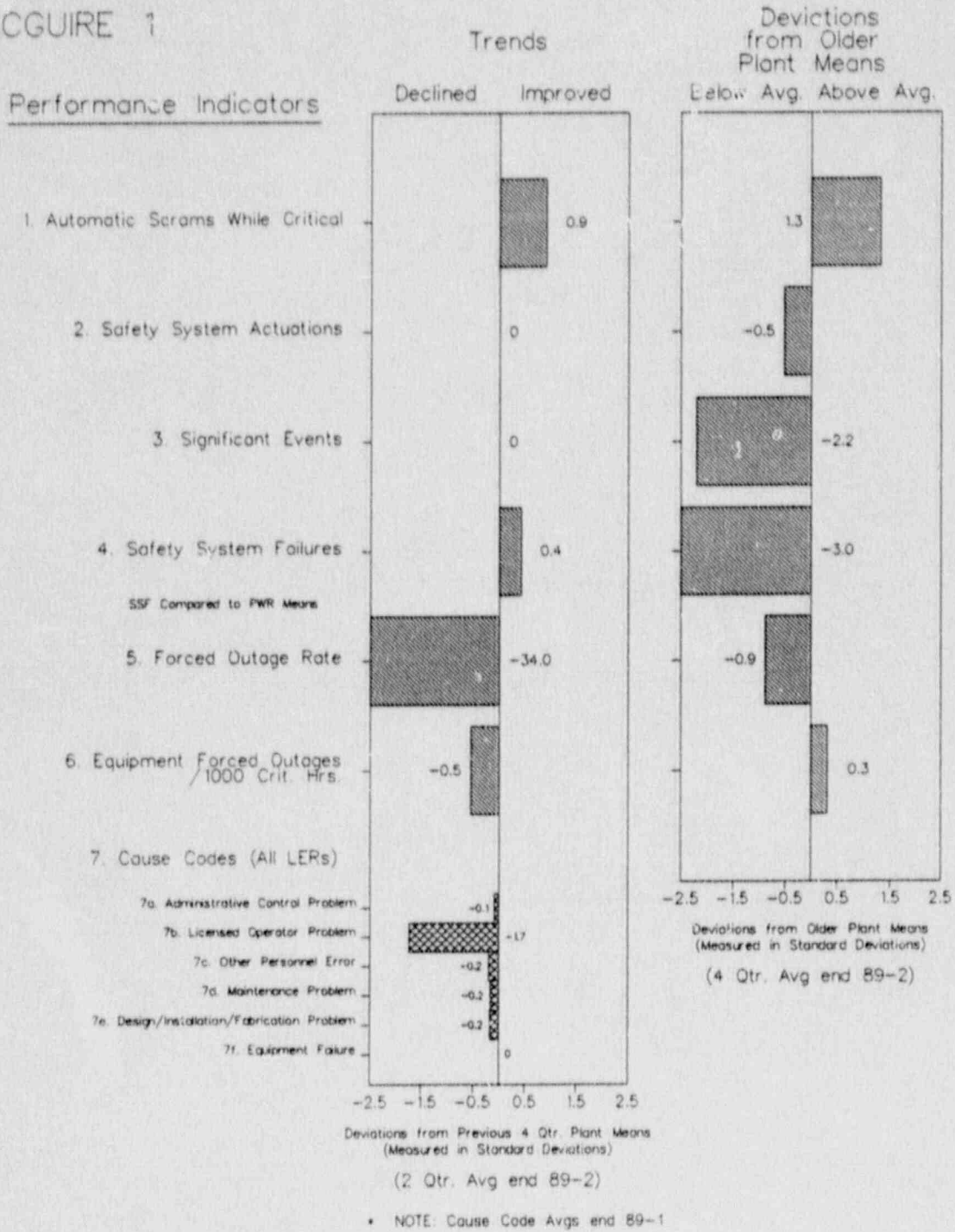


FIGURE 4.52

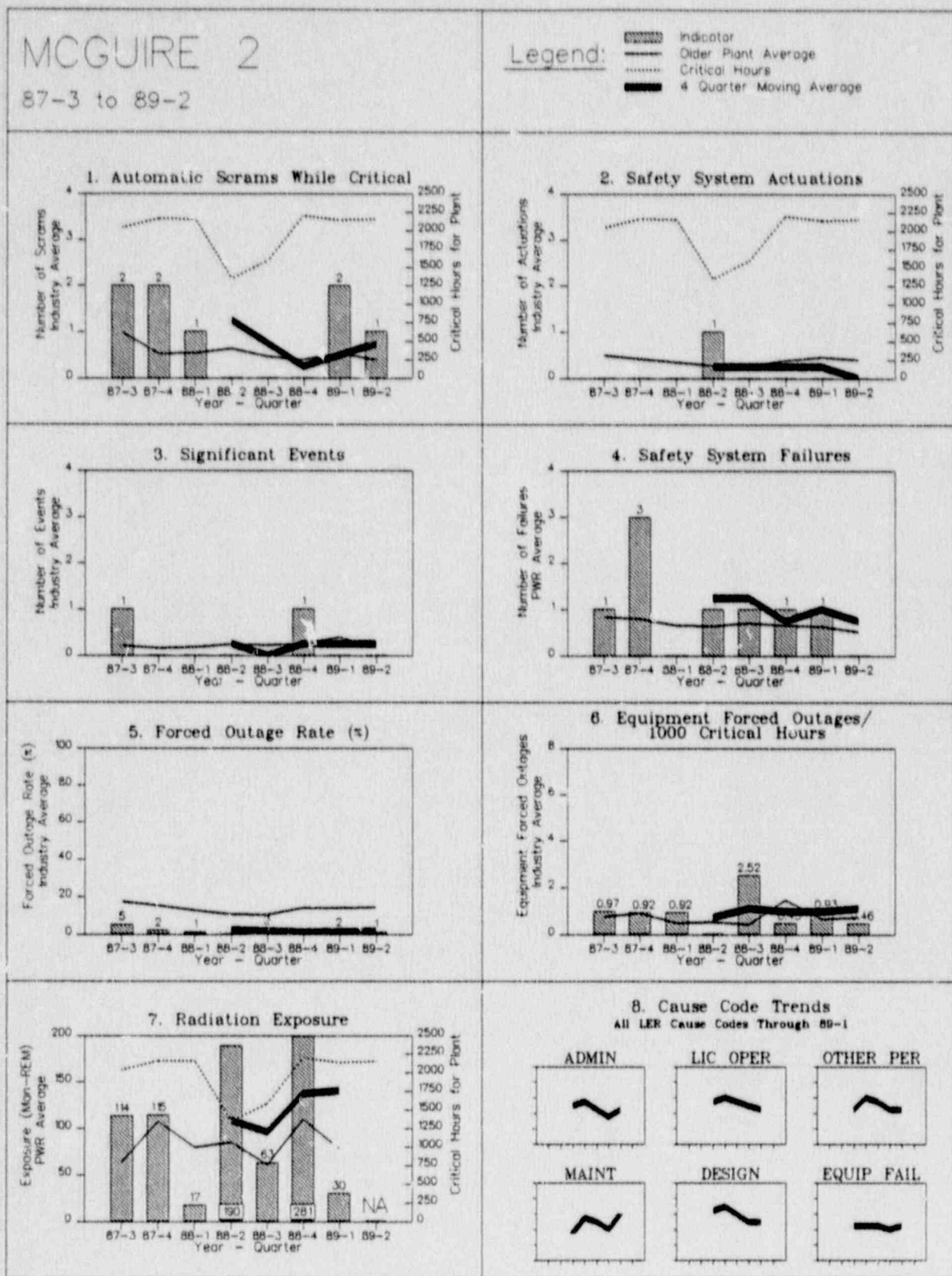


FIGURE 4.52

MCGUIRE 2

Performance Indicators

Trends

Declined Improved

1. Automatic Scrams While Critical

-2.9

2. Safety System Actuations

0.6

3. Significant Events

0.8

4. Safety System Failures

0.6

SSF Compared to PWR Means

5. Forced Outage Rate

-0.4

6. Equipment Forced Outages /1000 Crit. Hrs.

0.3

7. Cause Codes (All LERs)

7a. Administrative Control Problem

0.7

7b. Licensed Operator Problem

0.7

7c. Other Personnel Error

1.1

7d. Maintenance Problem

0.2

7e. Design/Installation/Fatigue Problem

1.2

7f. Equipment Failure

-0.6

Deviations from Previous 4 Qtr. Plant Means (Measured in Standard Deviations)

(2 Qtr. Avg end 89-2)

\* NOTE: Cause Code Avgs end 89-1

Deviations from Older Plant Means

Below Avg. Above Avg.

-1.0

1.1

-0.1

-0.2

0.7

-0.7

-2.5 -1.5 -0.5 0.5 1.5 2.5

Deviations from Older Plant Means (Measured in Standard Deviations)

(4 Qtr. Avg end 89-2)

FIGURE 4.53

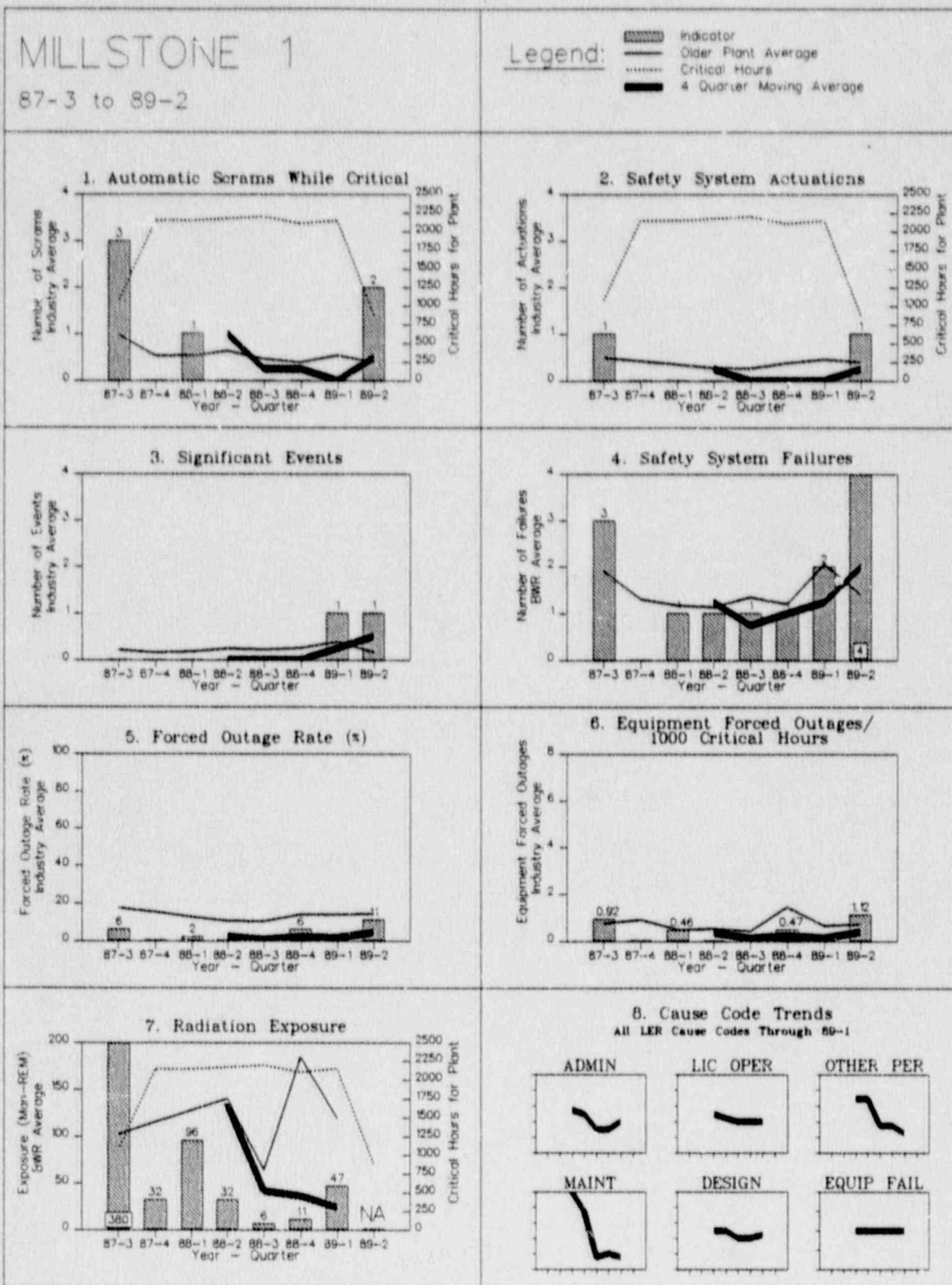


FIGURE 4.53

MILLSTONE 1

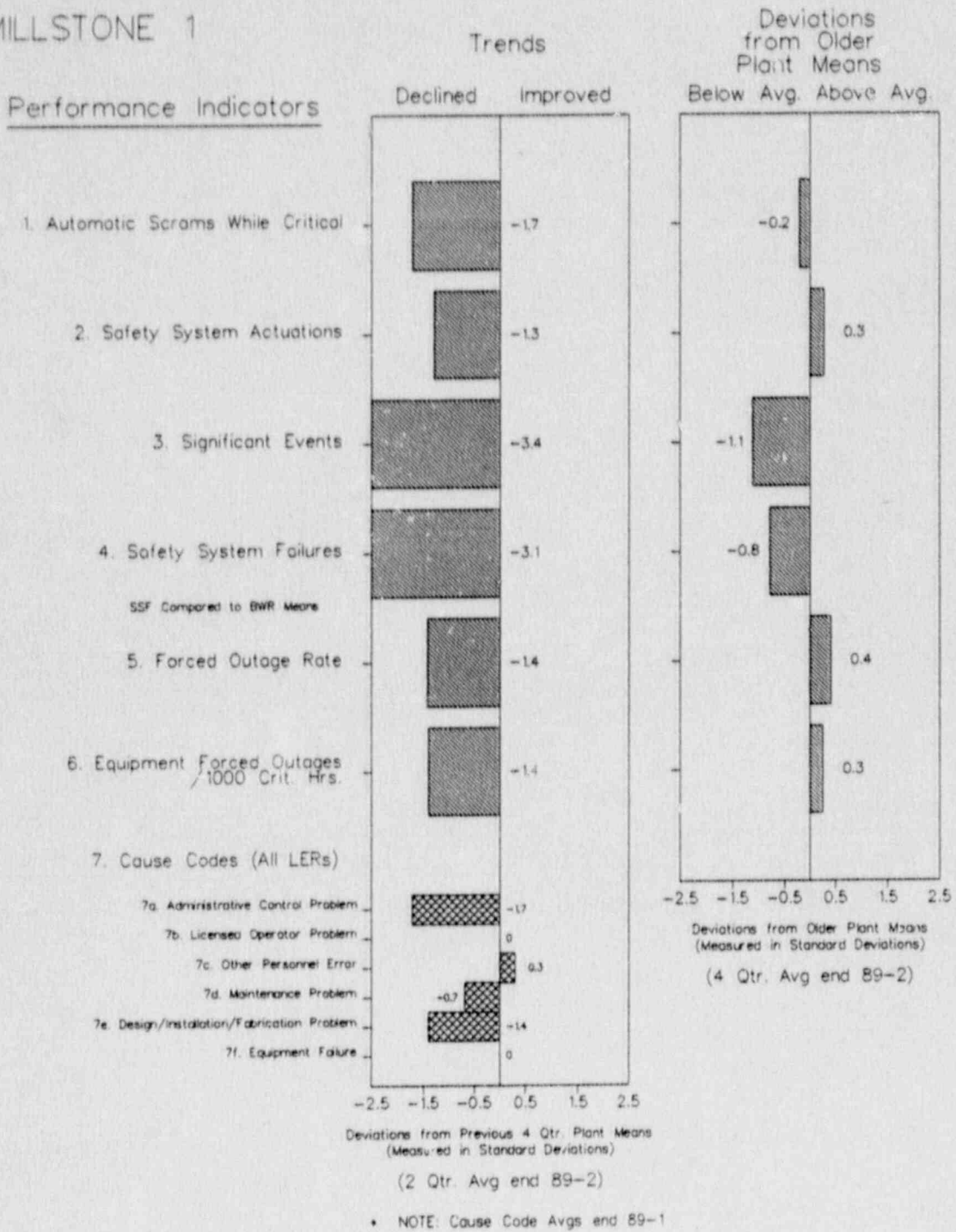


FIGURE 4.54

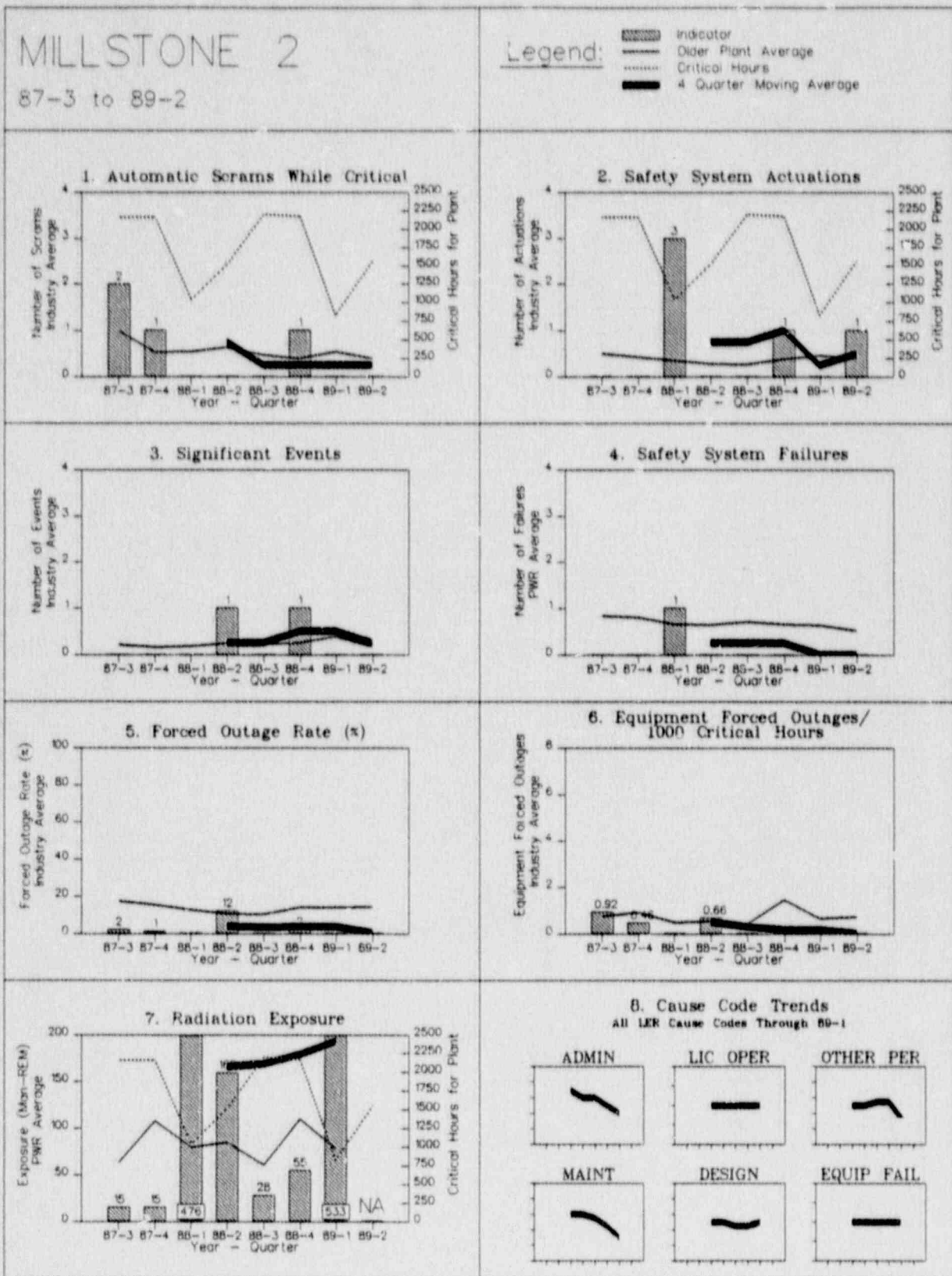
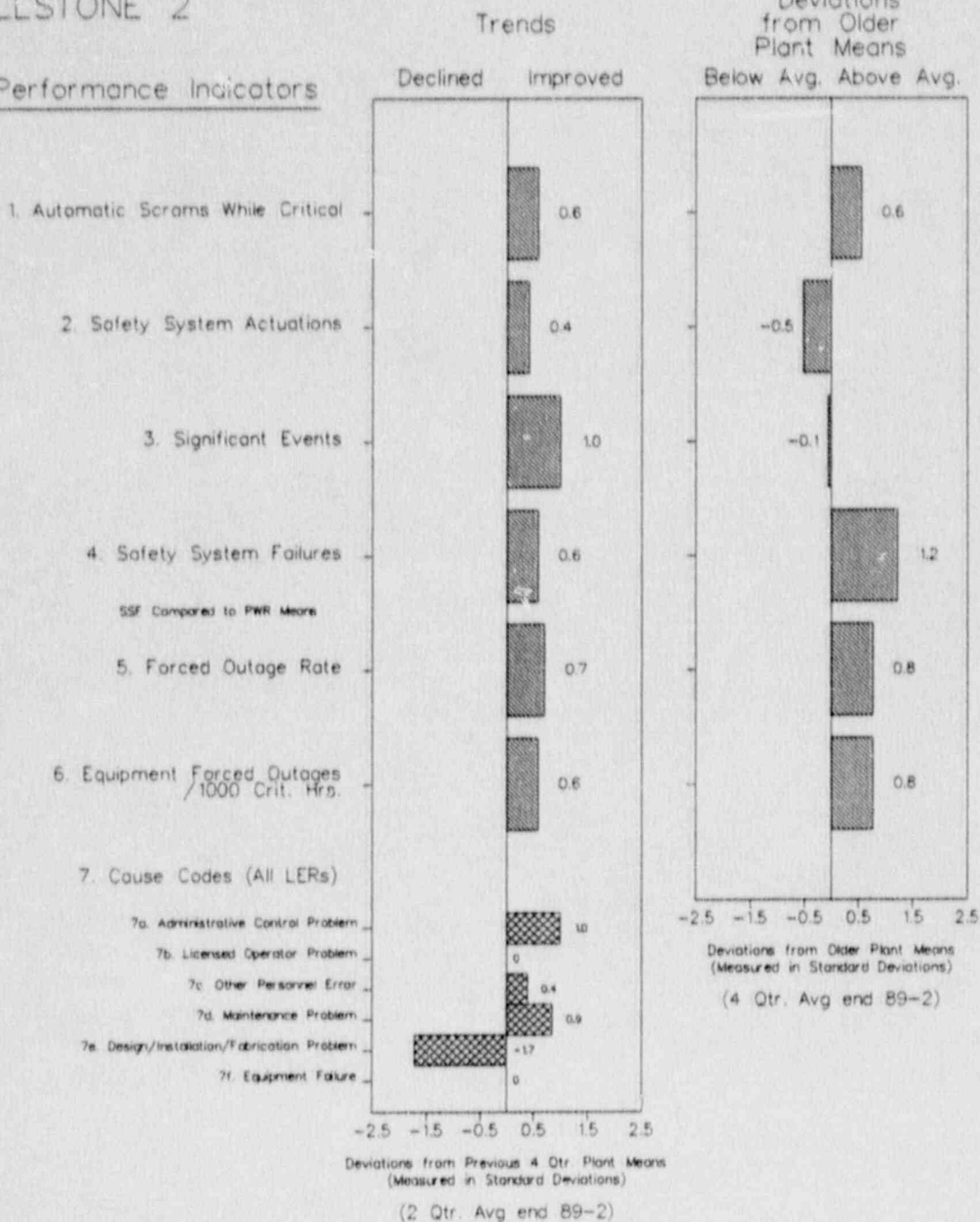




FIGURE 4.54

MILLSTONE 2

Performance Indicators



\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.55

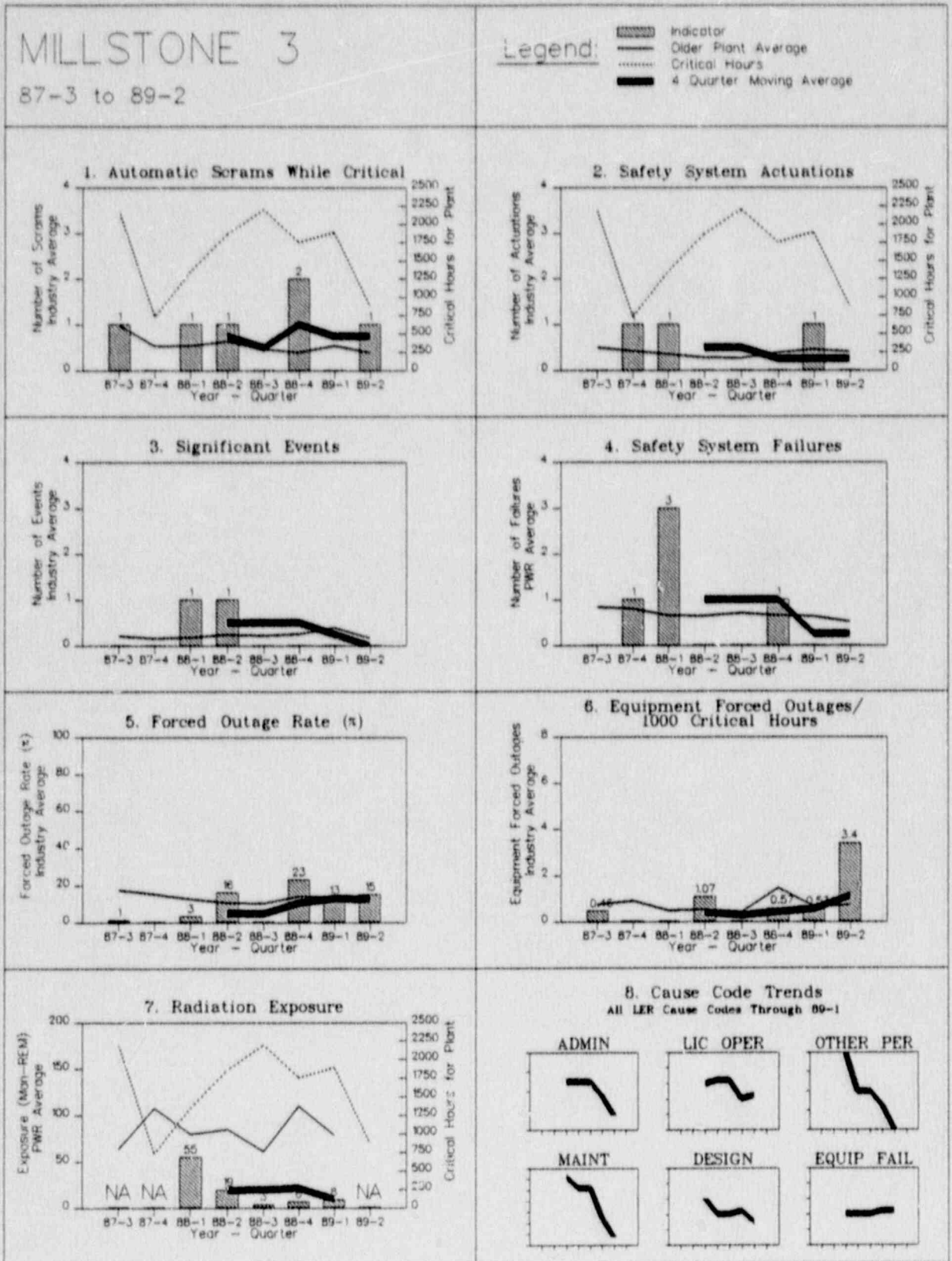


FIGURE 4.55

MILLSTONE 3

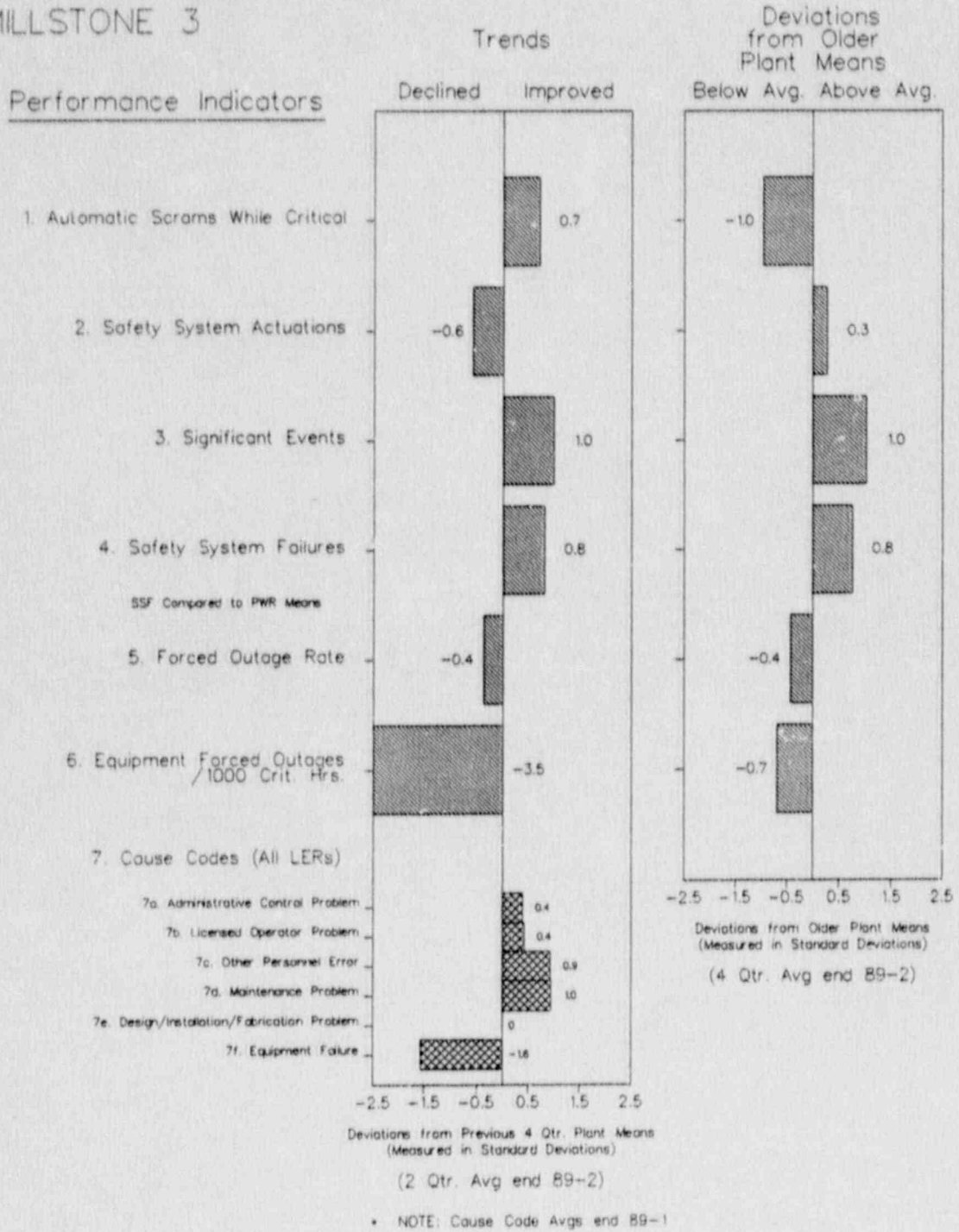


FIGURE 4.56

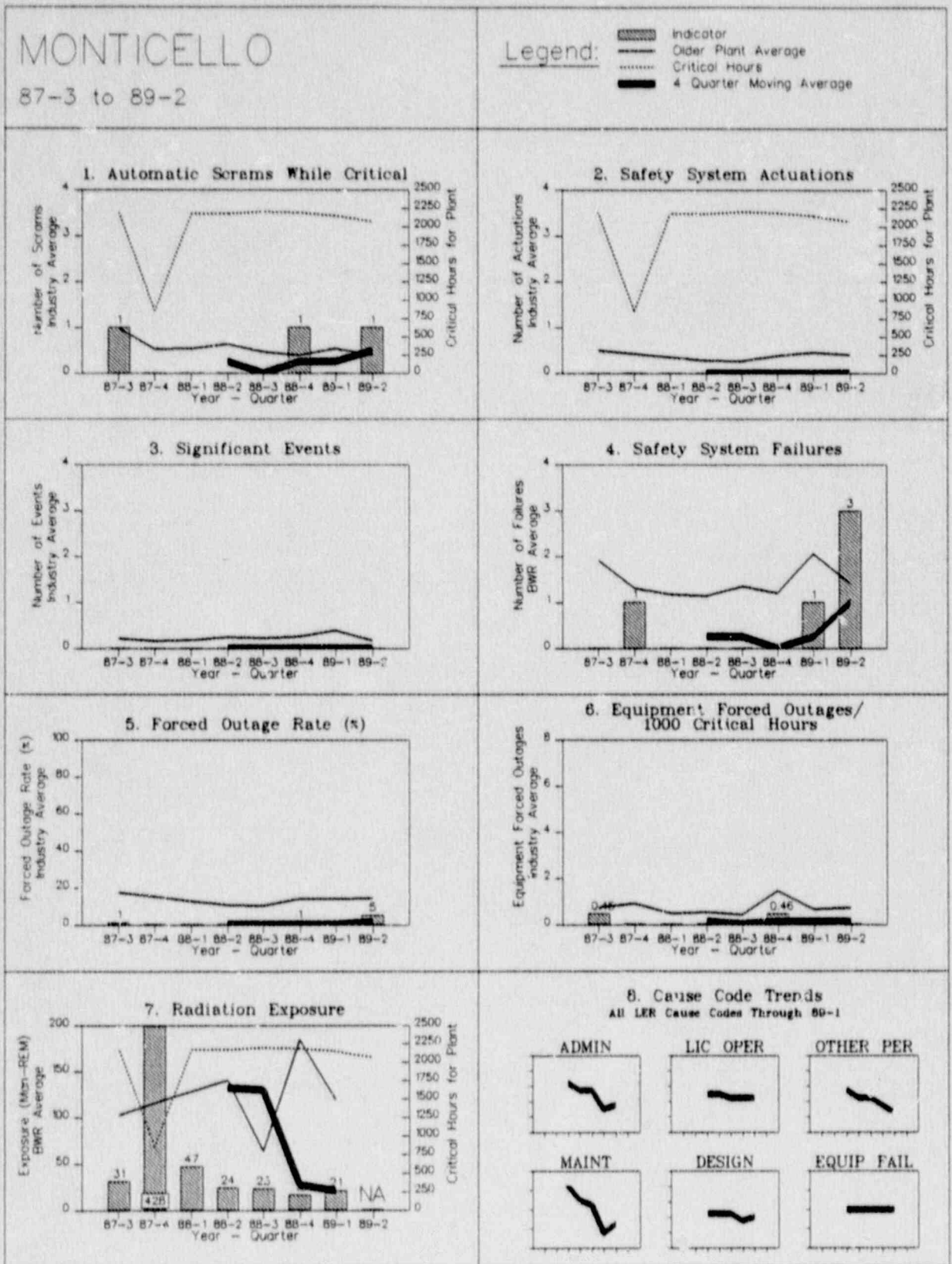
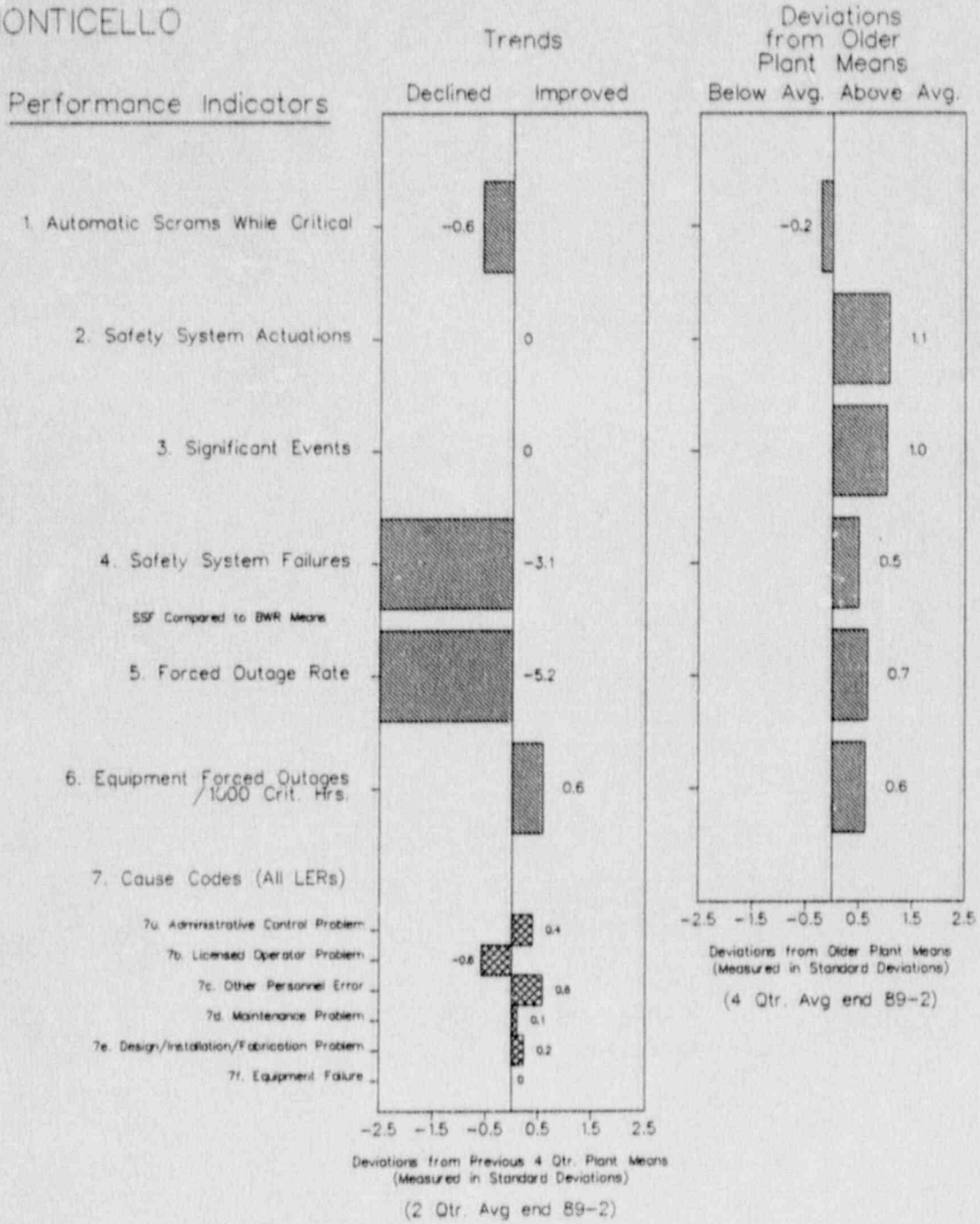


FIGURE 4.56

MONTICELLO



\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.57

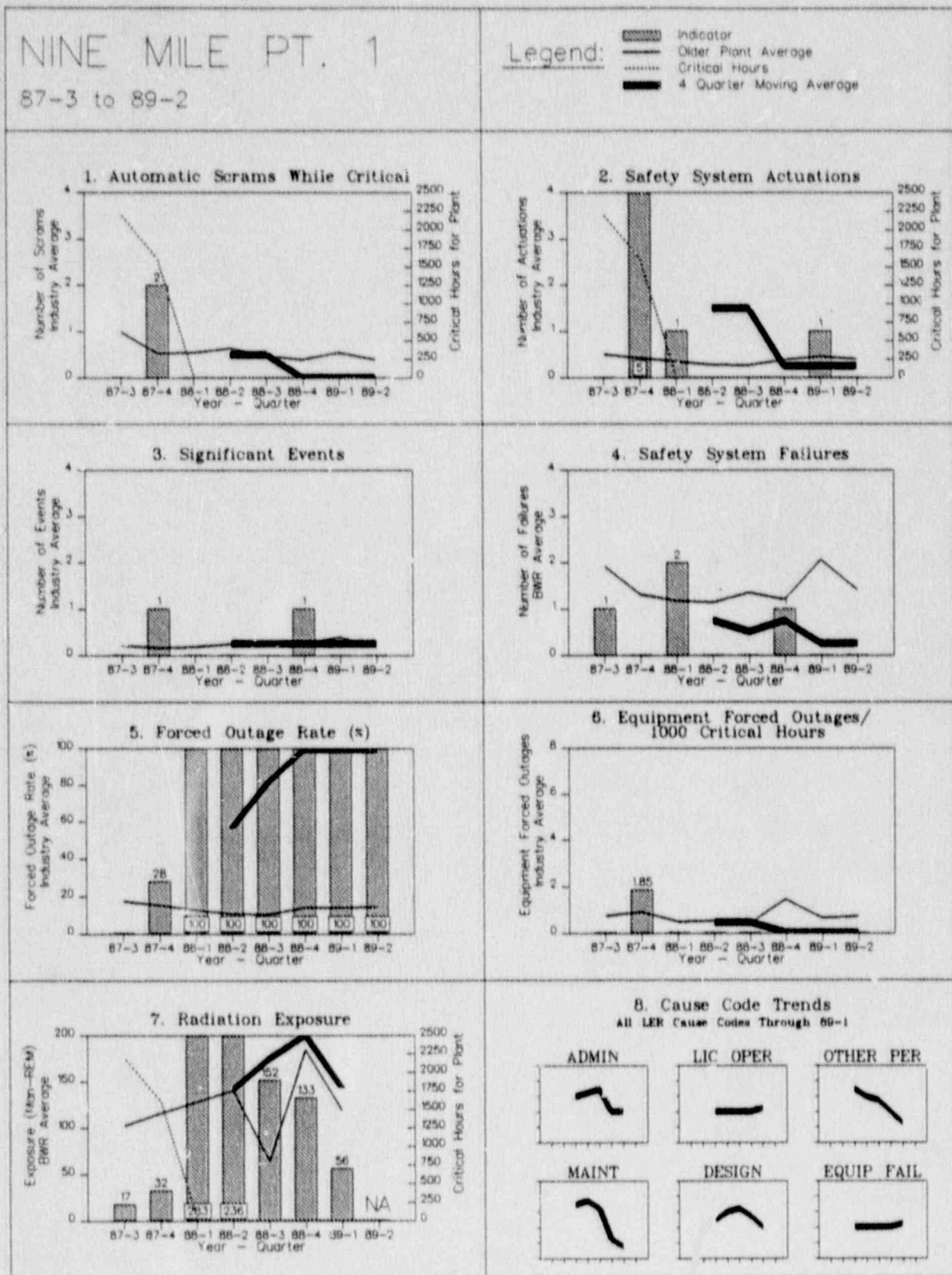
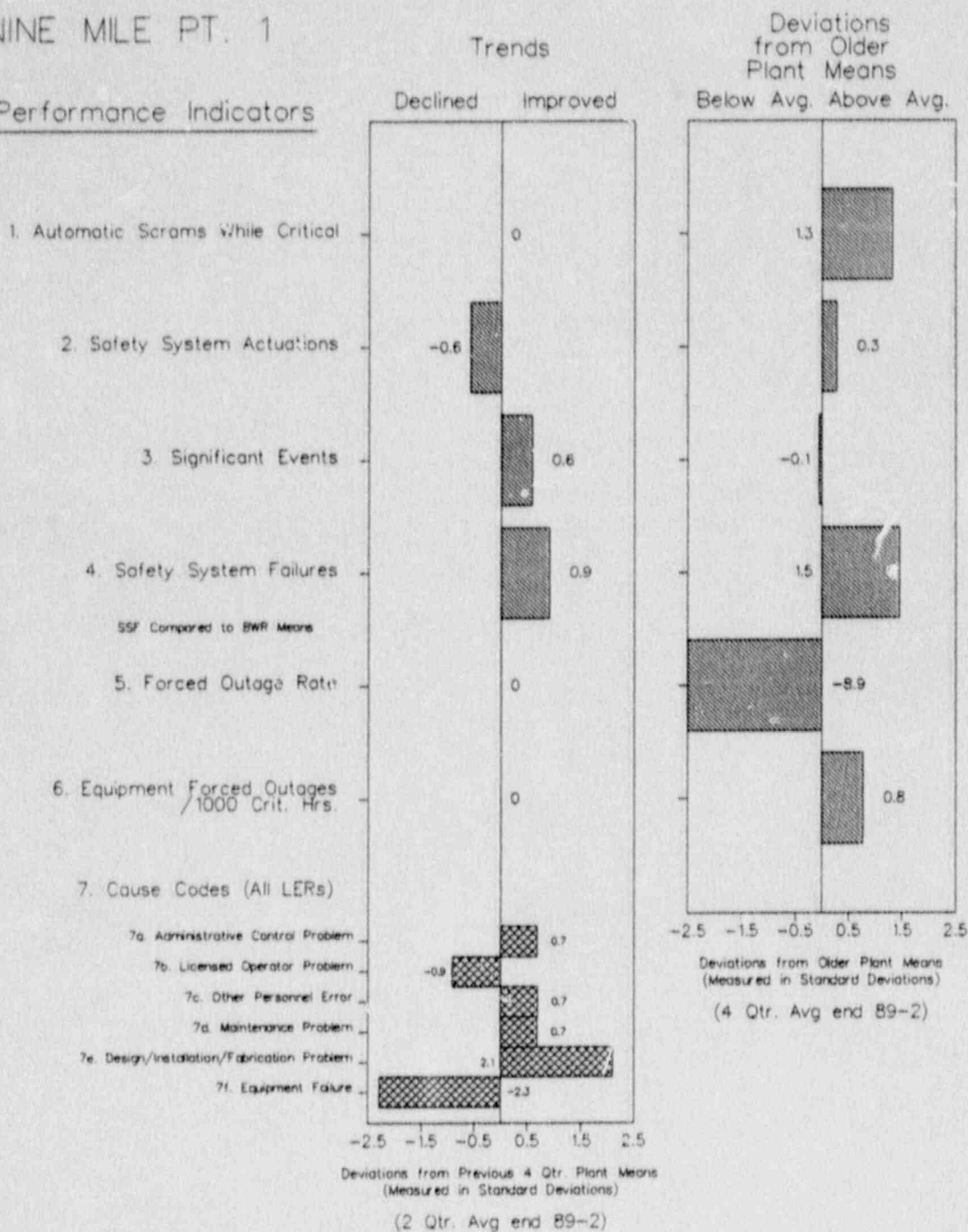


FIGURE 4.57

NINE MILE PT. 1

Performance Indicators



\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.58

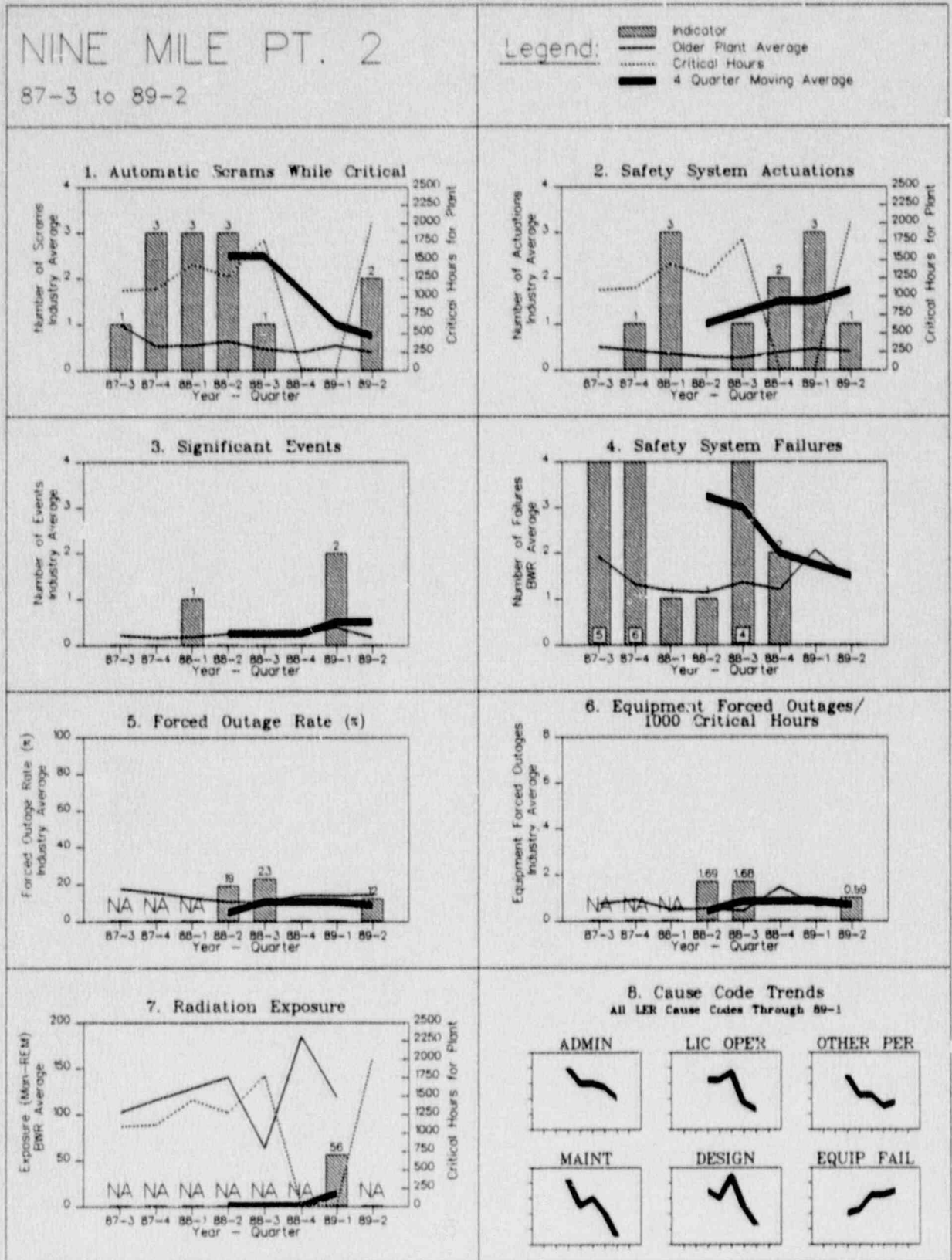




FIGURE 4.58

NINE MILE PT. 2

Performance Indicators

Trends

Declined Improved

Deviations from Older Plant Means

Below Avg. Above Avg.

1. Automatic Scrams While Critical

0.6

-1.0

2. Safety System Actuations

-0.5

-4.5

3. Significant Events

-1.7

-1.1

4. Safety System Failures

1.6

-0.2

SSF Compared to BWR Means

5. Forced Outage Rate

0.8

-0.0

6. Equipment Forced Outages /1000 Crit. Hrs.

0.8

-0.1

7. Cause Codes (All LERs)

7a. Administrative Control Problem

0.7

7b. Licensed Operator Problem

0.3

7c. Other Personnel Error

0.1

7d. Maintenance Problem

0.8

7e. Design/Installation/Fabrication Problem

0.3

7f. Equipment Failure

0.5

-2.5 -1.5 -0.5 0.5 1.5 2.5

Deviations from Previous 4 Qtr. Plant Means (Measured in Standard Deviations)

(2 Qtr. Avg end 89-2)

-2.5 -1.5 -0.5 0.5 1.5 2.5

Deviations from Older Plant Means (Measured in Standard Deviations)

(4 Qtr. Avg end 89-2)

\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.59

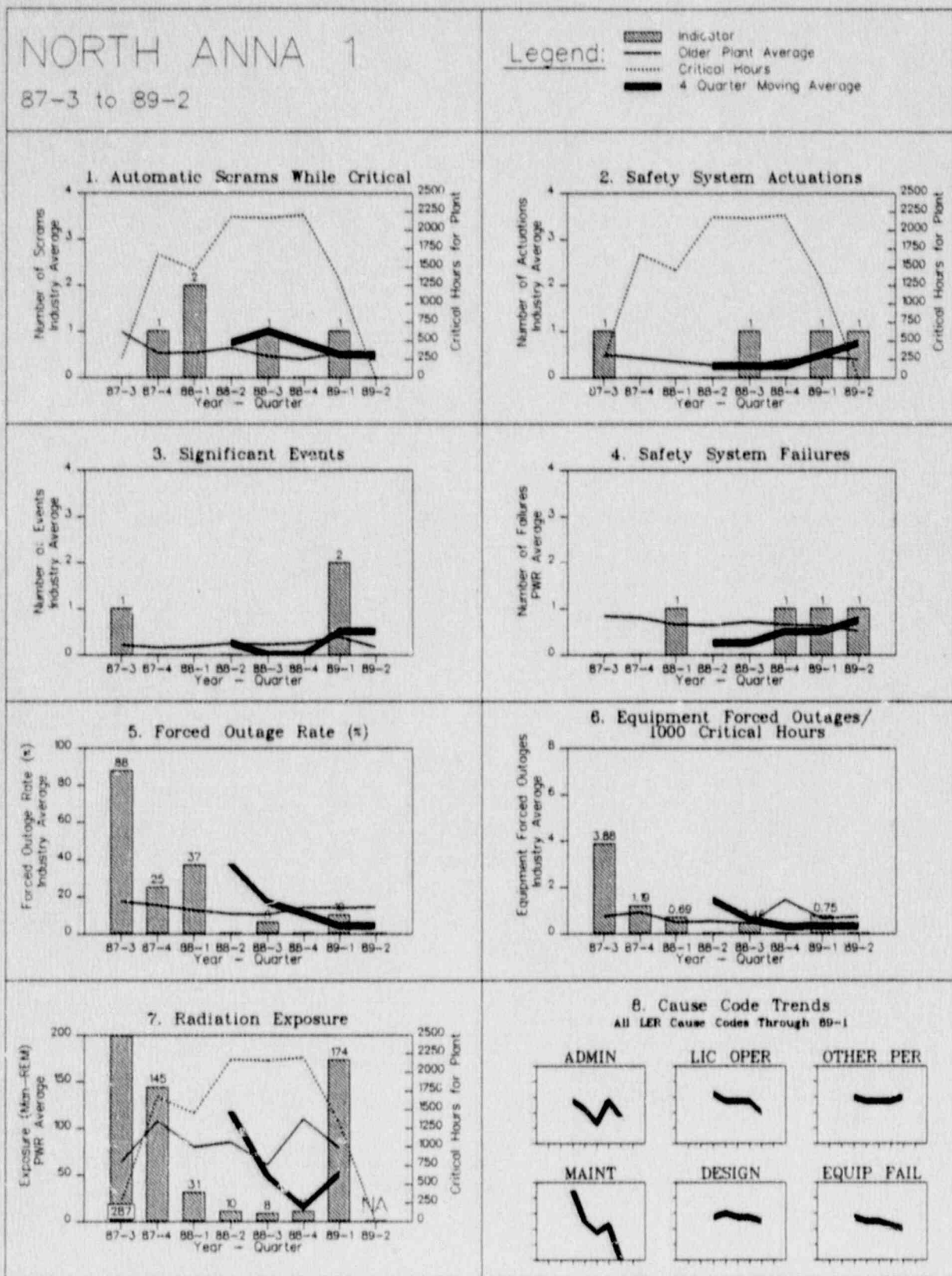
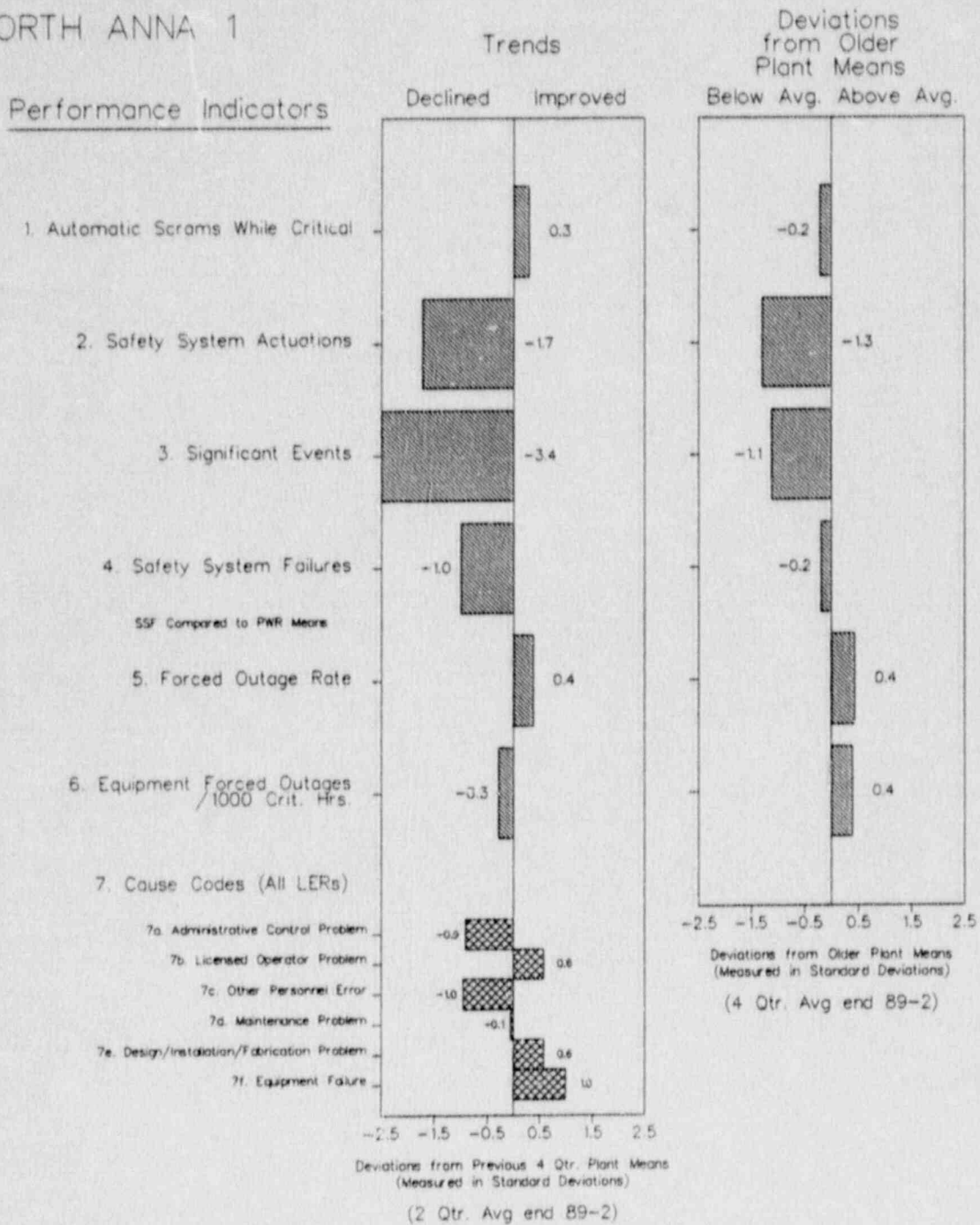


FIGURE 4.59

NORTH ANNA 1



\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.60

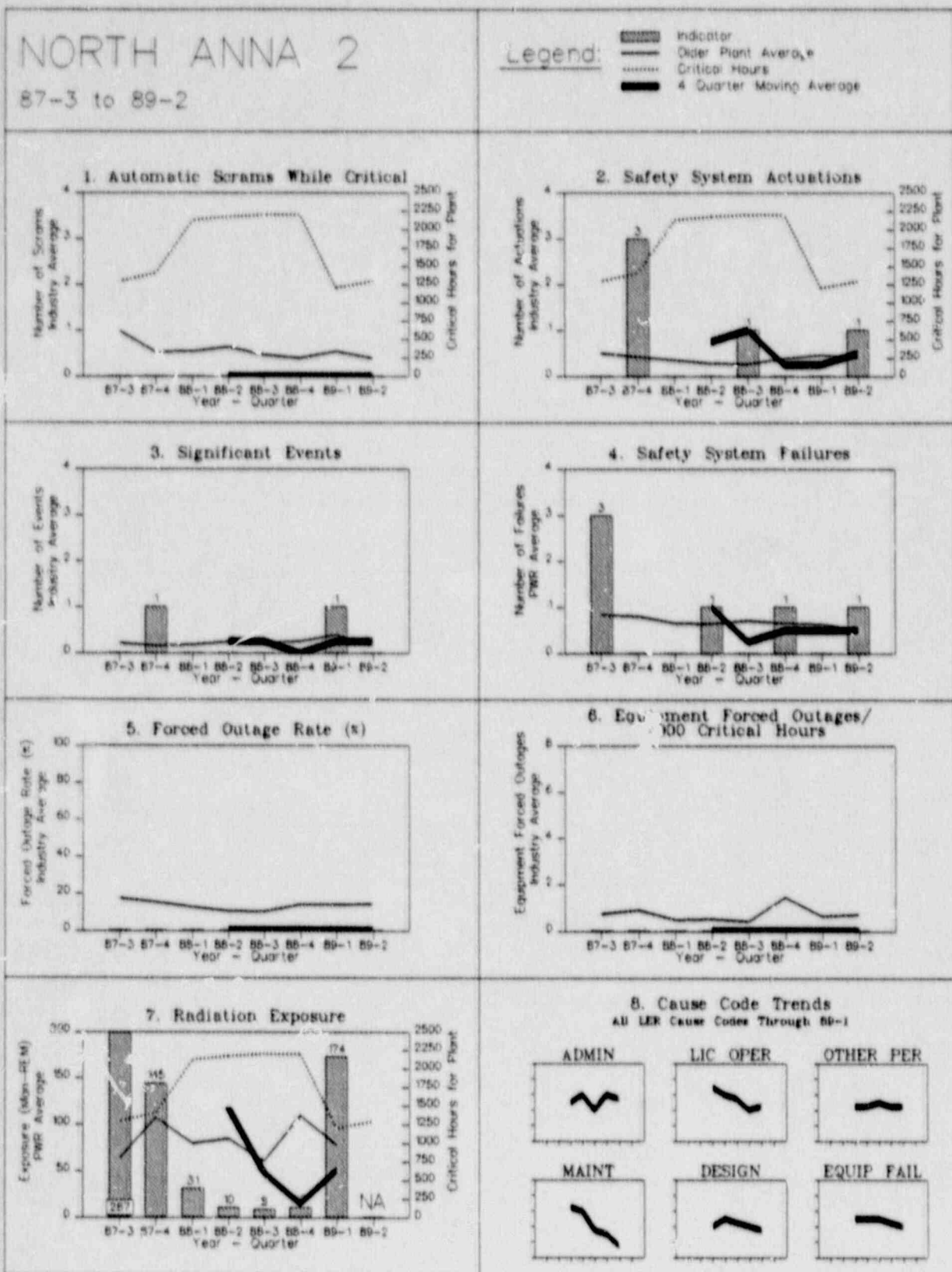


FIGURE 4.60

NORTH ANNA 2

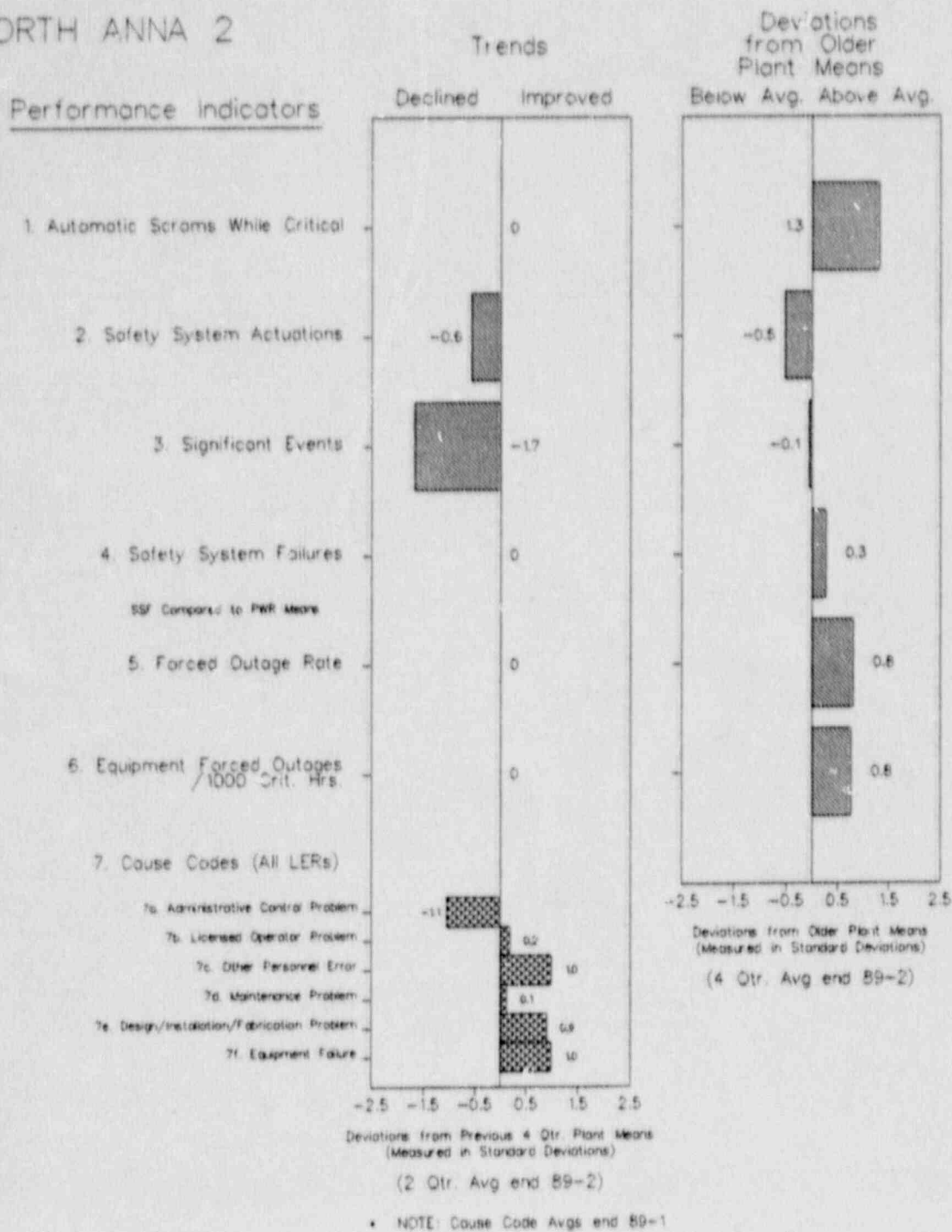


FIGURE 4.61

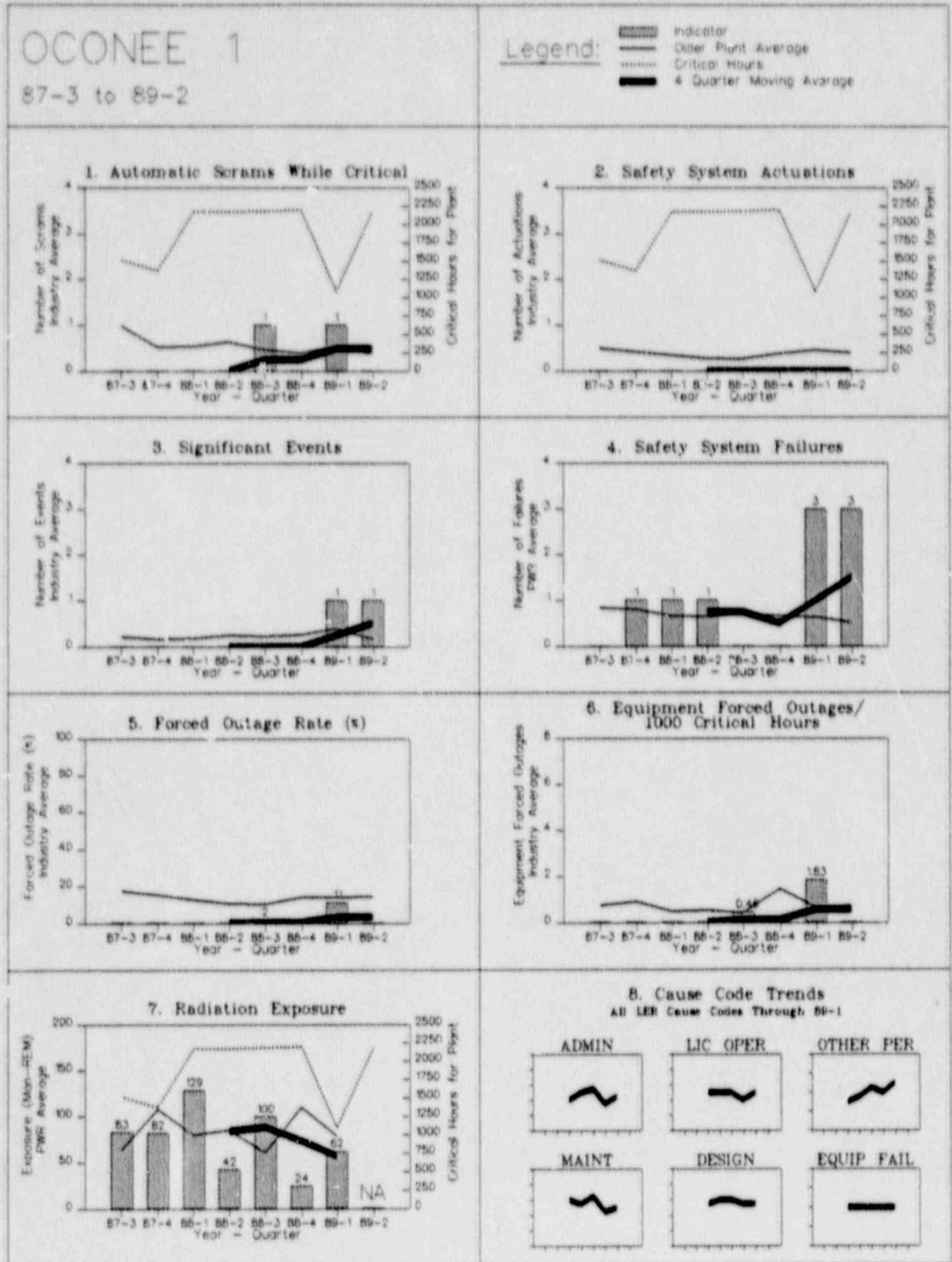


FIGURE 4.61

OCONEE 1

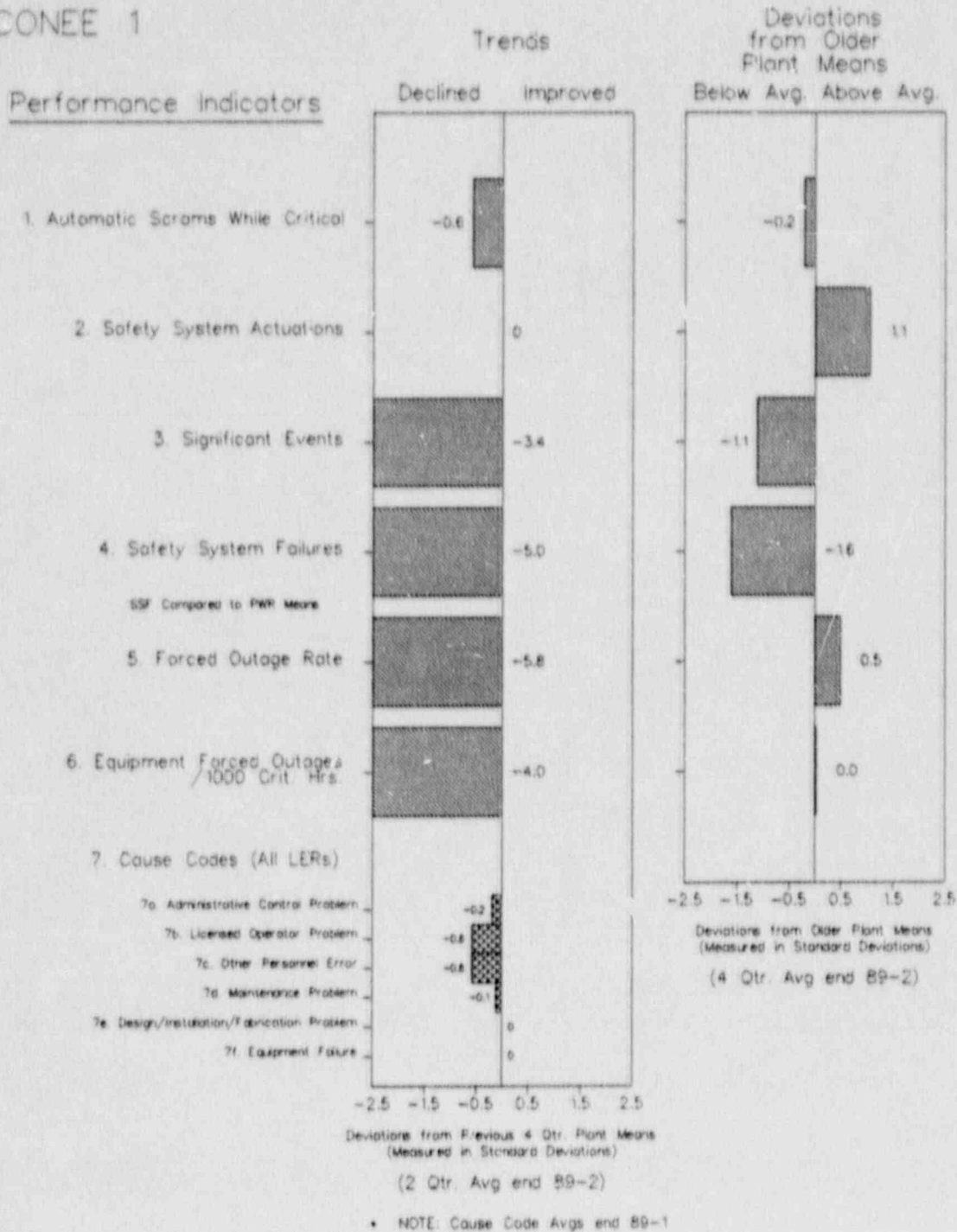


FIGURE 4.62

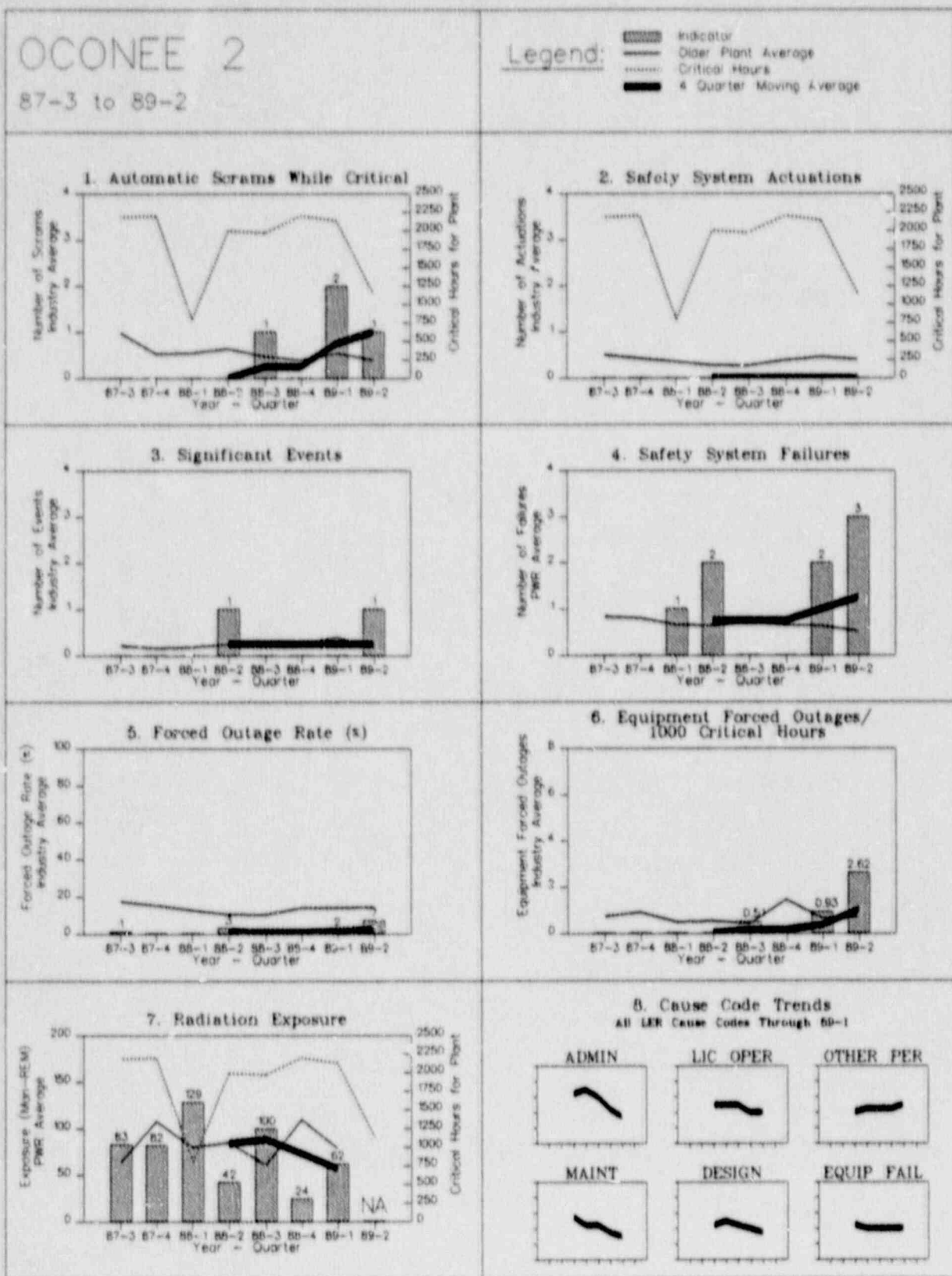




FIGURE 4.62

OCONEE 2

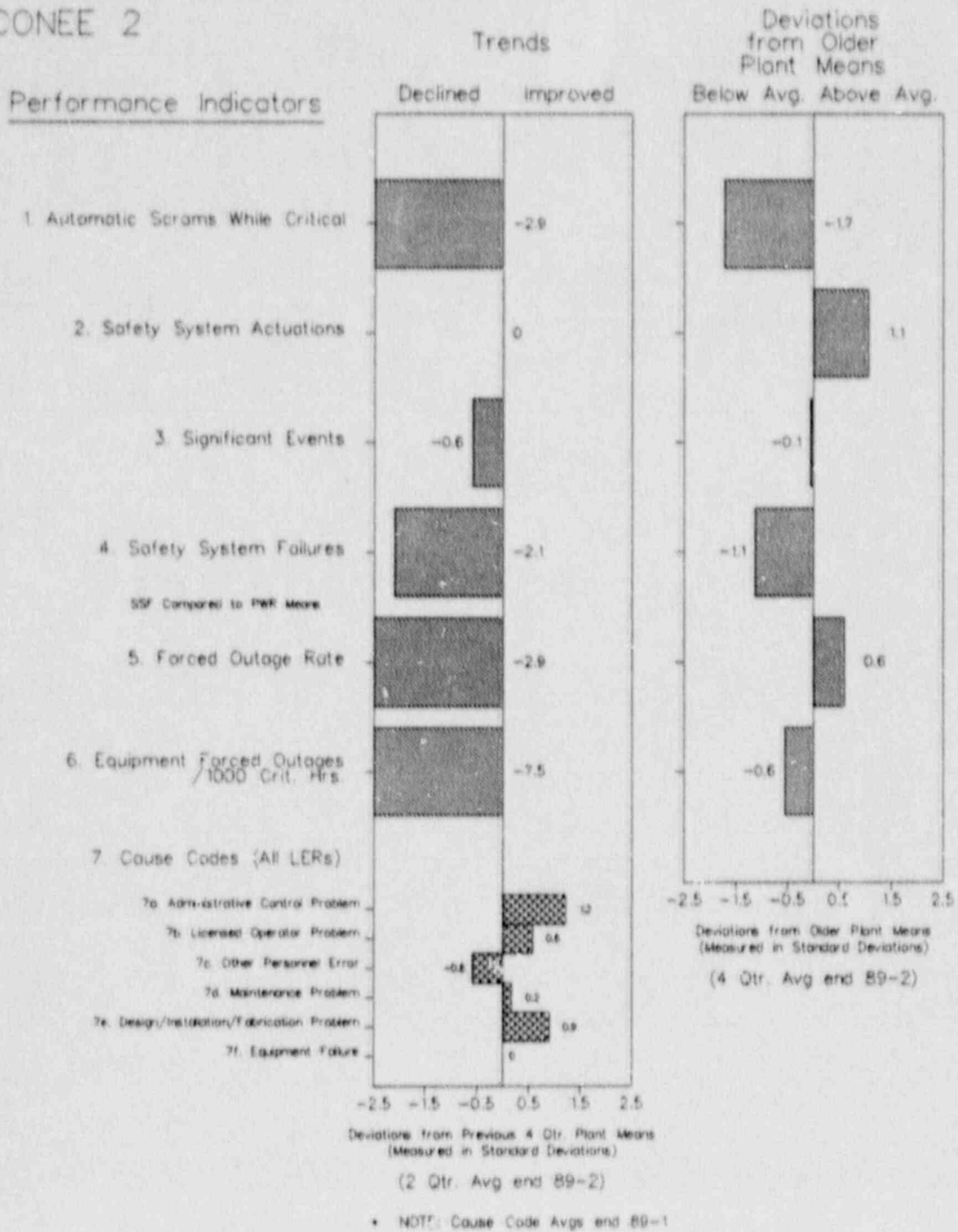


FIGURE 4.63

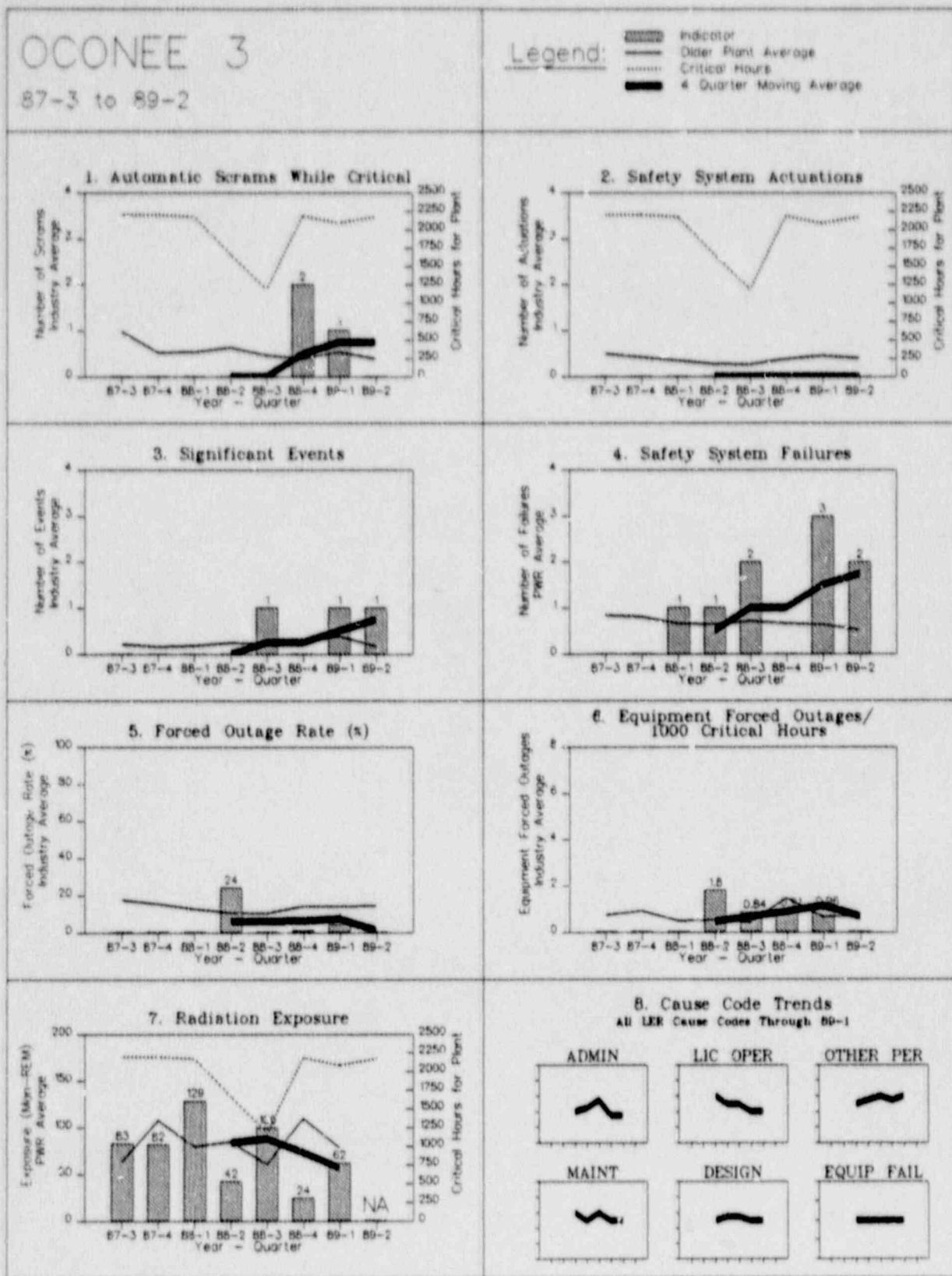
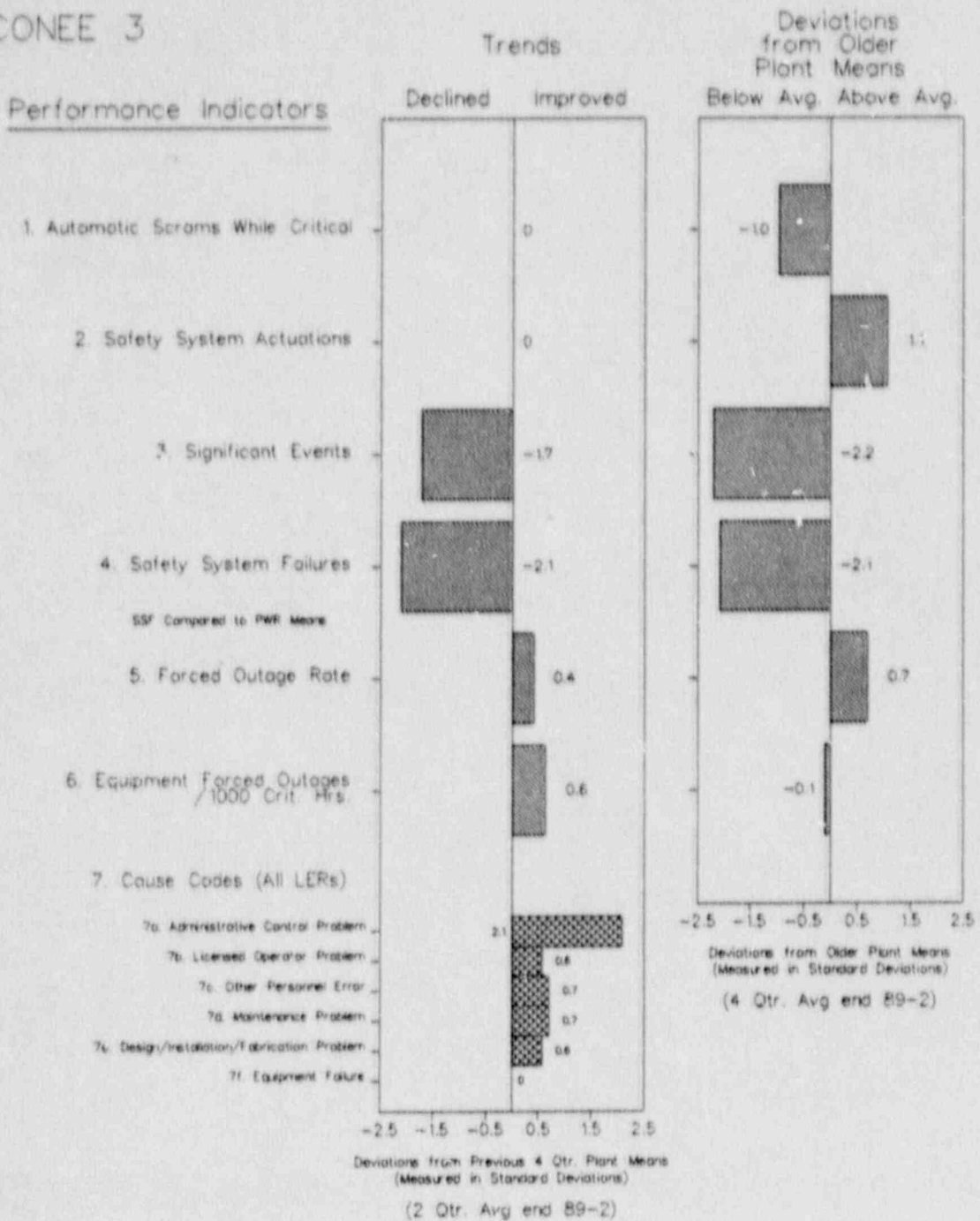


FIGURE 4.63

OCONEE 3



• NOTE: Cause Code Avgs end 89-1

FIGURE 4.64

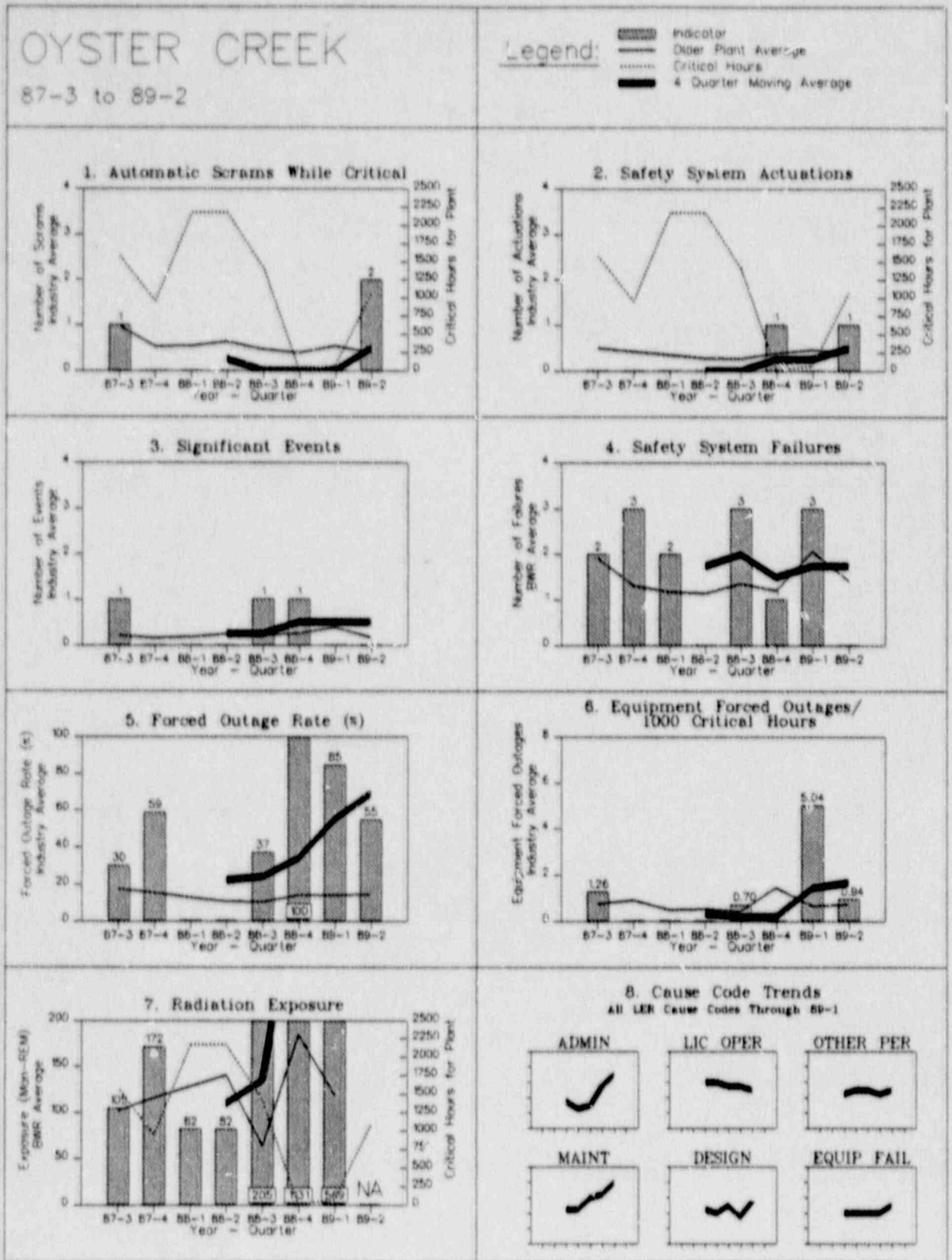


FIGURE 4.64

# OYSTER CREEK

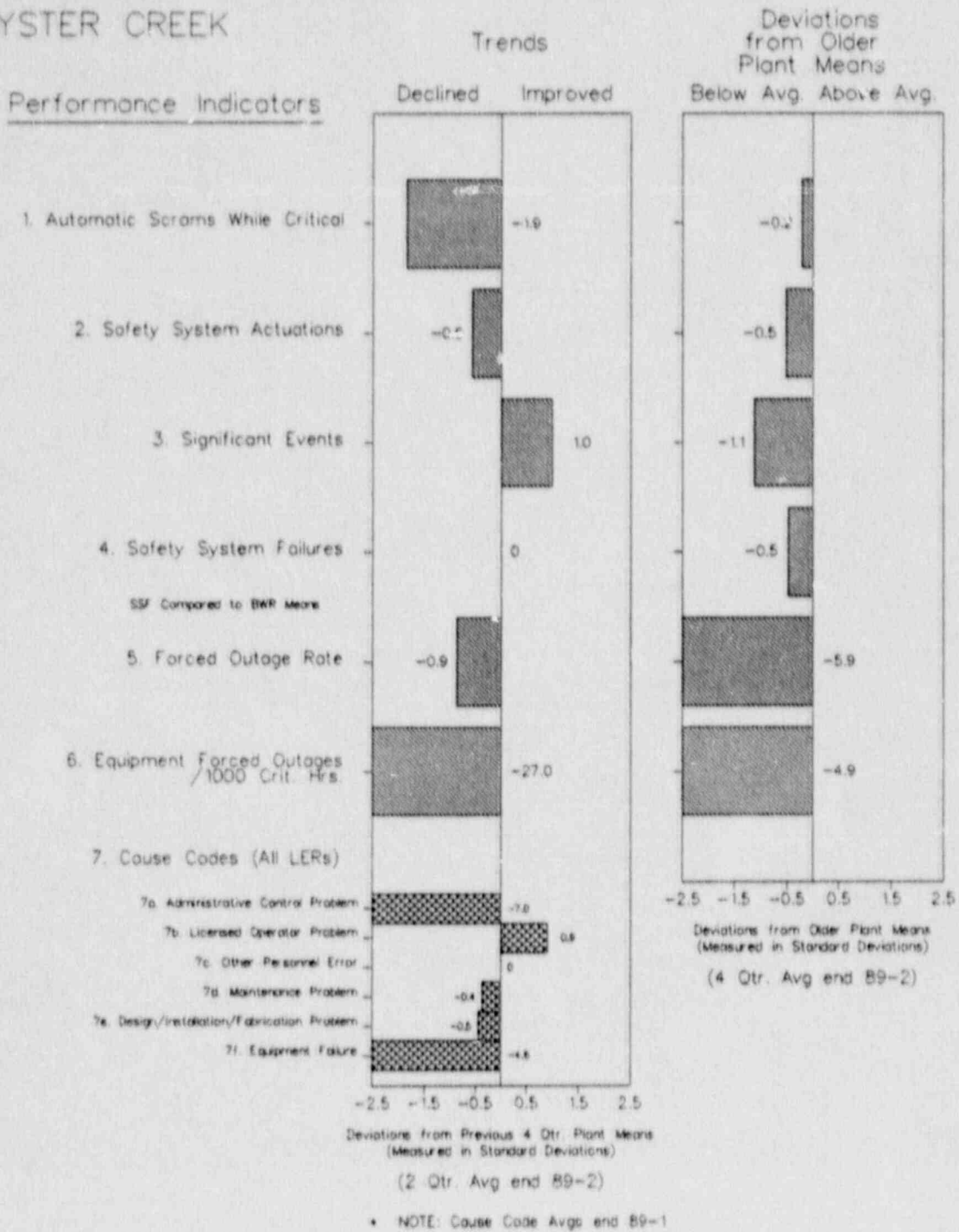


FIGURE 4.65

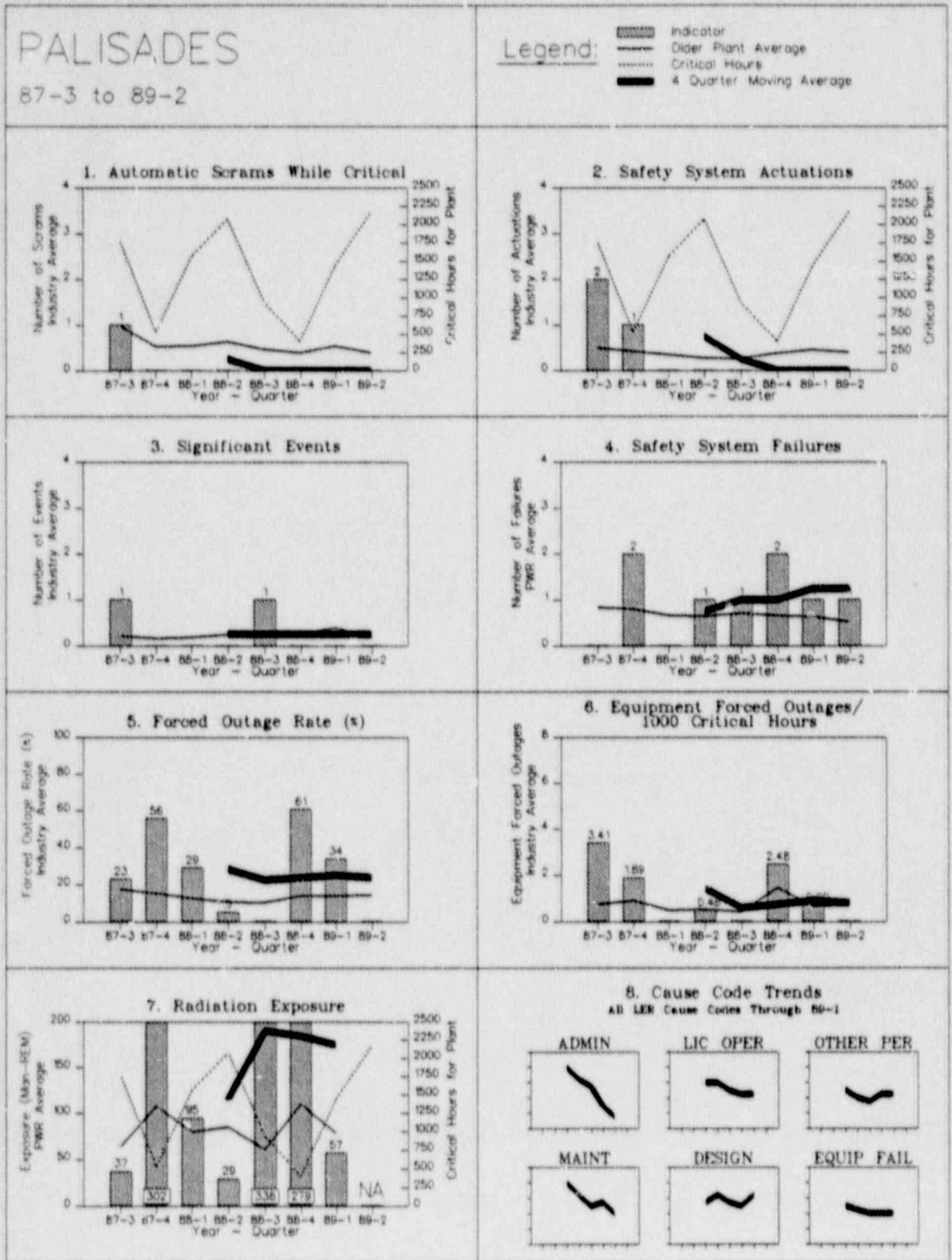


FIGURE 4.65

FALISADES

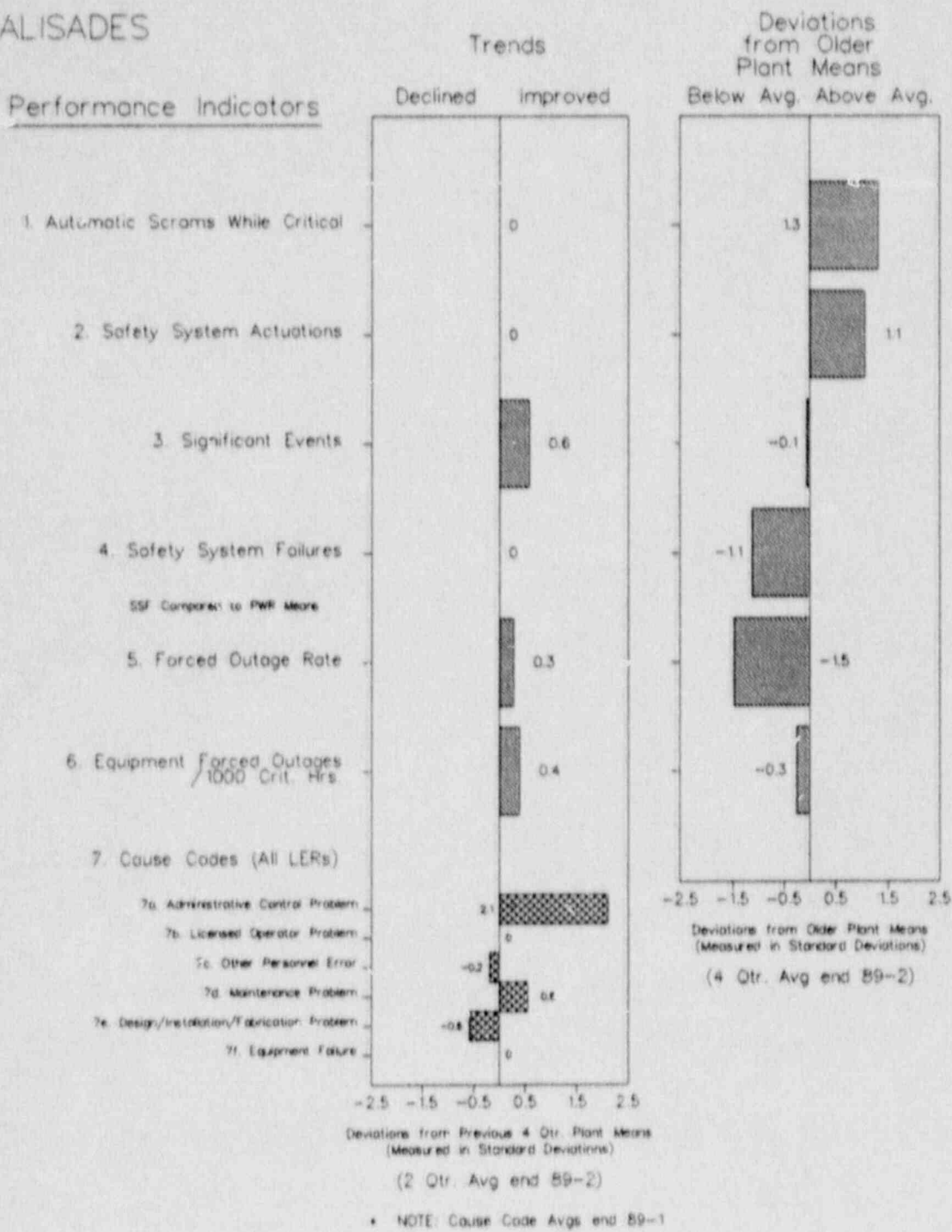


FIGURE 4.66

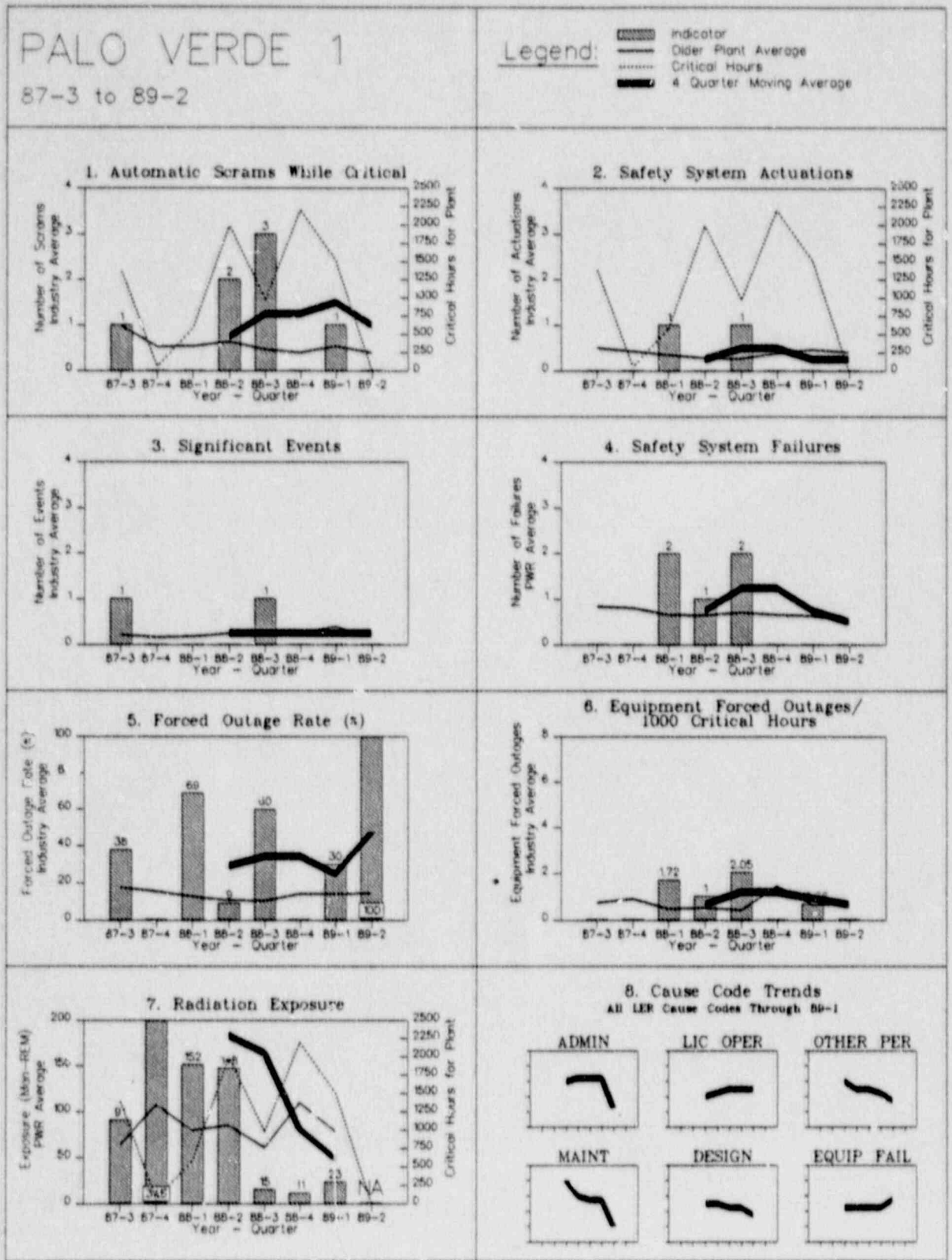




FIGURE 4.66

PALO VERDE 1

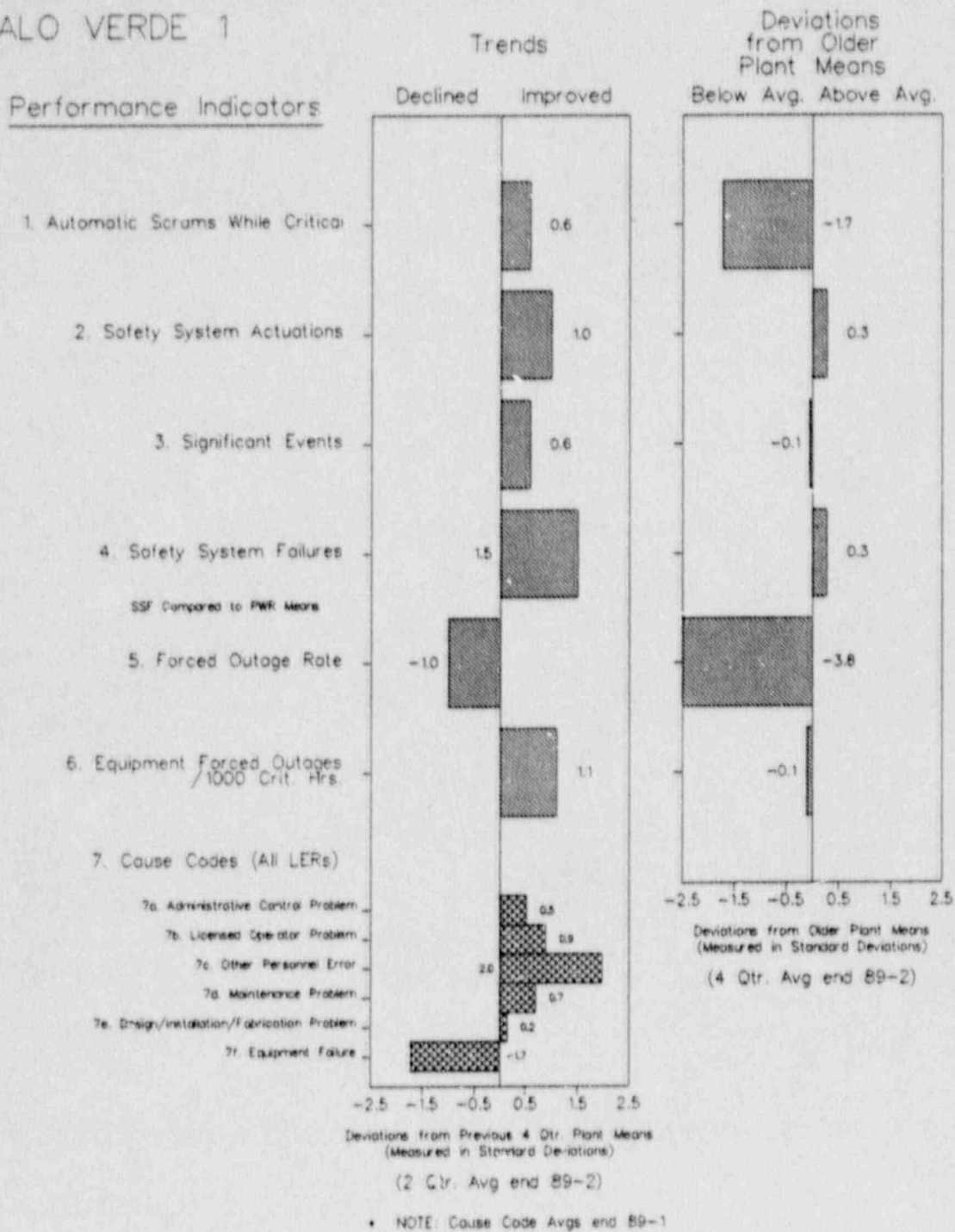


FIGURE 4.67

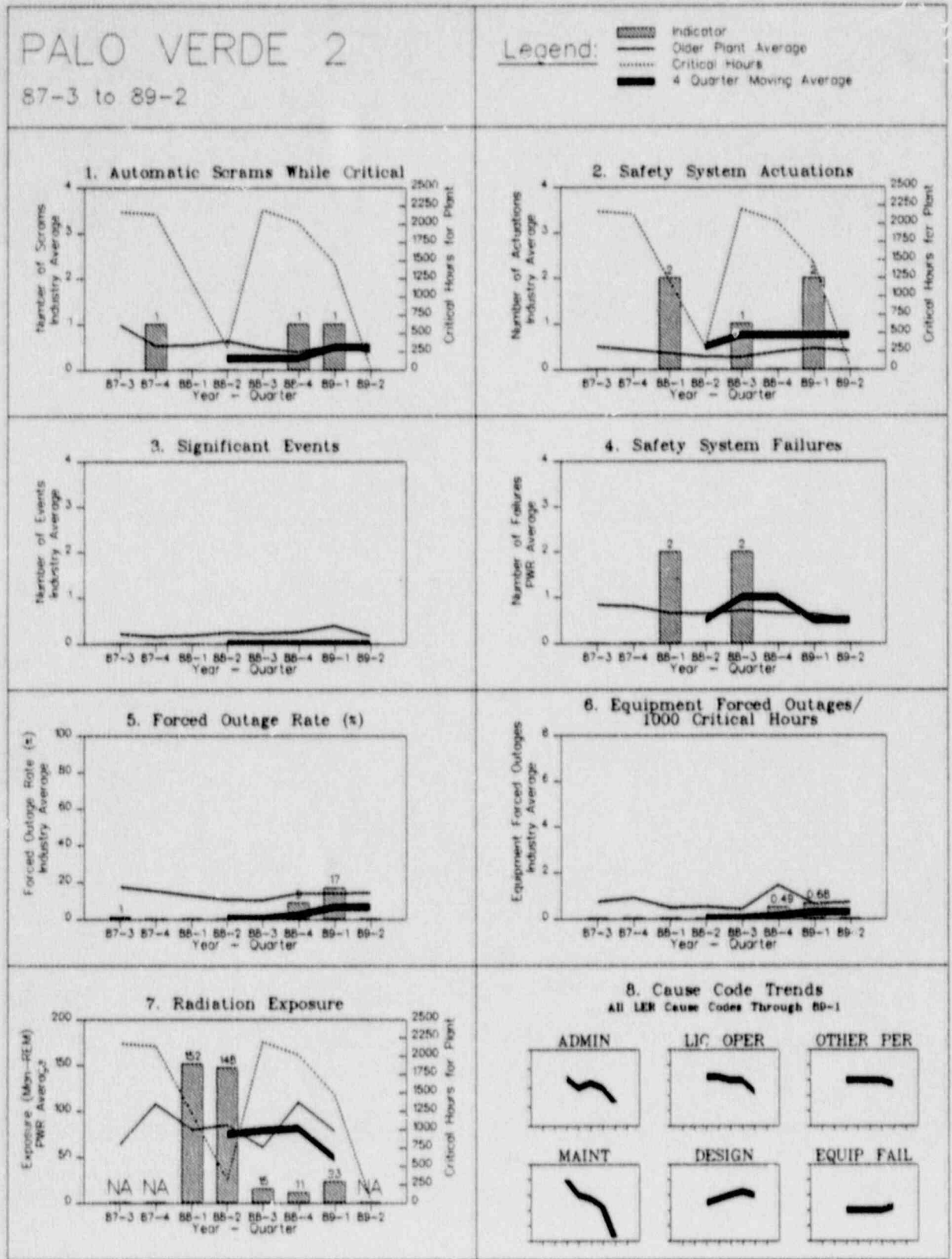


FIGURE 4.67

PALO VERDE 2

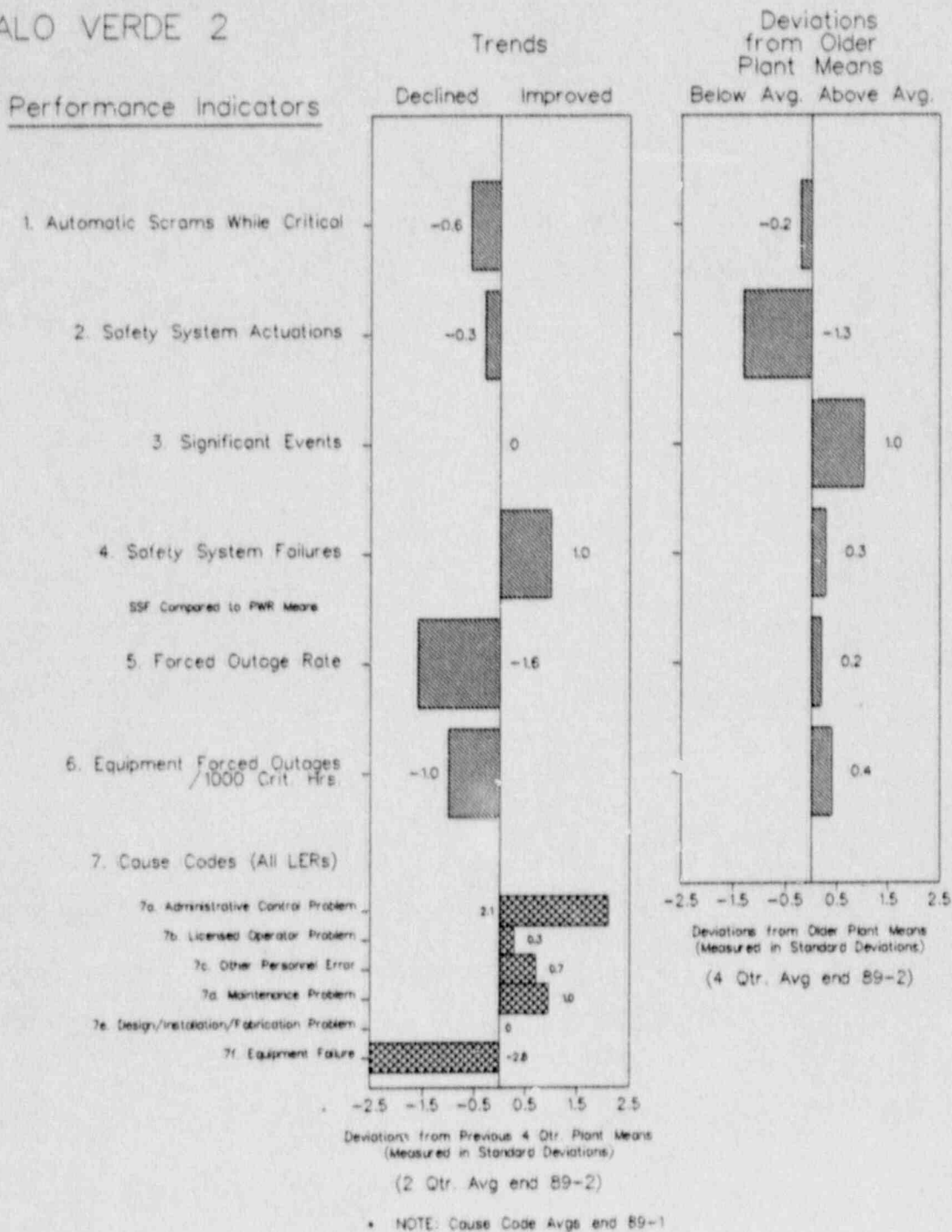


FIGURE 4.68

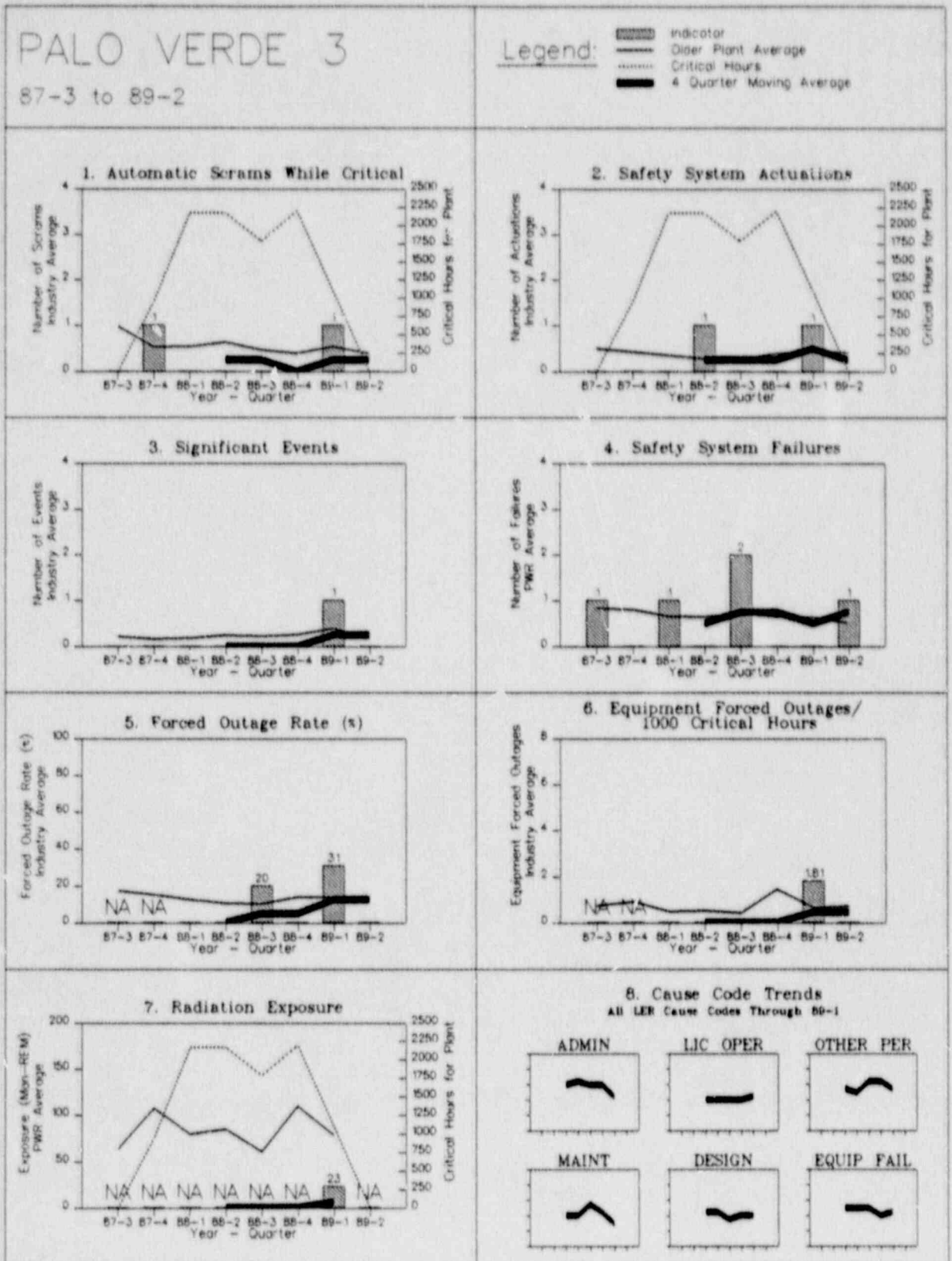


FIGURE 4.68

PALO VERDE 3

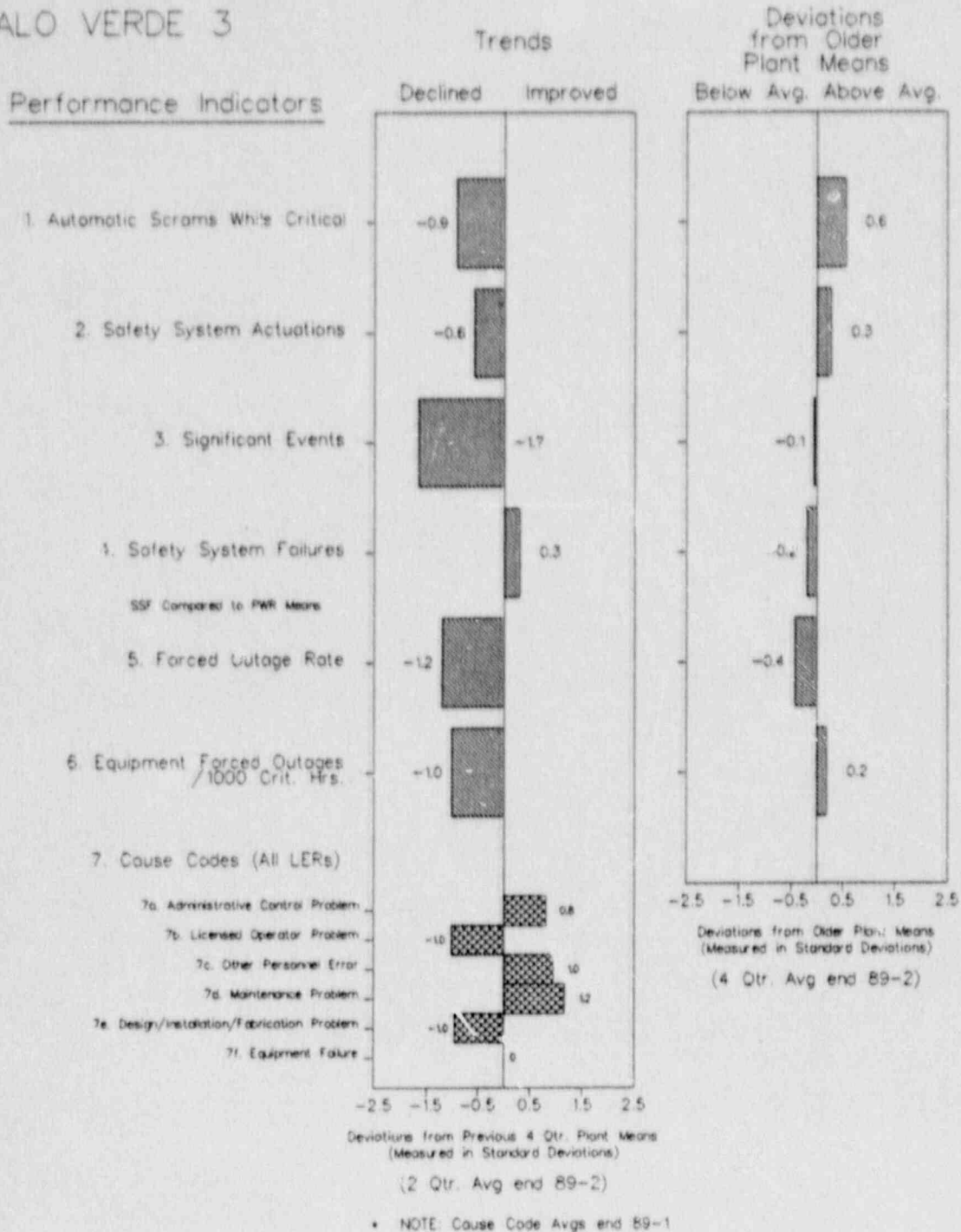


FIGURE 4.69

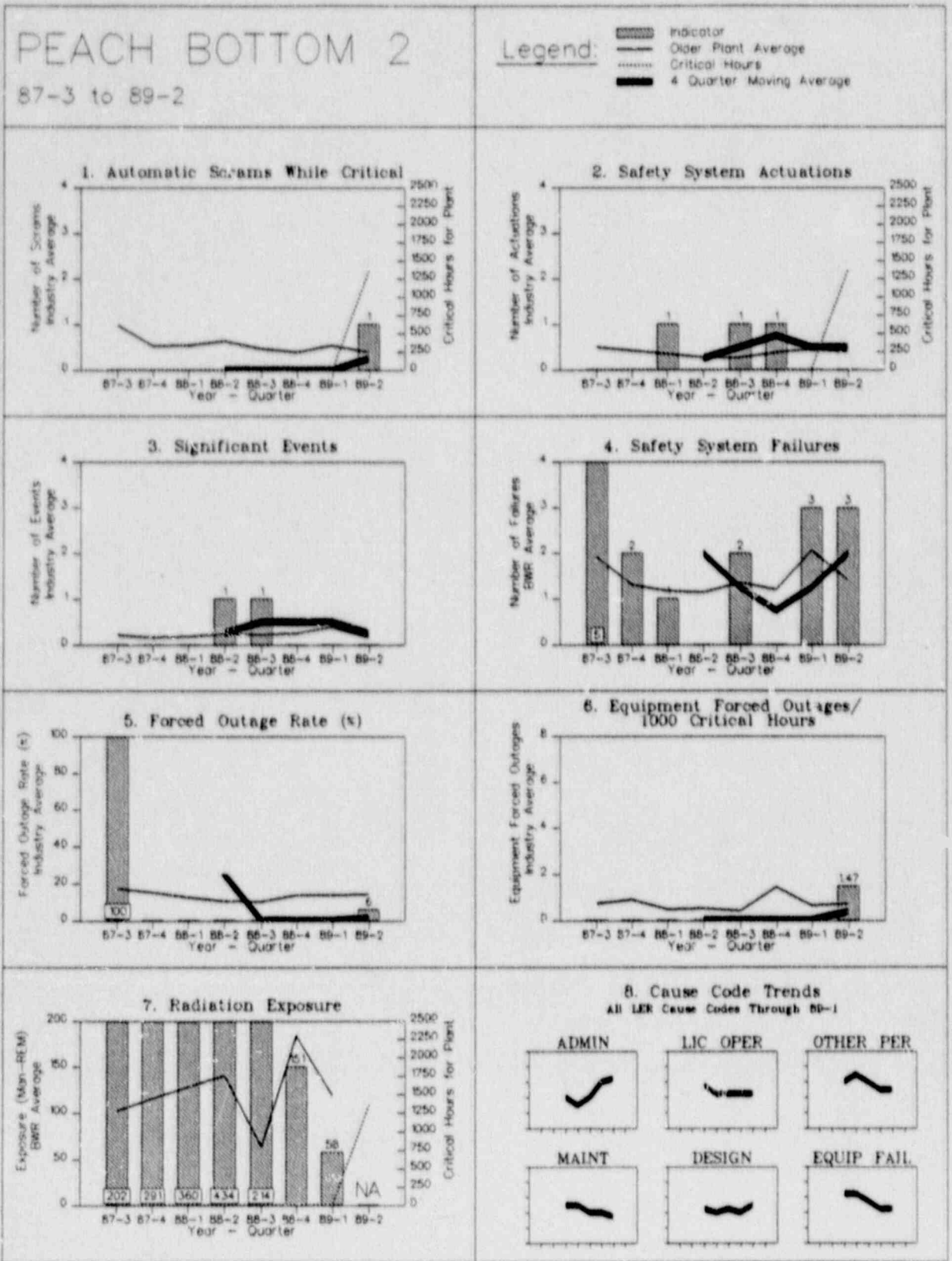


FIGURE 4.69

# PEACH BOTTOM 2

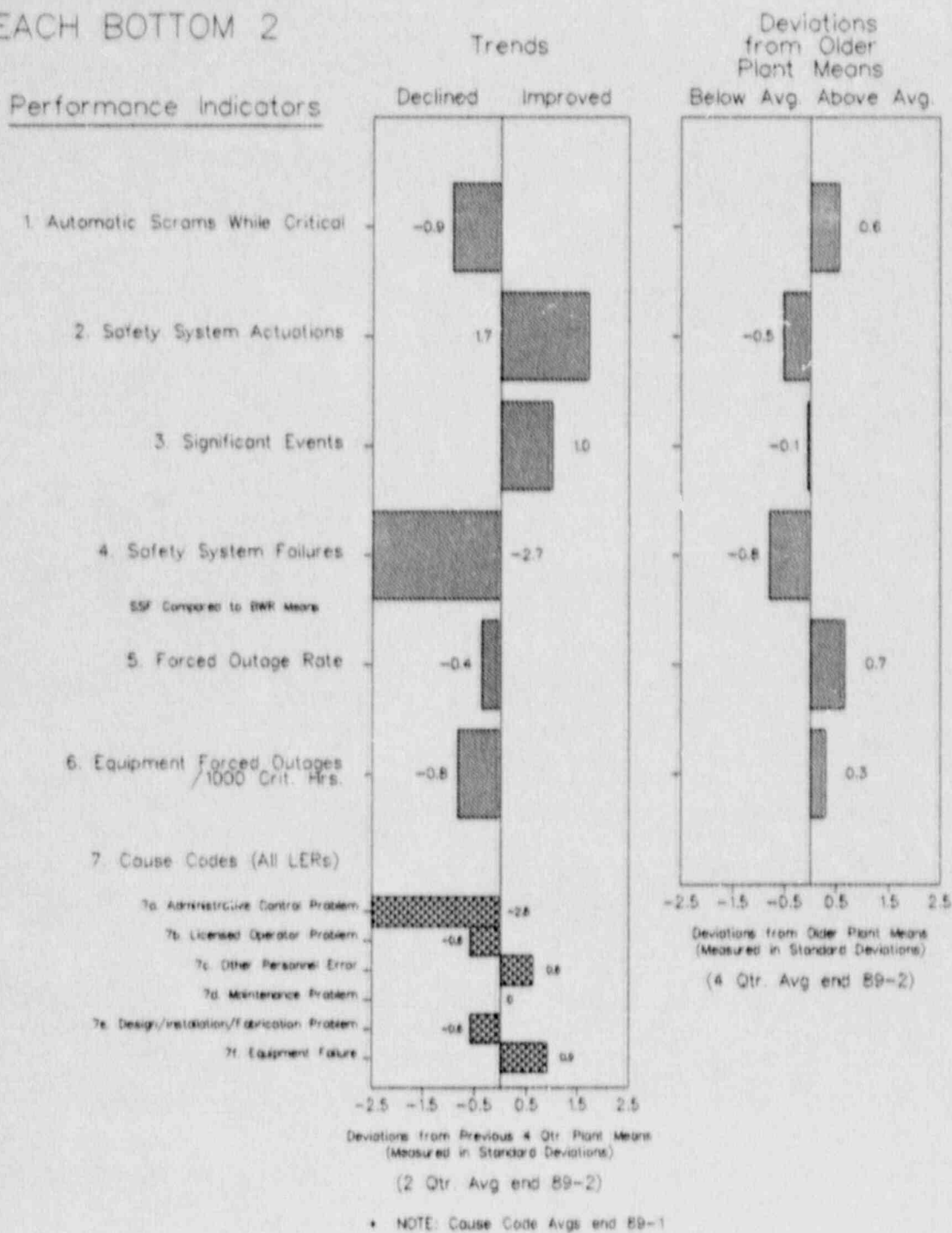


FIGURE 4.70

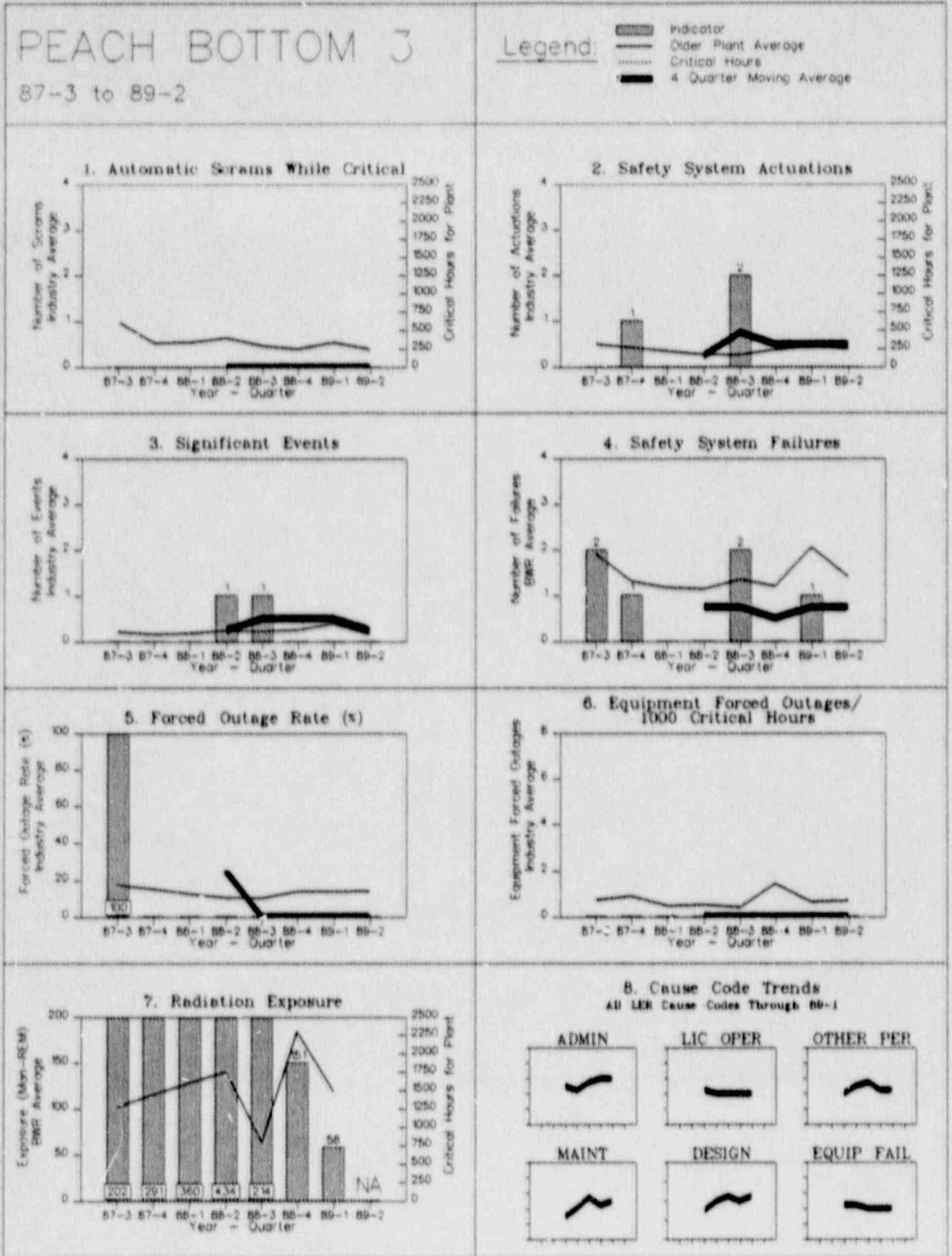
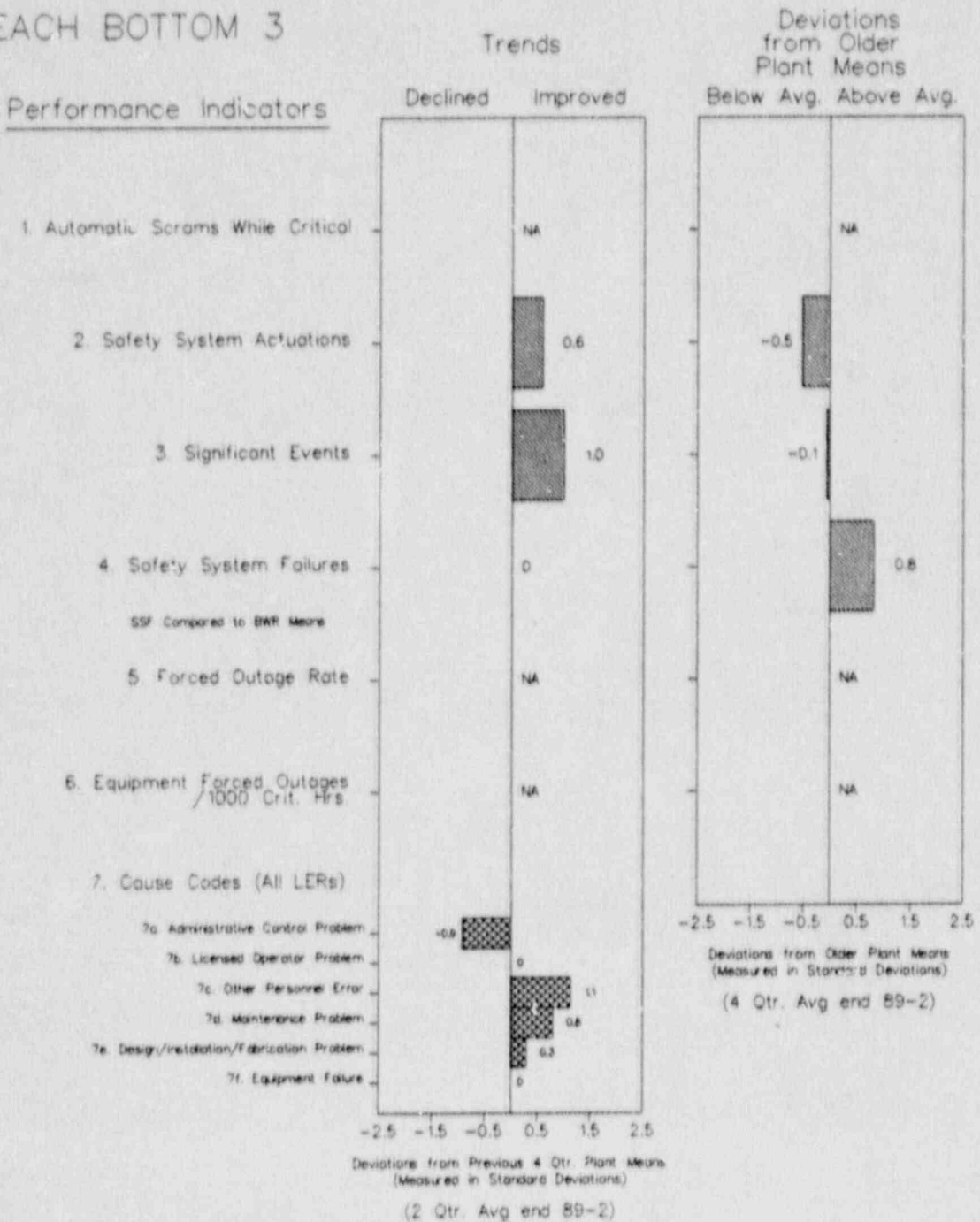




FIGURE 4.70

PEACH BOTTOM 3



\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.71

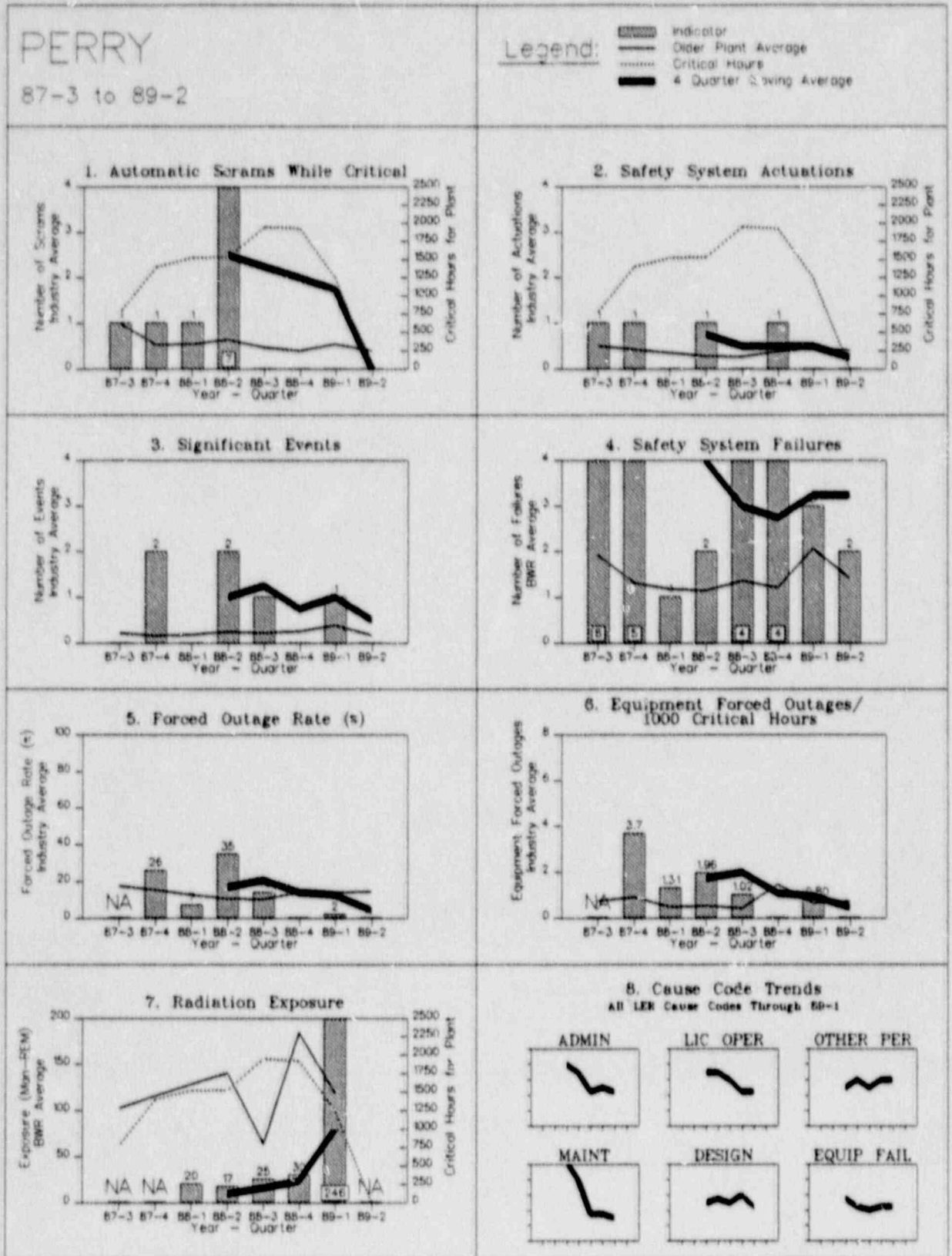


FIGURE 4.71

PERRY

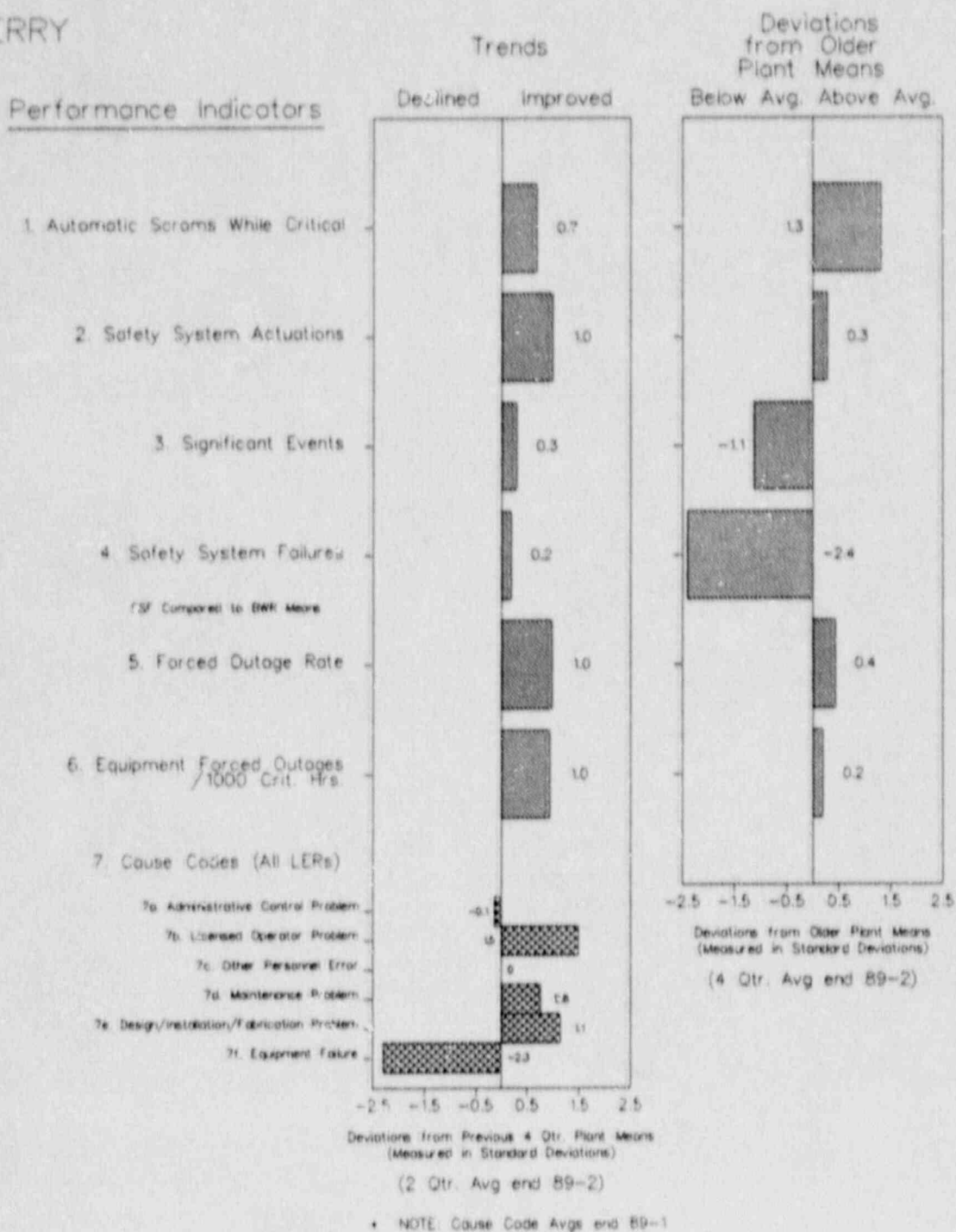


FIGURE 4.72

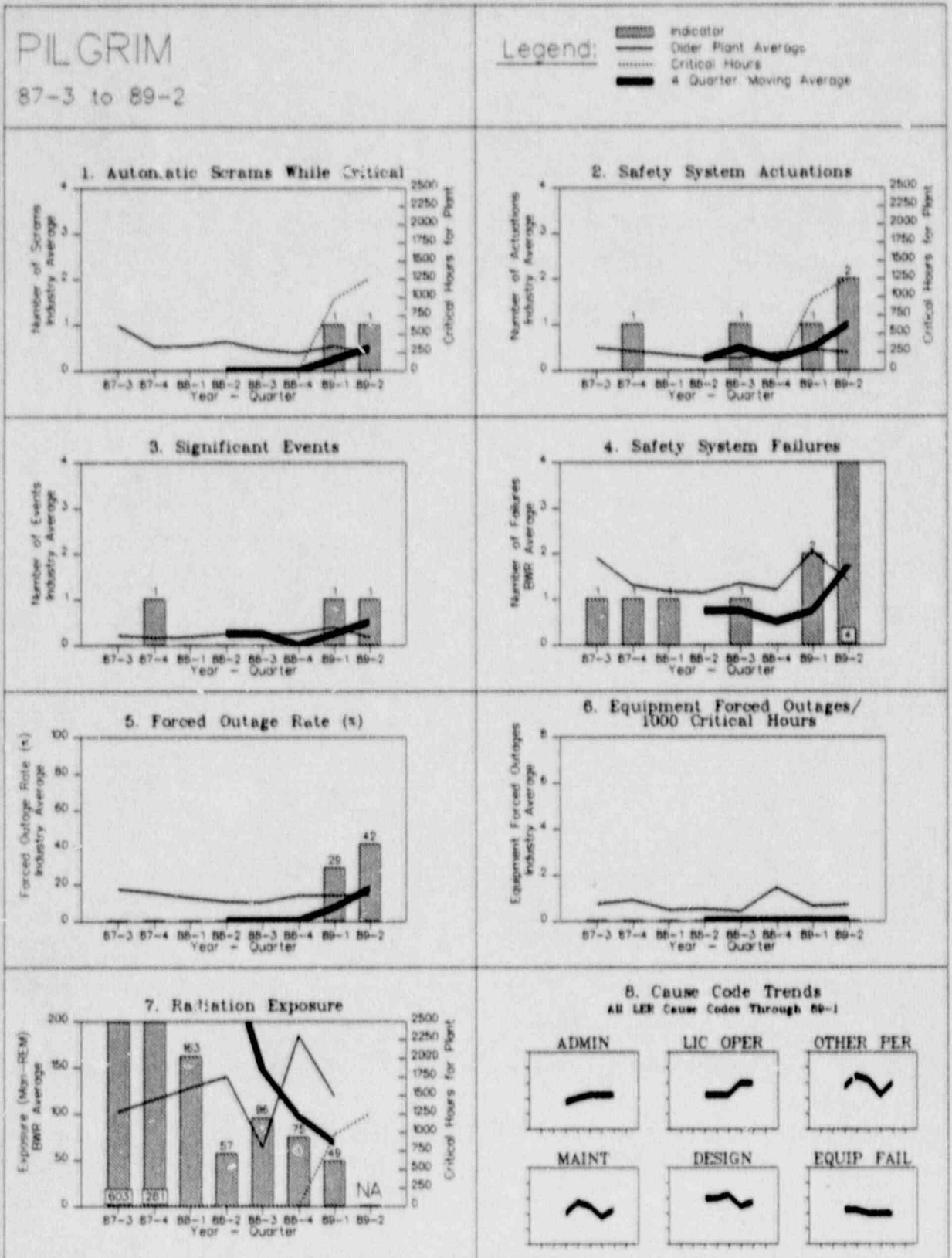


FIGURE 4.72

PILGRIM

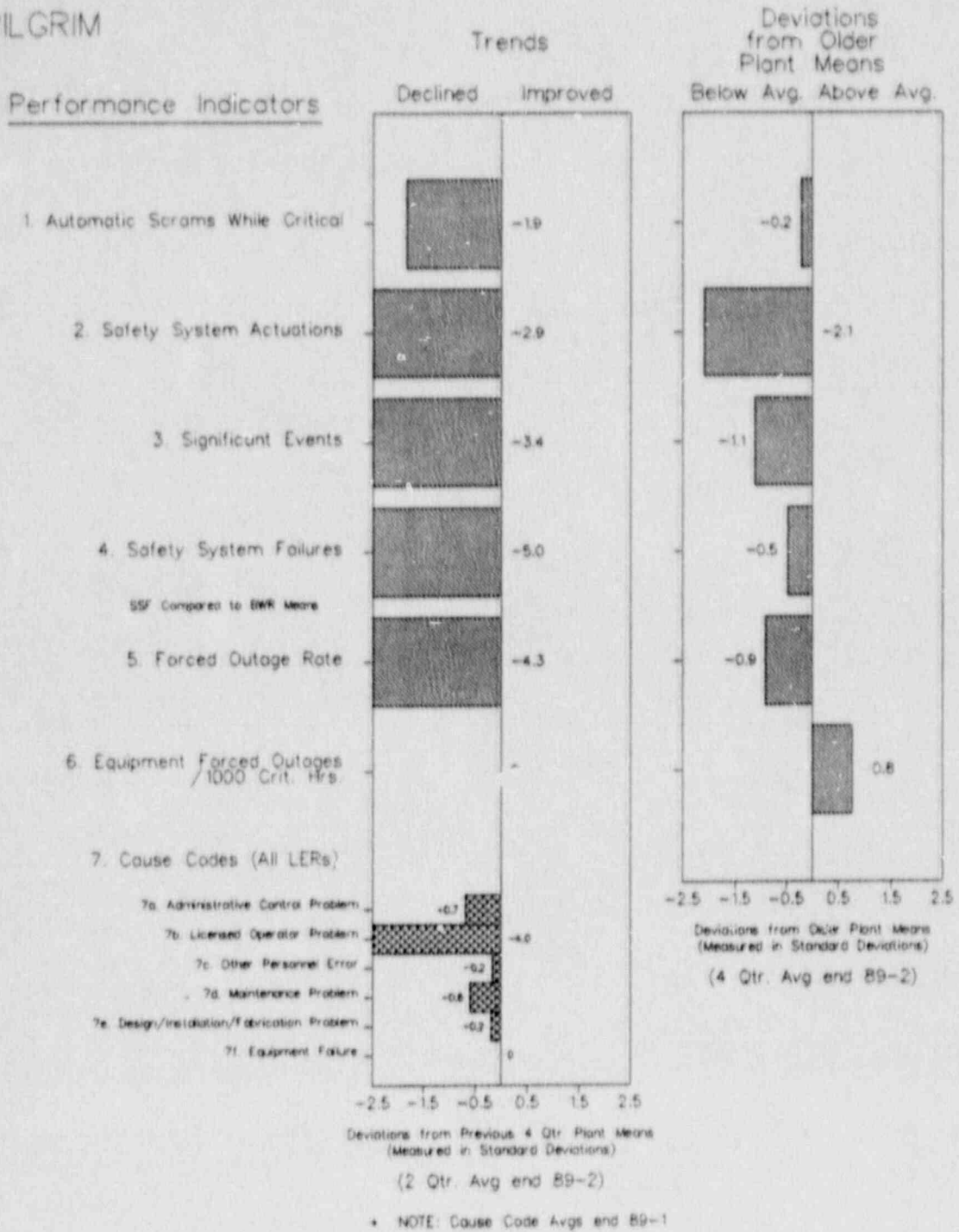


FIGURE 4.73

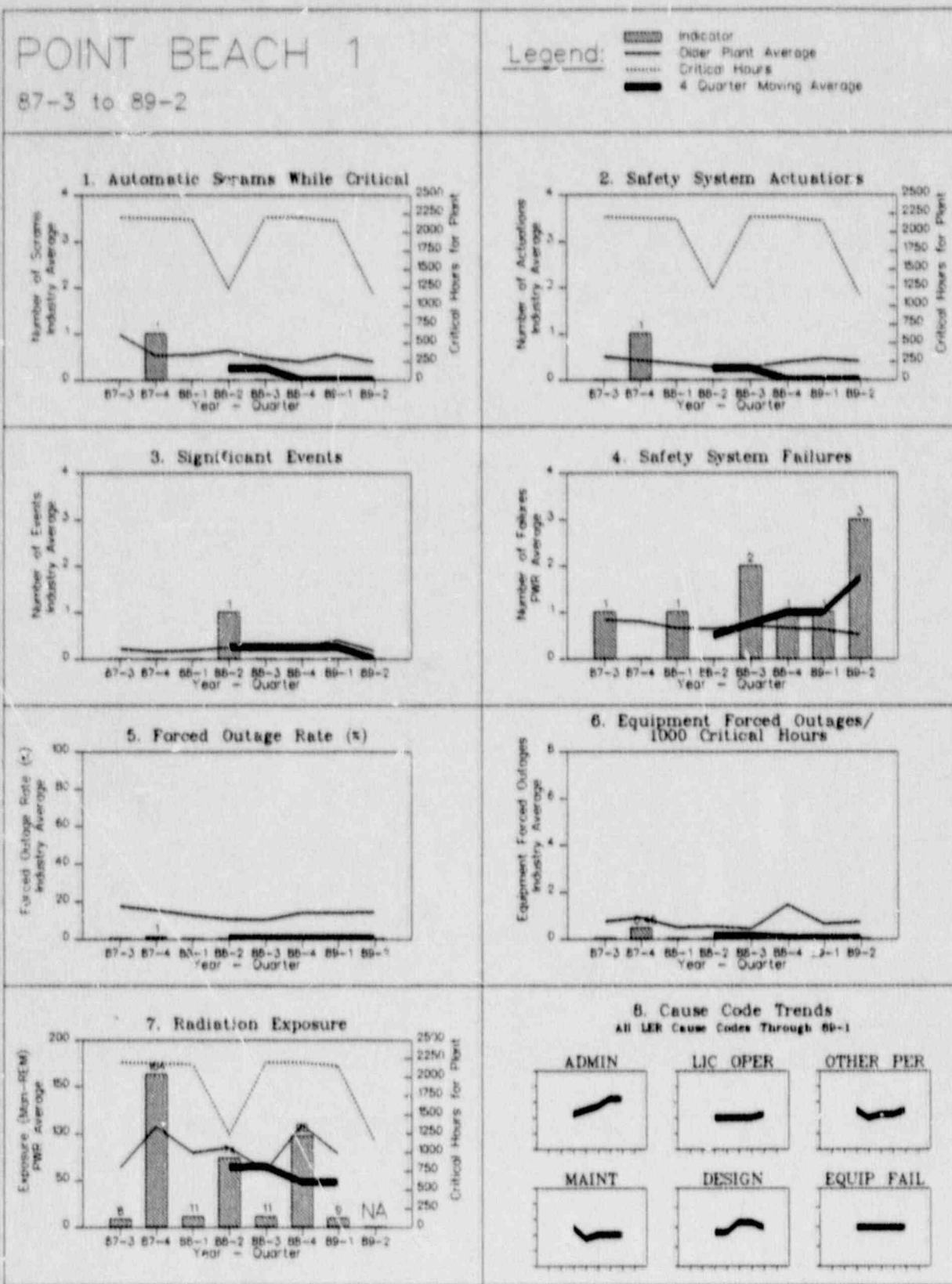


FIGURE 4.73

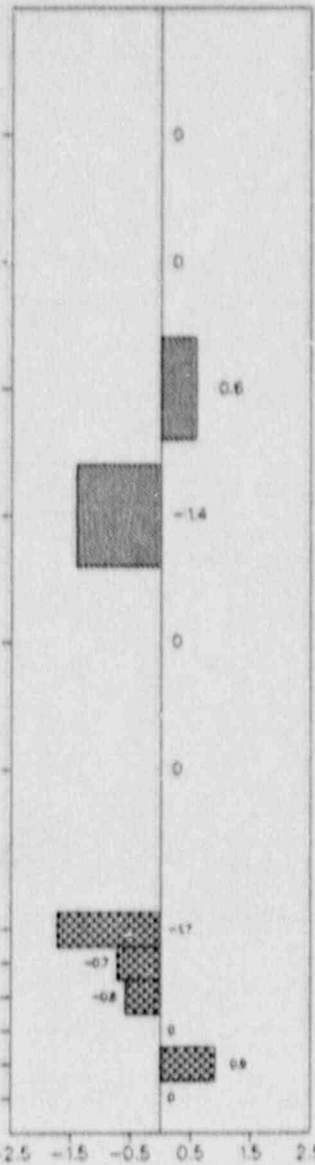
POINT BEACH 1

Performance Indicators

- 1. Automatic Scrums While Critical
- 2. Safety System Actuations
- 3. Significant Events
- 4. Safety System Failures
- SSF Compared to PWR Means
- 5. Forced Outage Rate
- 6. Equipment Forced Outages / 1000 Crit. Hrs.
- 7. Cause Codes (All LERs)
  - 7a. Administrative Control Problem
  - 7b. Licensed Operator Problem
  - 7c. Other Personnel Error
  - 7d. Maintenance Problem
  - 7e. Design/Installation/Fabrication Problem
  - 7f. Equipment Failure

Trends

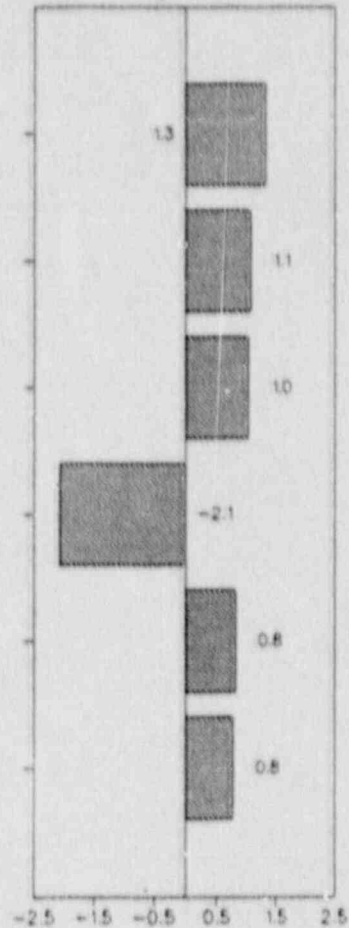
Declined Improved



Deviations from Previous 4 Qtr. Plant Means  
(Measured in Standard Deviations)  
(2 Qtr. Avg end 89-2)

Deviations from Older Plant Means

Below Avg. Above Avg.



Deviations from Older Plant Means  
(Measured in Standard Deviations)  
(4 Qtr. Avg end 89-2)

• NOTE: Cause Code Avgs end 89-1

FIGURE 4.74

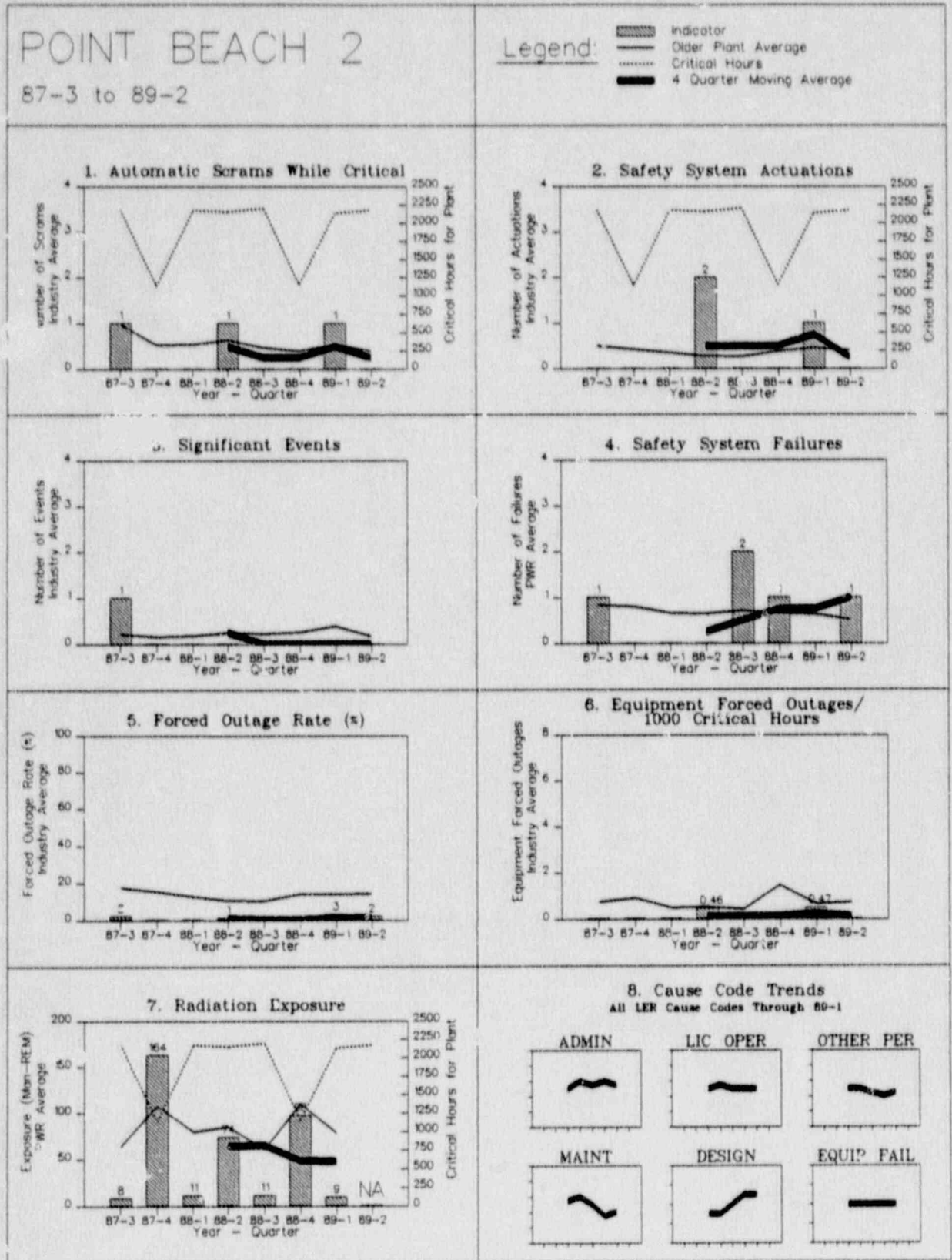




FIGURE 4.74

POINT BEACH 2

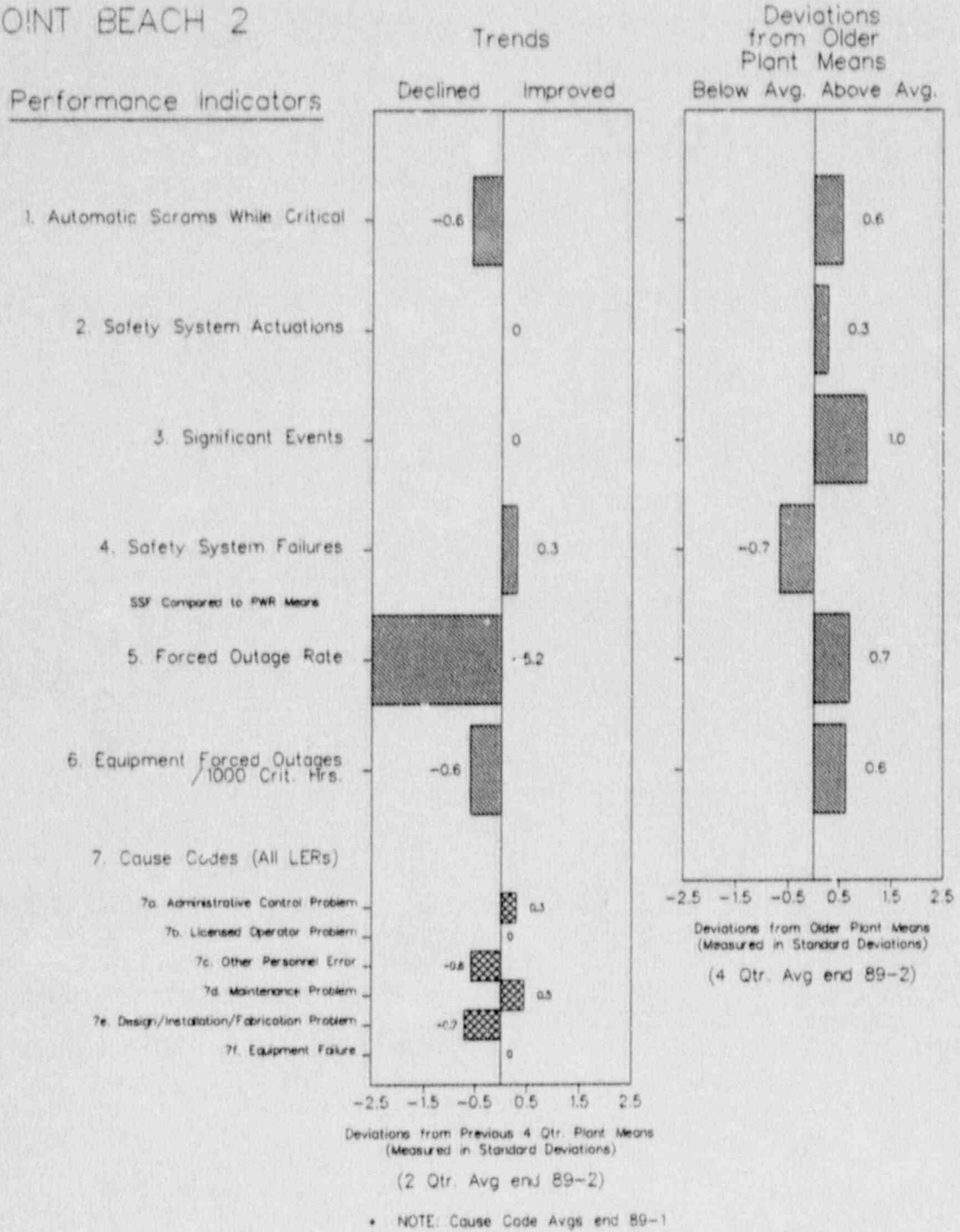


FIGURE 4.75

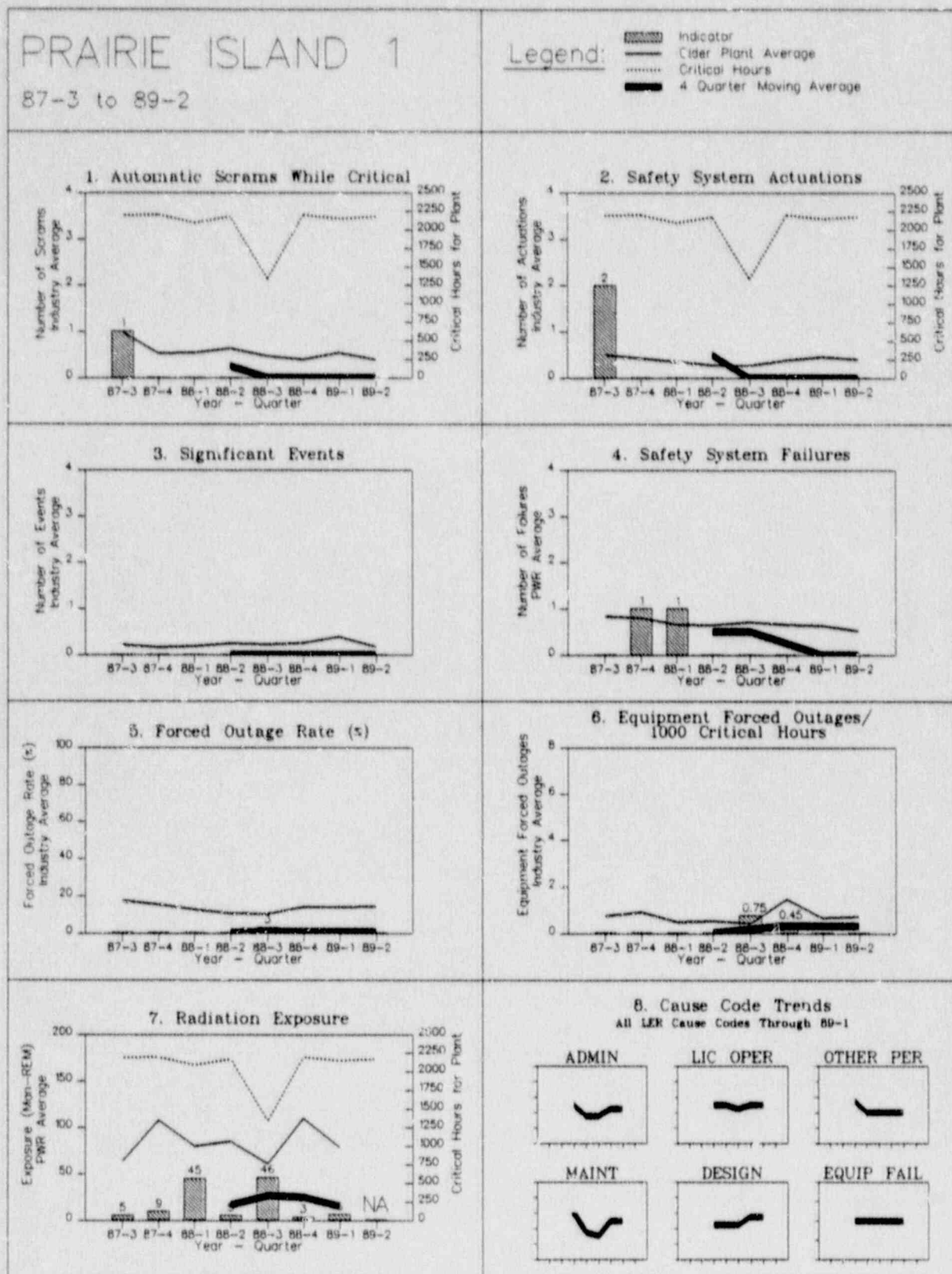


FIGURE 4.75

PPAIRIE ISLAND 1

Performance Indicators

Trends

Declined Improved

Deviations from Older Plant Means

Below Avg. Above Avg.

1. Automatic Scrams While Critical

0

1.3

2. Safety System Actuations

0

1.1

3. Significant Events

0

1.0

4. Safety System Failures

0.6

1.2

SSF Compared to PWR Means

5. Forced Outage Rate

0.6

0.8

6. Equipment Forced Outages /1000 Crit. Hrs.

0.9

0.4

7. Cause Codes (All LERs)

7a. Administrative Control Problem

-2.9

7b. Licensed Operator Problem

-0.6

7c. Other Personnel Error

0

7d. Maintenance Problem

-1.7

7e. Design/Installation/Fabrication Problem

-1.7

7f. Equipment Failure

0

-2.5 -1.5 -0.5 0.5 1.5 2.5

Deviations from Previous 4 Qtr. Plant Means (Measured in Standard Deviations)

(2 Qtr. Avg end 89-2)

-2.5 -1.5 -0.5 0.5 1.5 2.5

Deviations from Older Plant Means (Measured in Standard Deviations)

(4 Qtr. Avg end 89-2)

\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.76

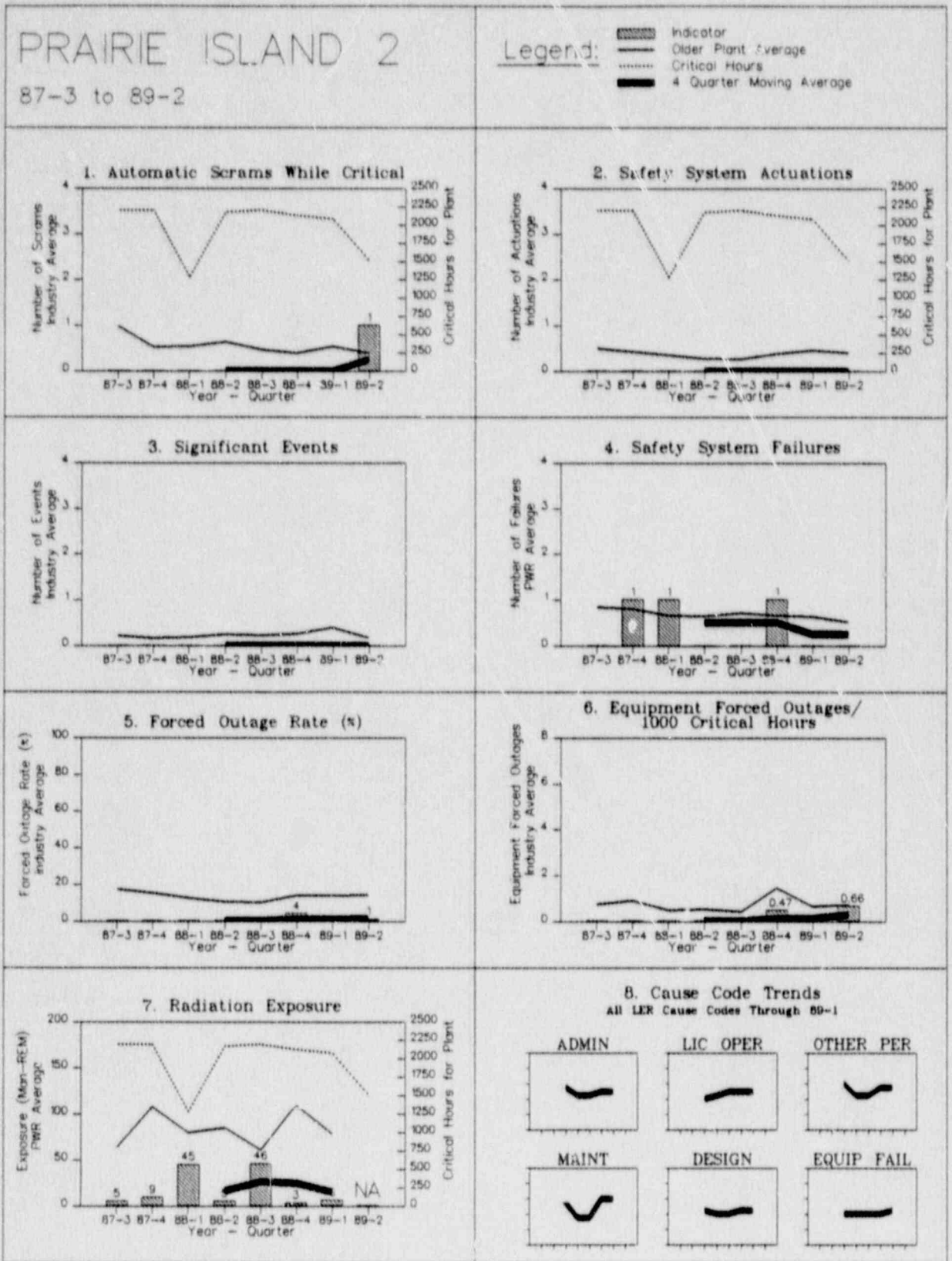
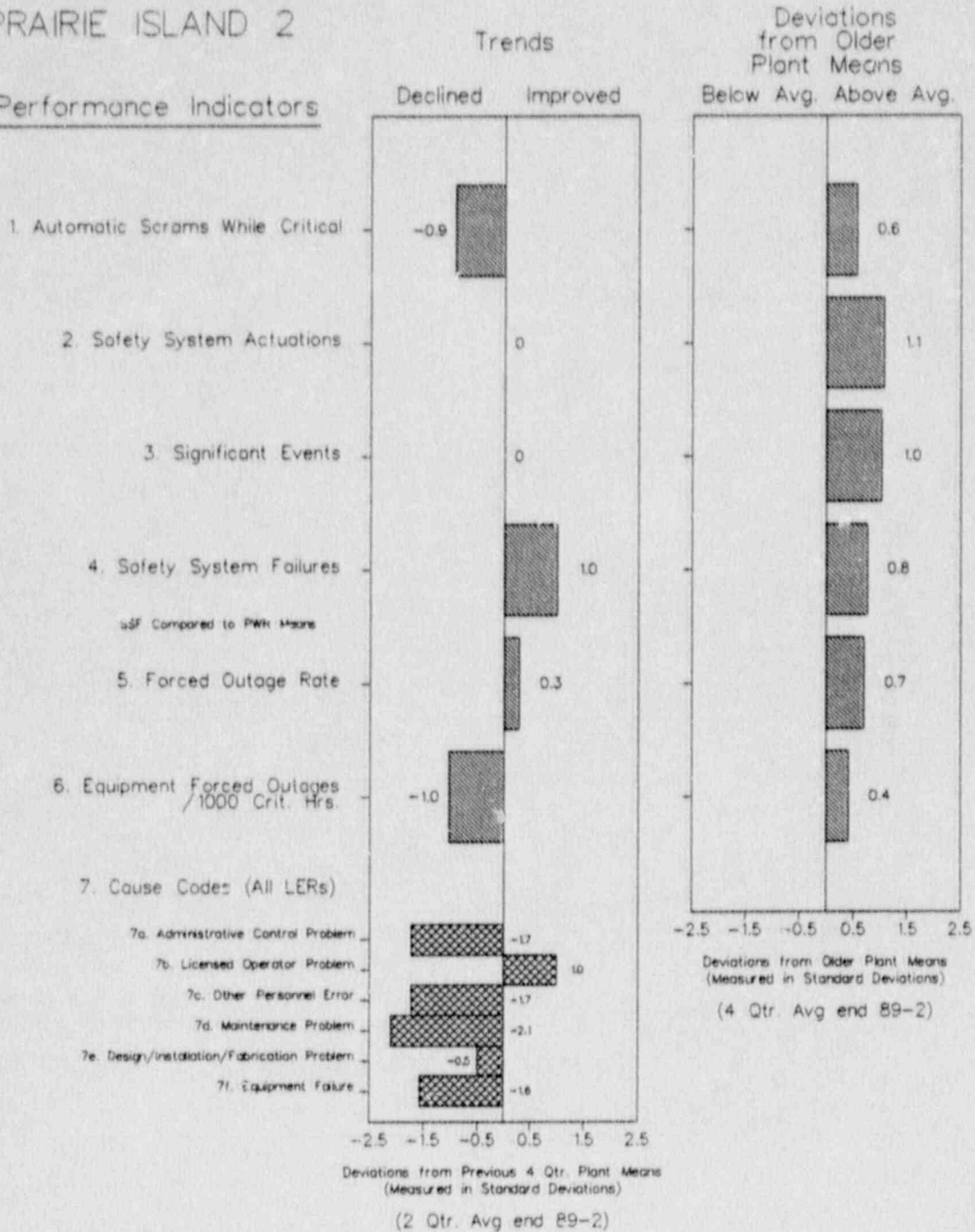


FIGURE 4.76

PRAIRIE ISLAND 2

Performance Indicators



\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.77

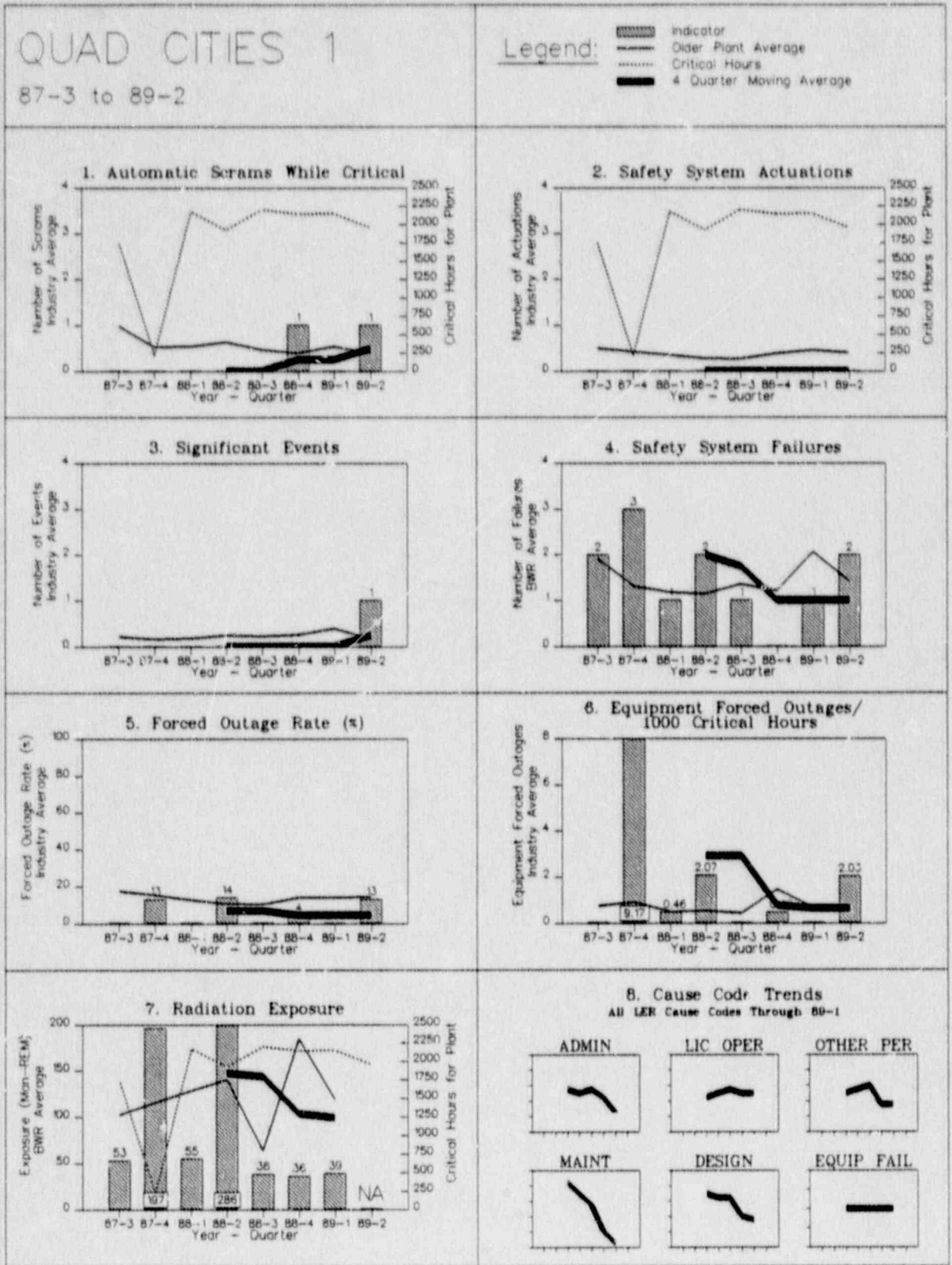
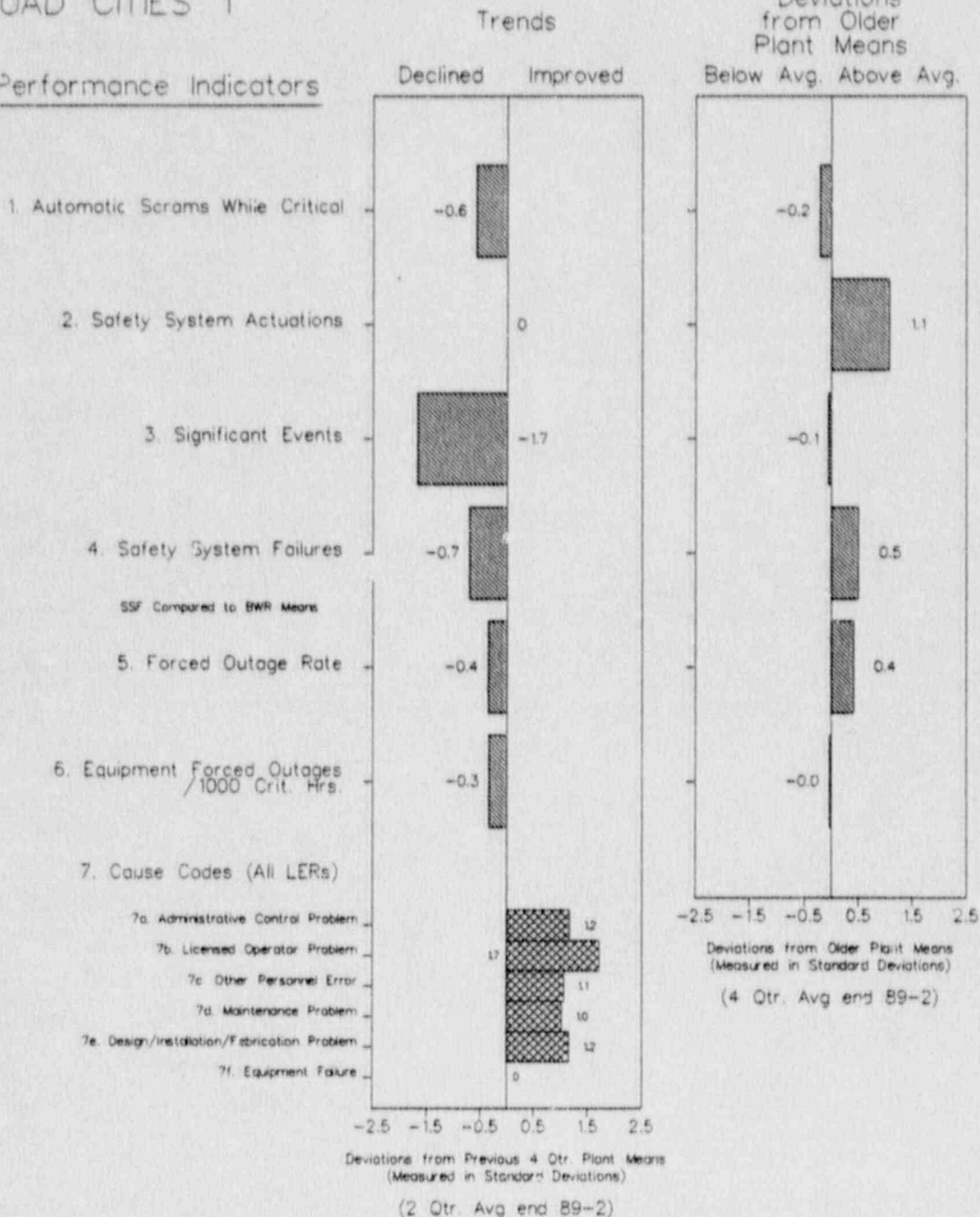


FIGURE 4.77

QUAD CITIES 1

Performance Indicators







\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.78

# QUAD CITIES 2

87-3 to 89-2

- Legend:**
-  Indicator
  -  Older Plant Average
  -  Critical Hours
  -  4 Quarter Moving Average

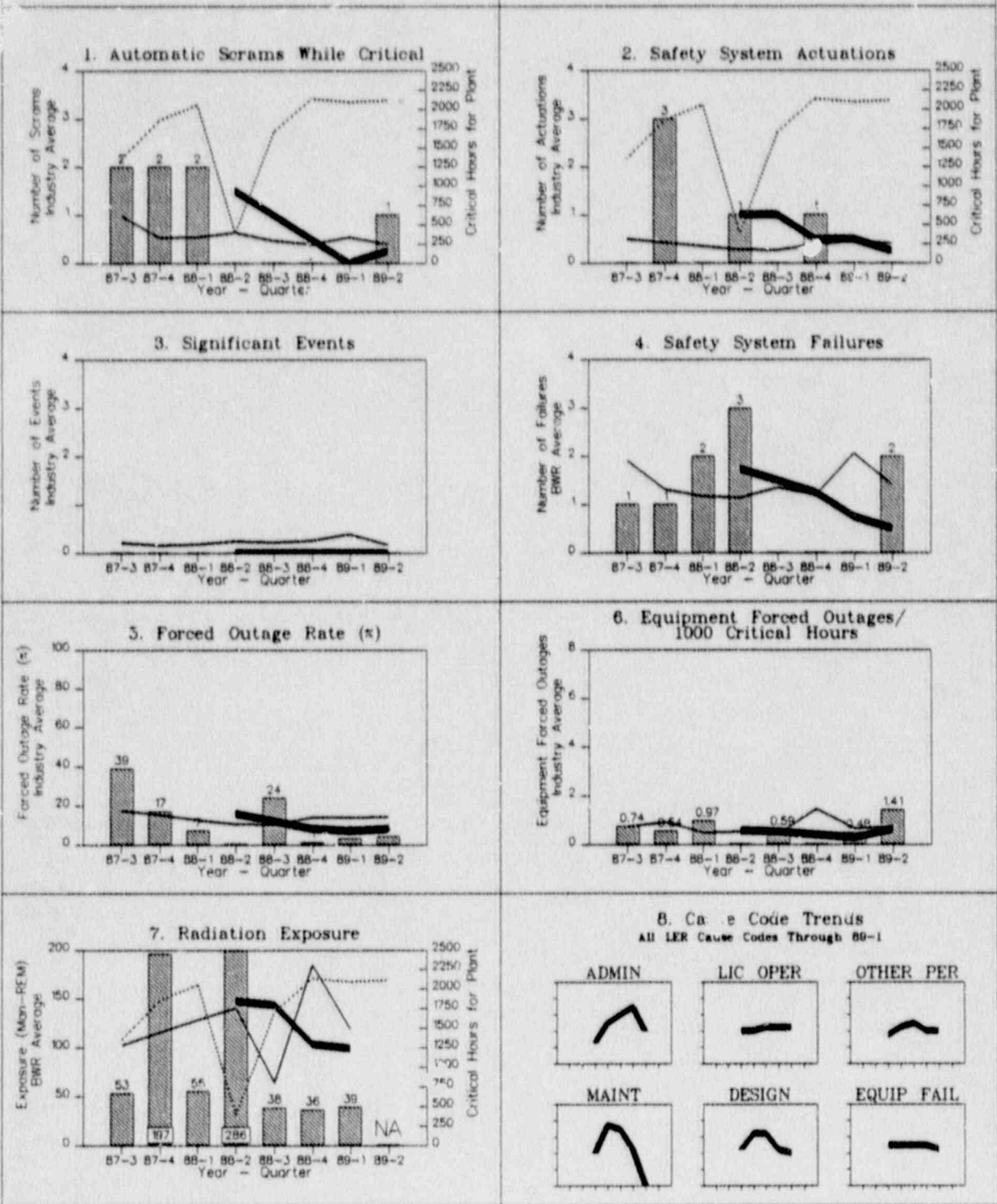




FIGURE 4.78

QJAD CITIES 2

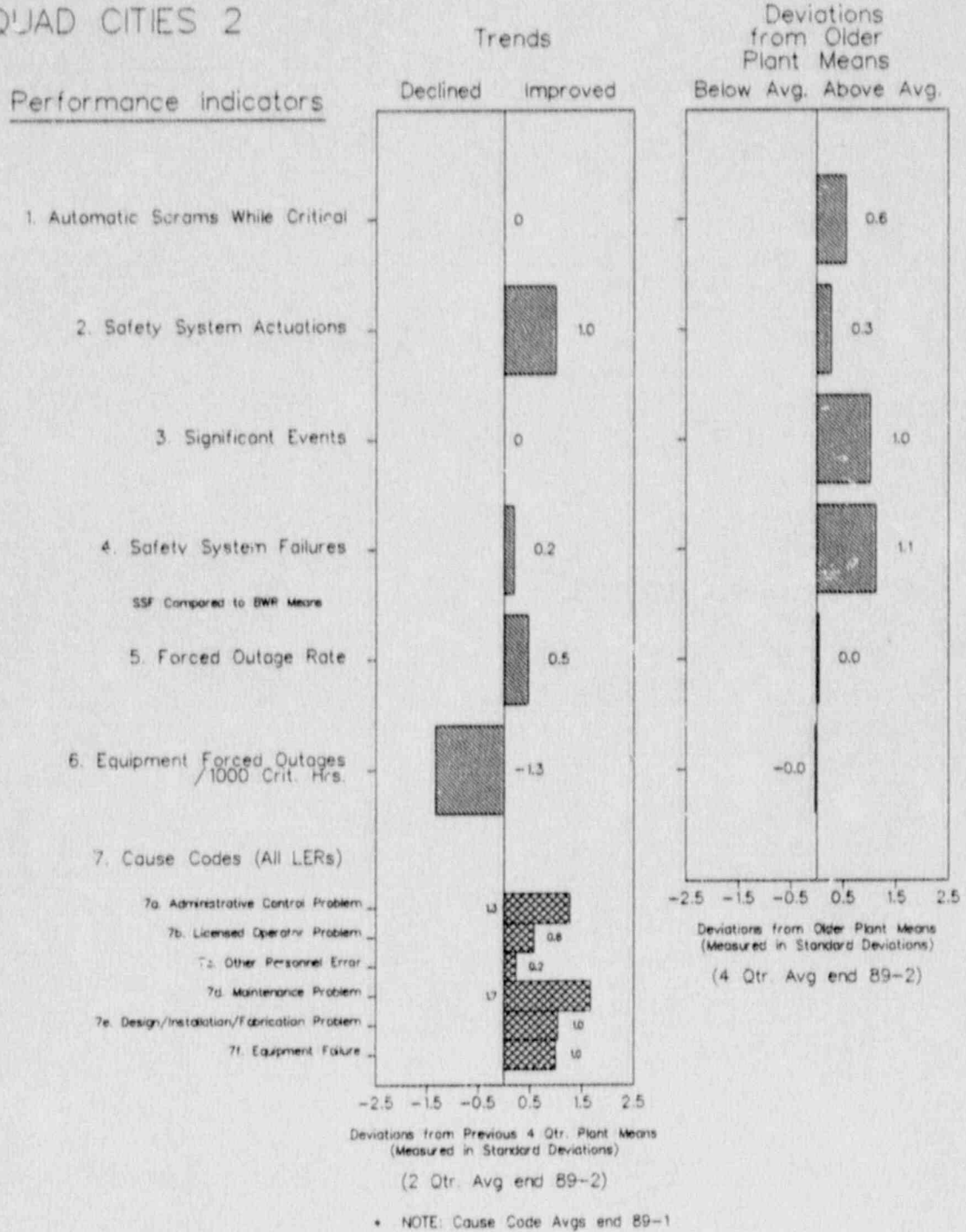


FIGURE 4.79

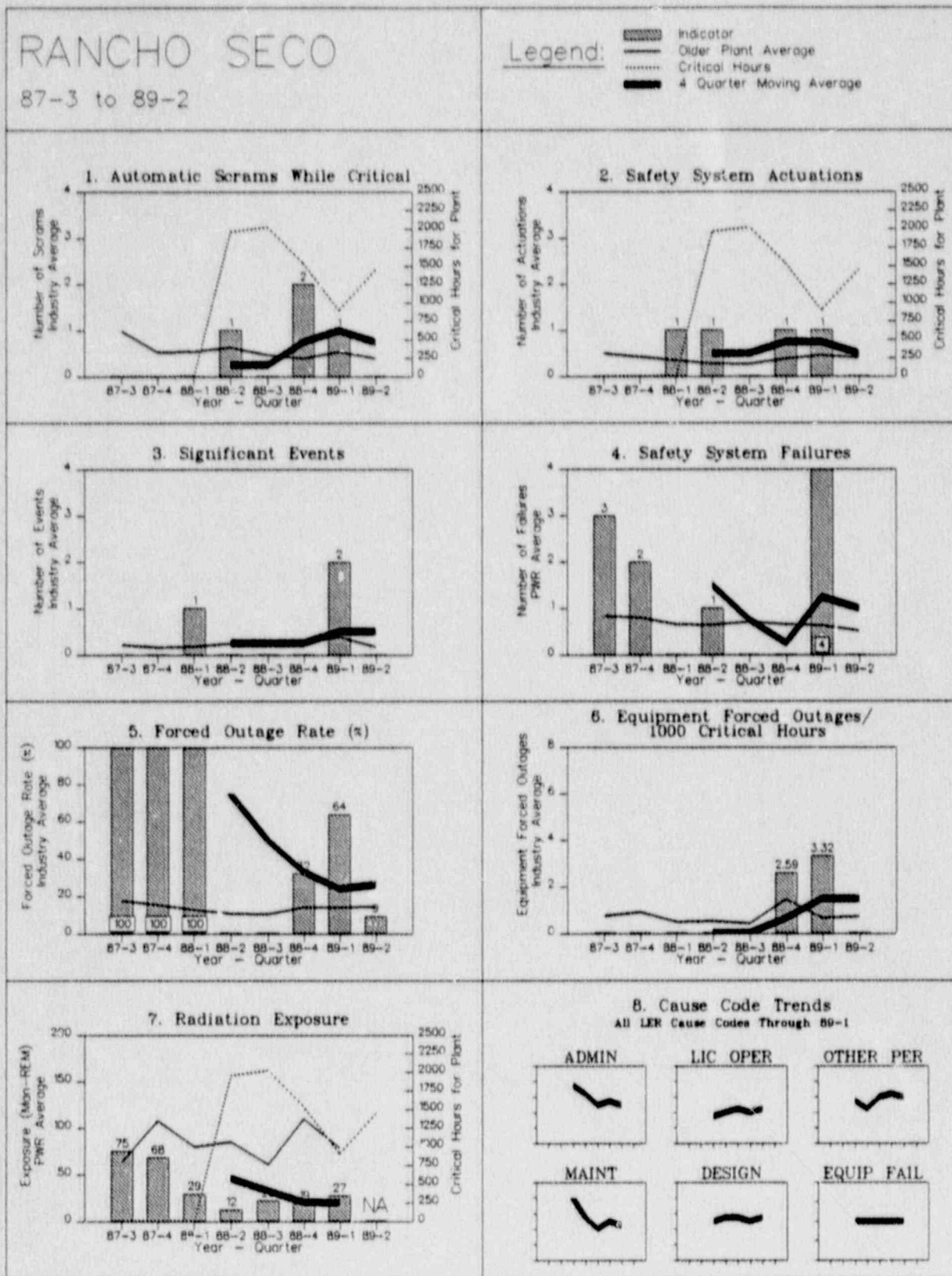
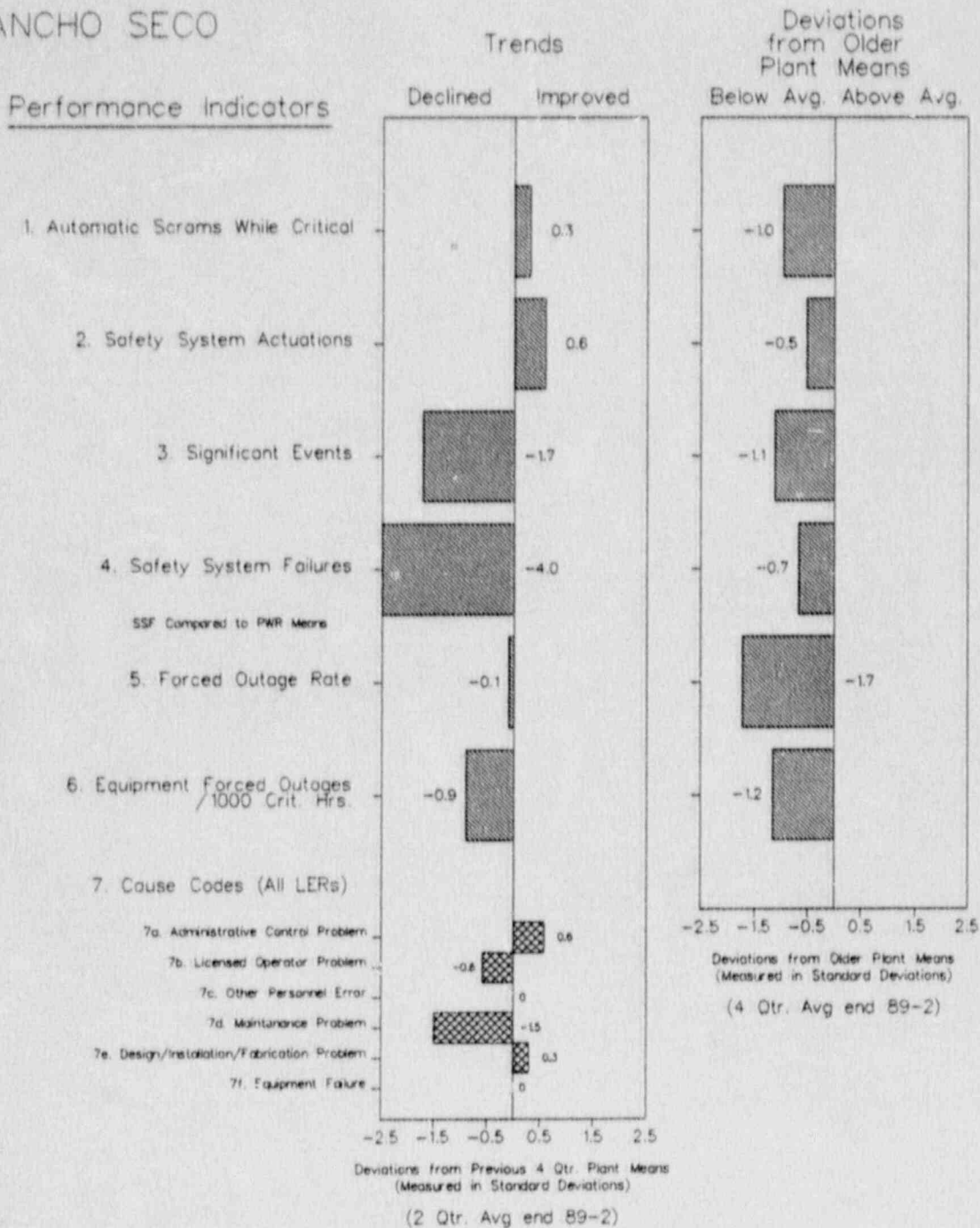


FIGURE 4.79

RANCHO SECO



\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.80

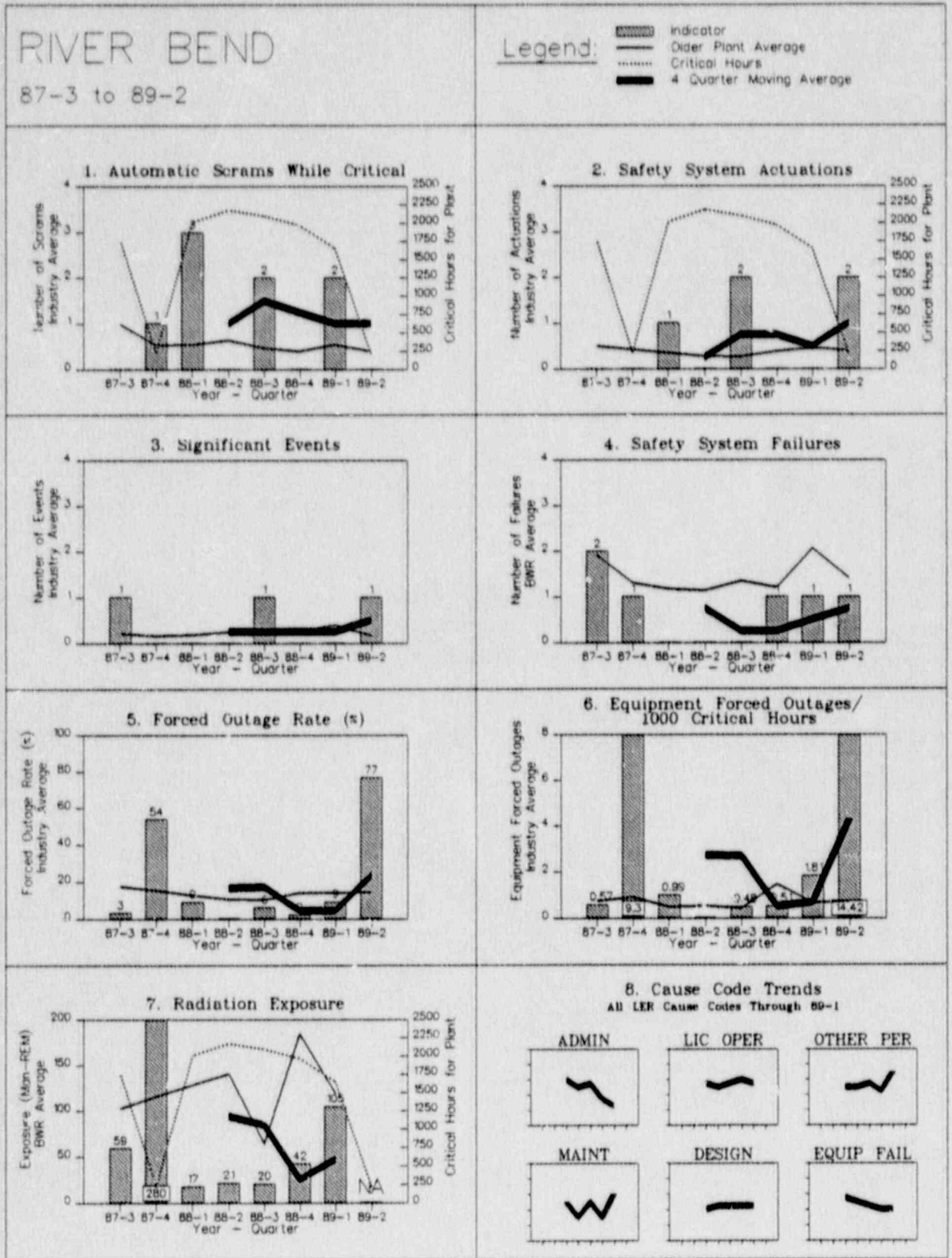


FIGURE 4.80

RIVER BEND

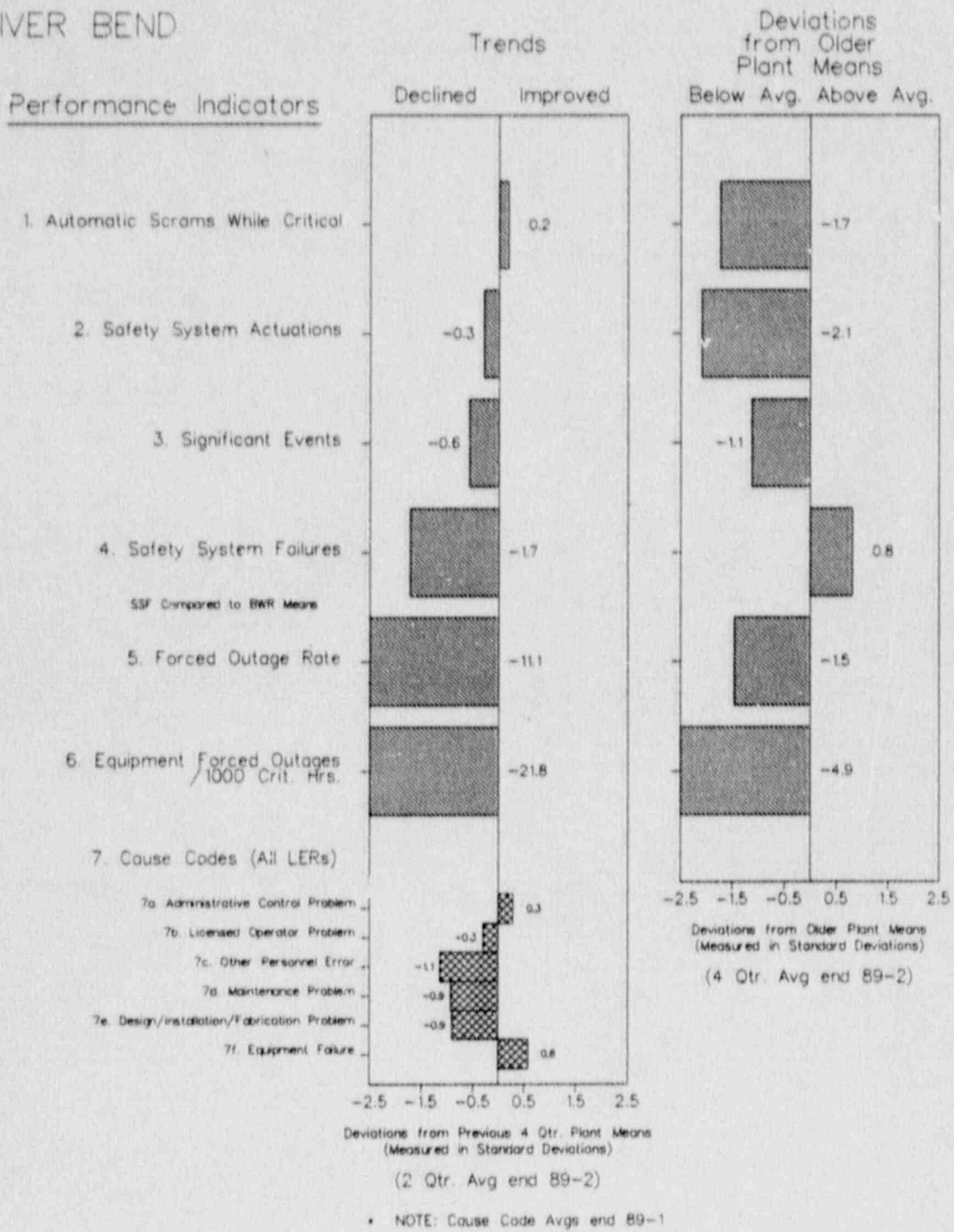


FIGURE 4.81

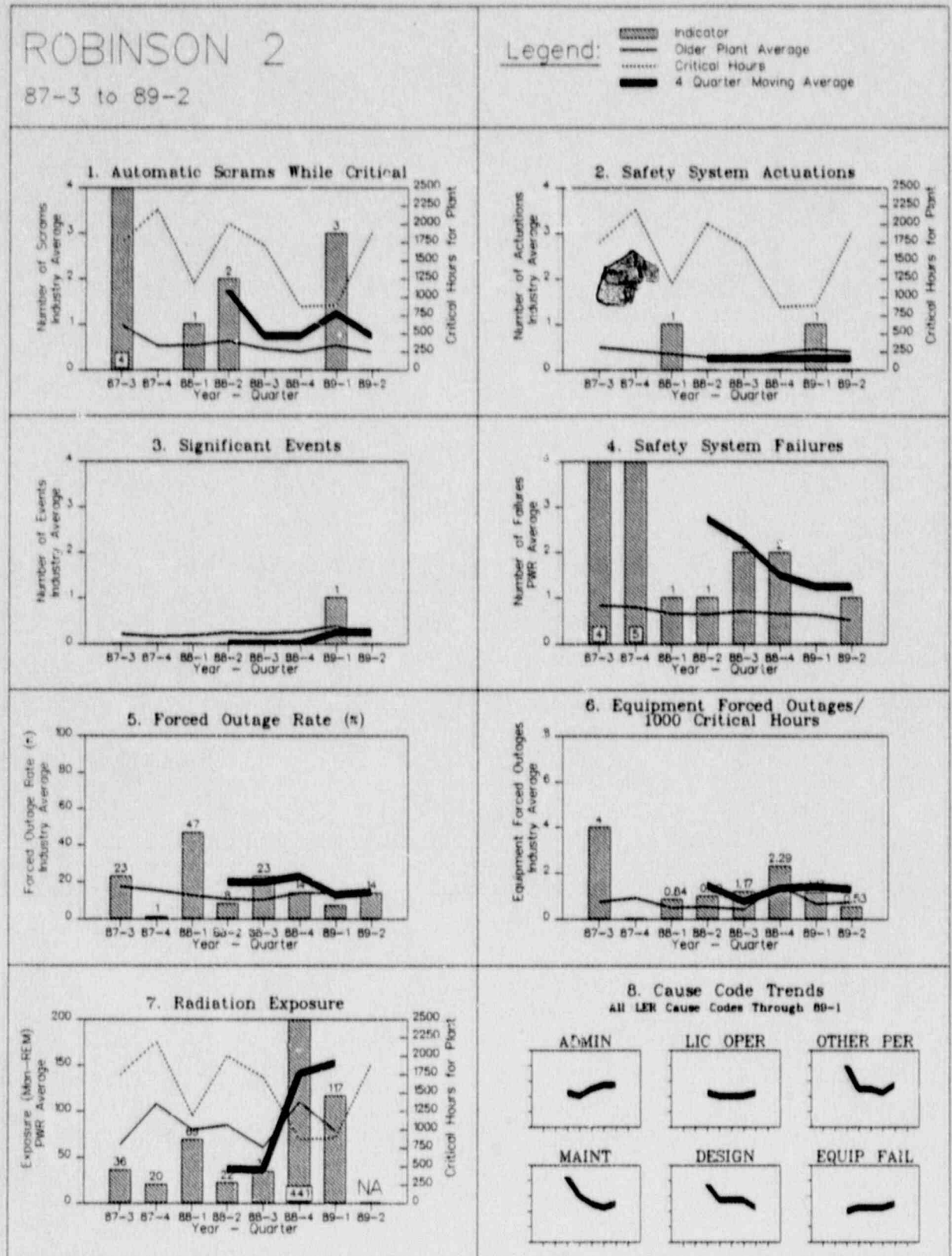


FIGURE 4.81

ROBINSON 2

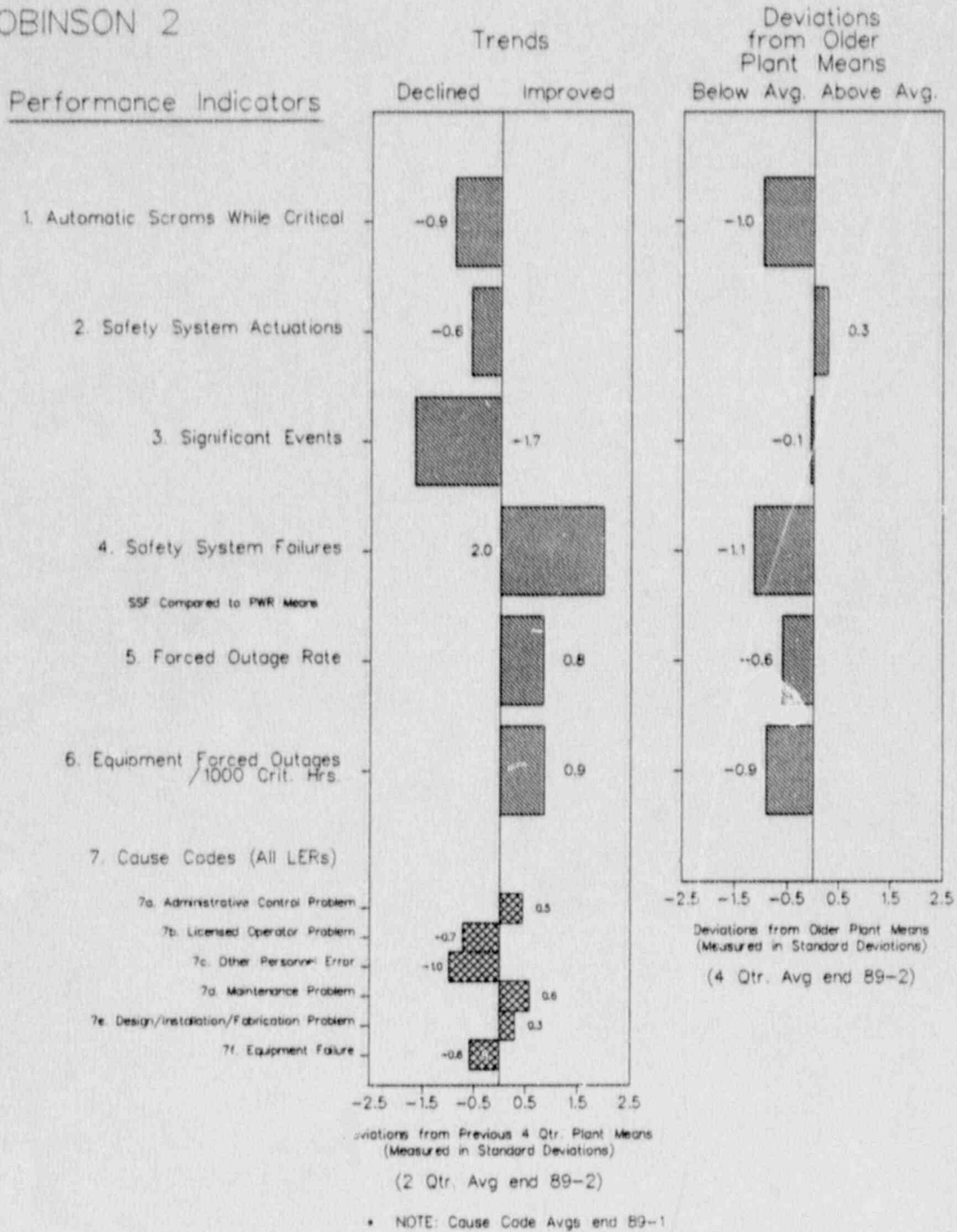


FIGURE 4.82

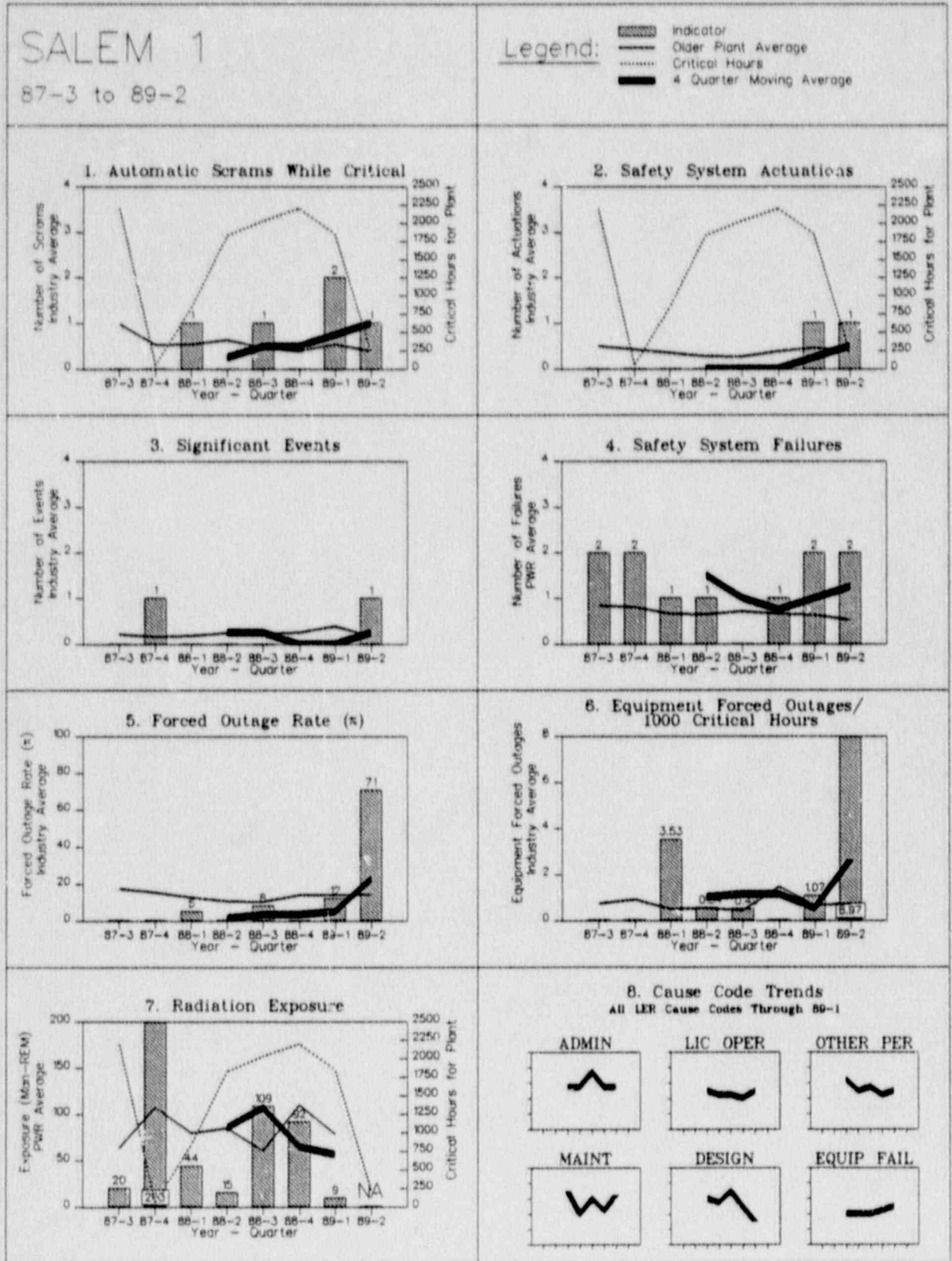




FIGURE 4.82

SALEM 1

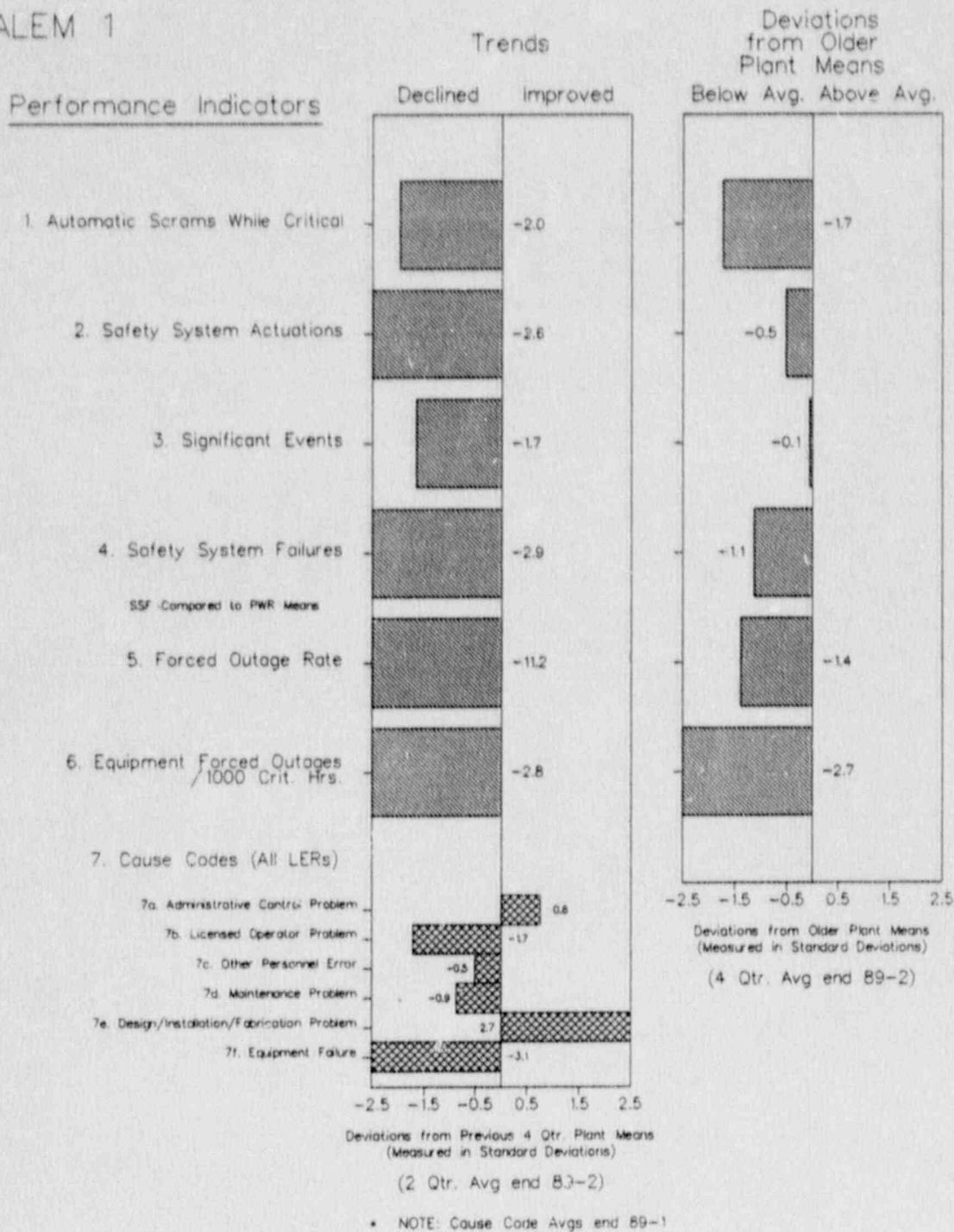


FIGURE 4.83

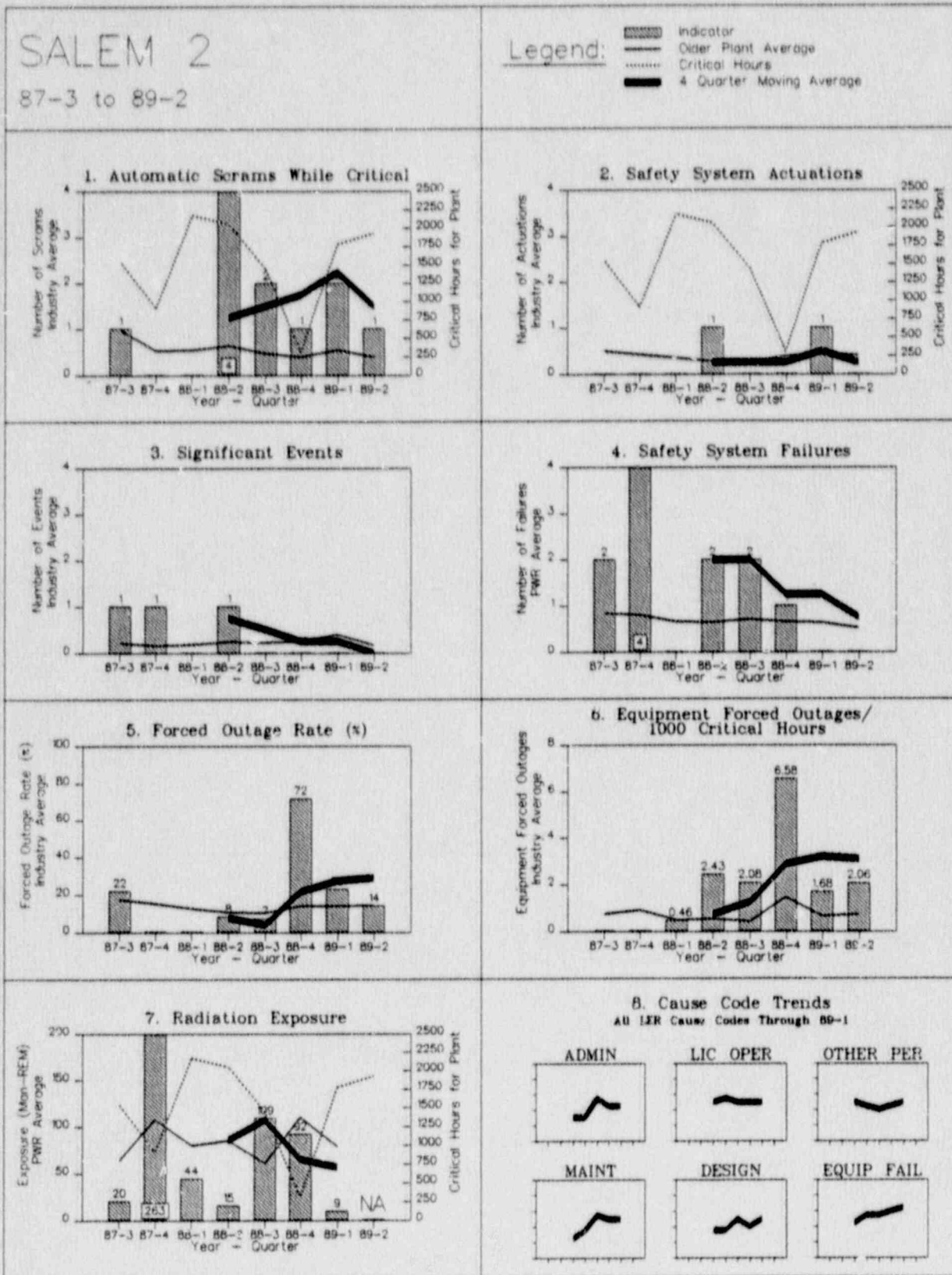


FIGURE 4.83

SALEM 2

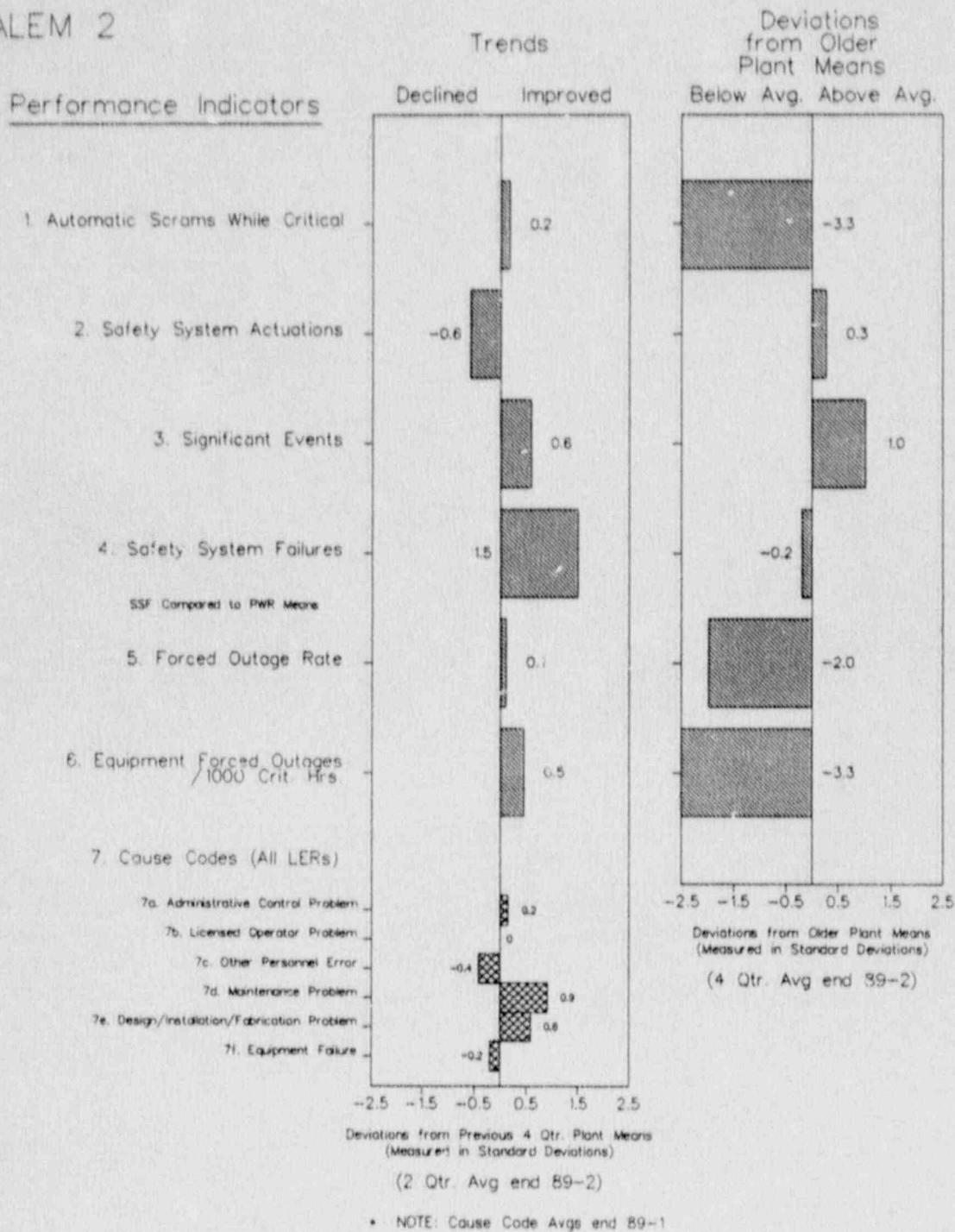


FIGURE 4.84

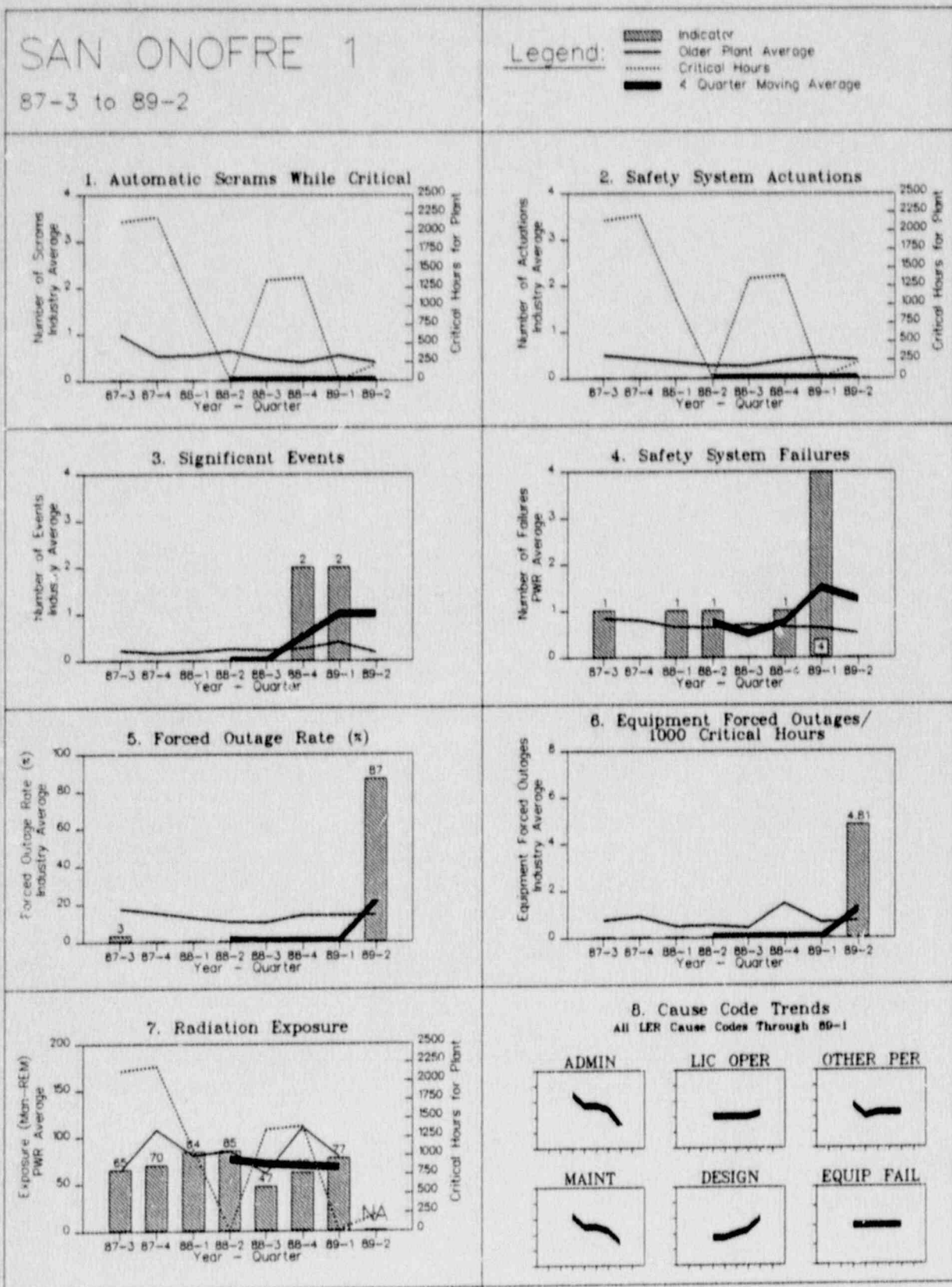


FIGURE 4.84

SAN ONOFRE 1

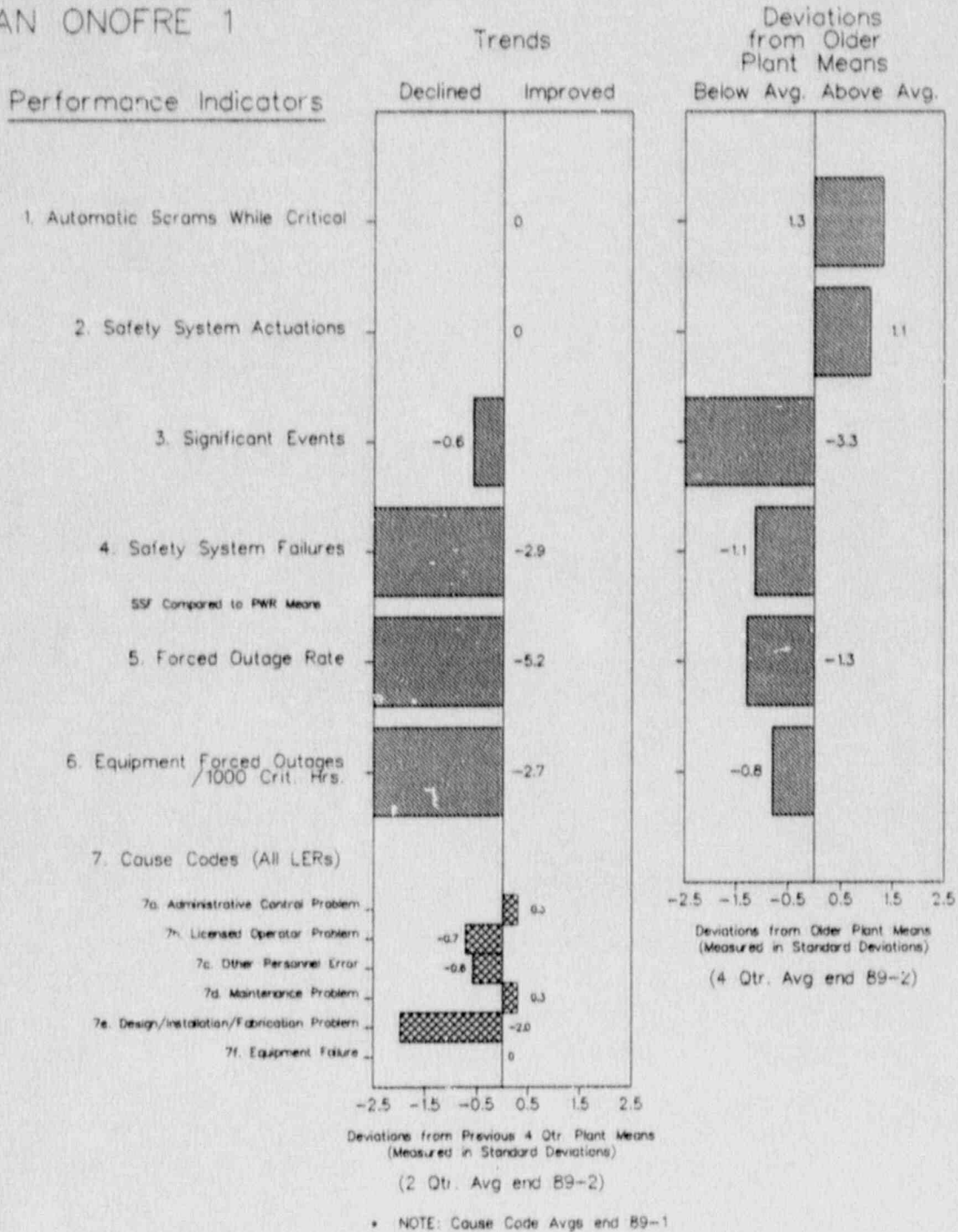


FIGURE 4.85

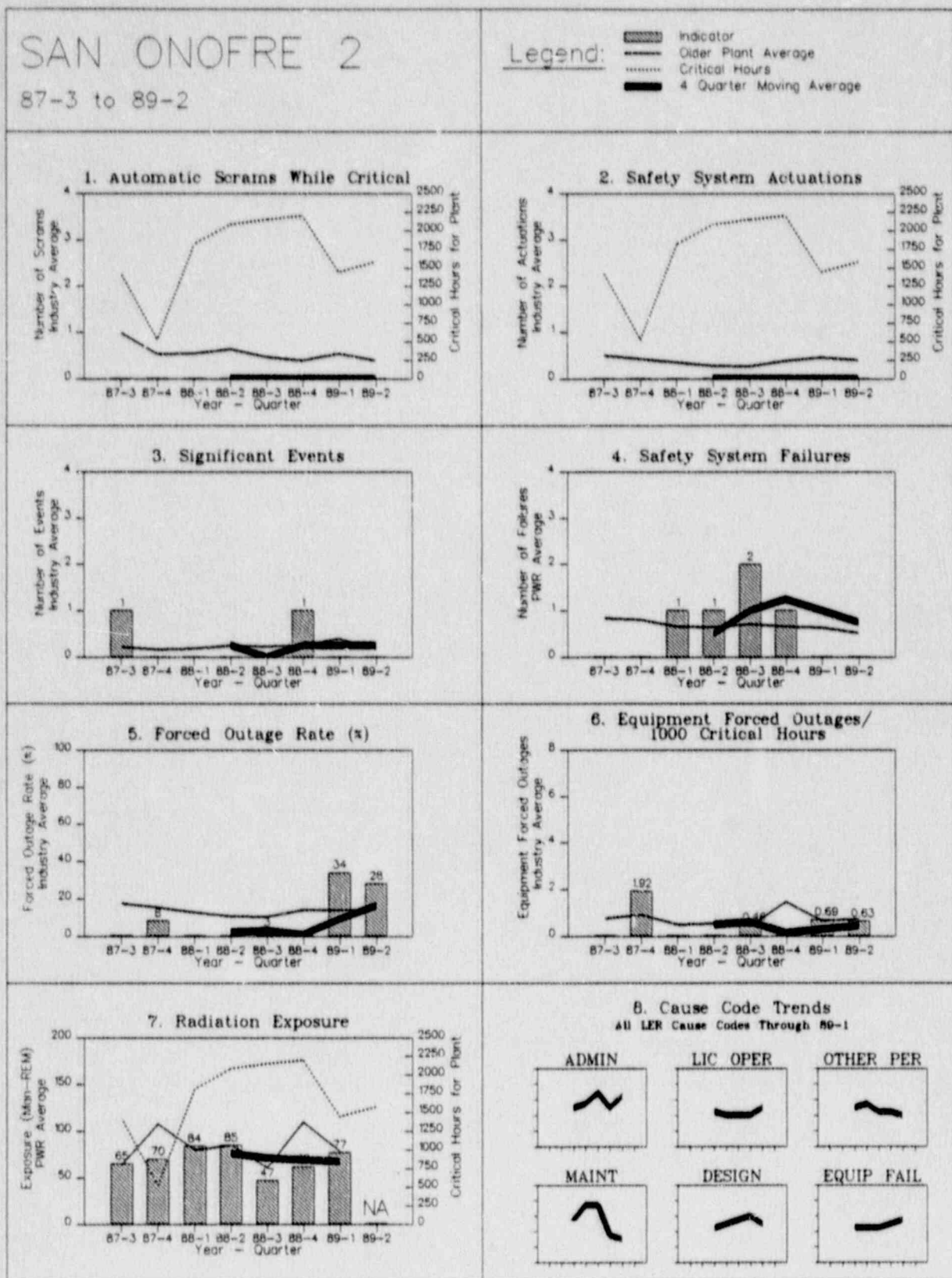


FIGURE 4.85

SAN ONOFRE 2

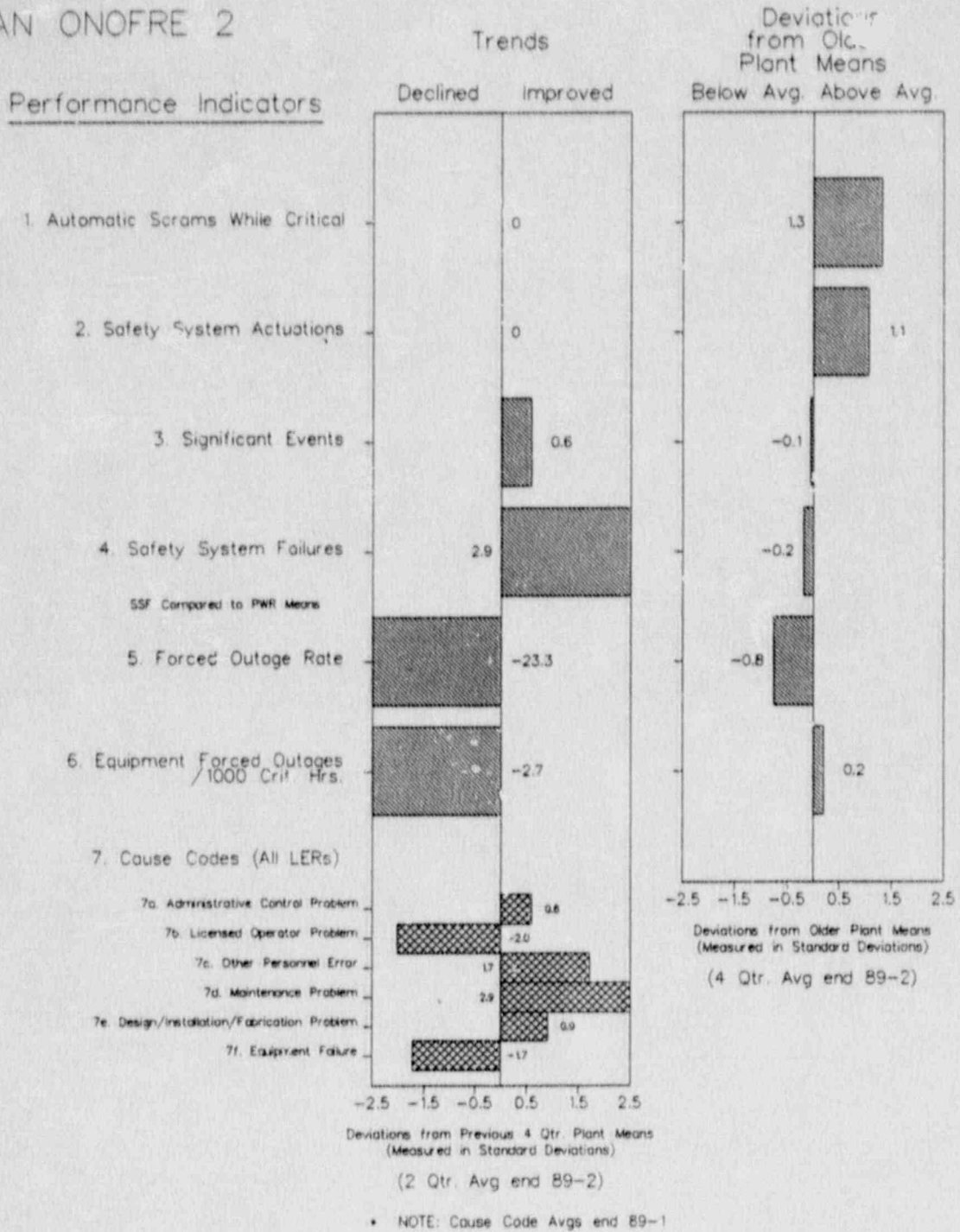


FIGURE 4.86

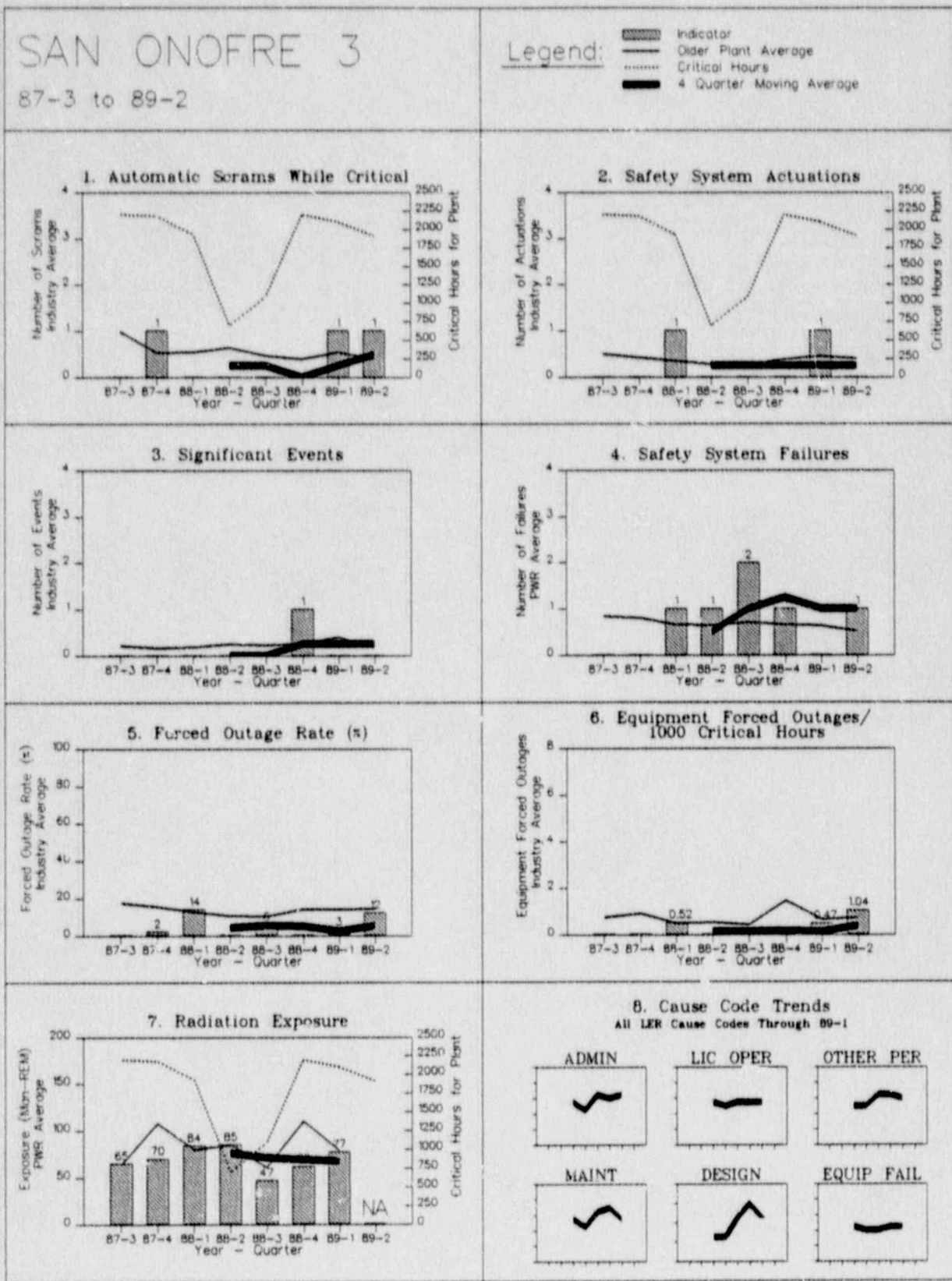




FIGURE 4.86

SAN ONOFRE 3

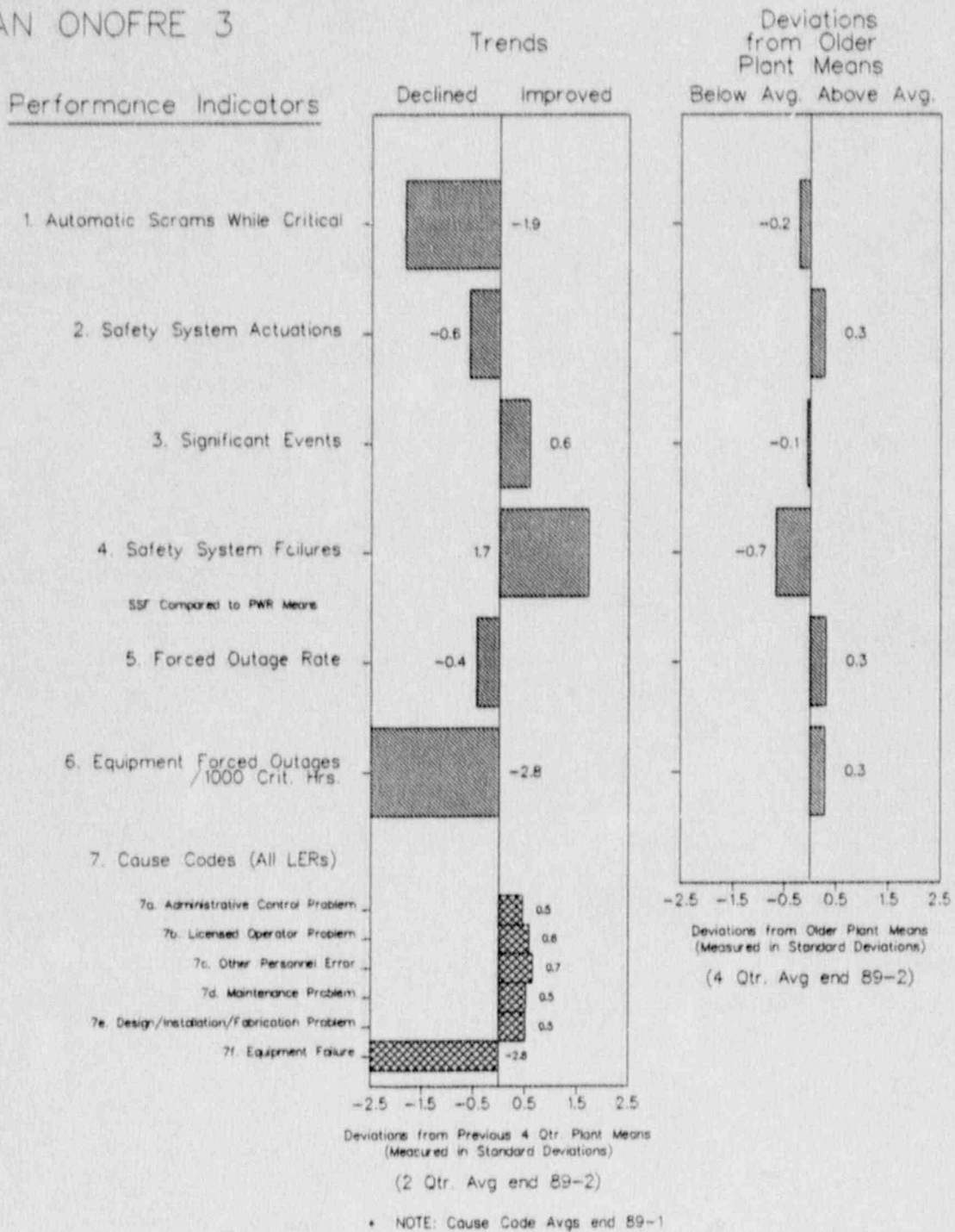


FIGURE 4.87

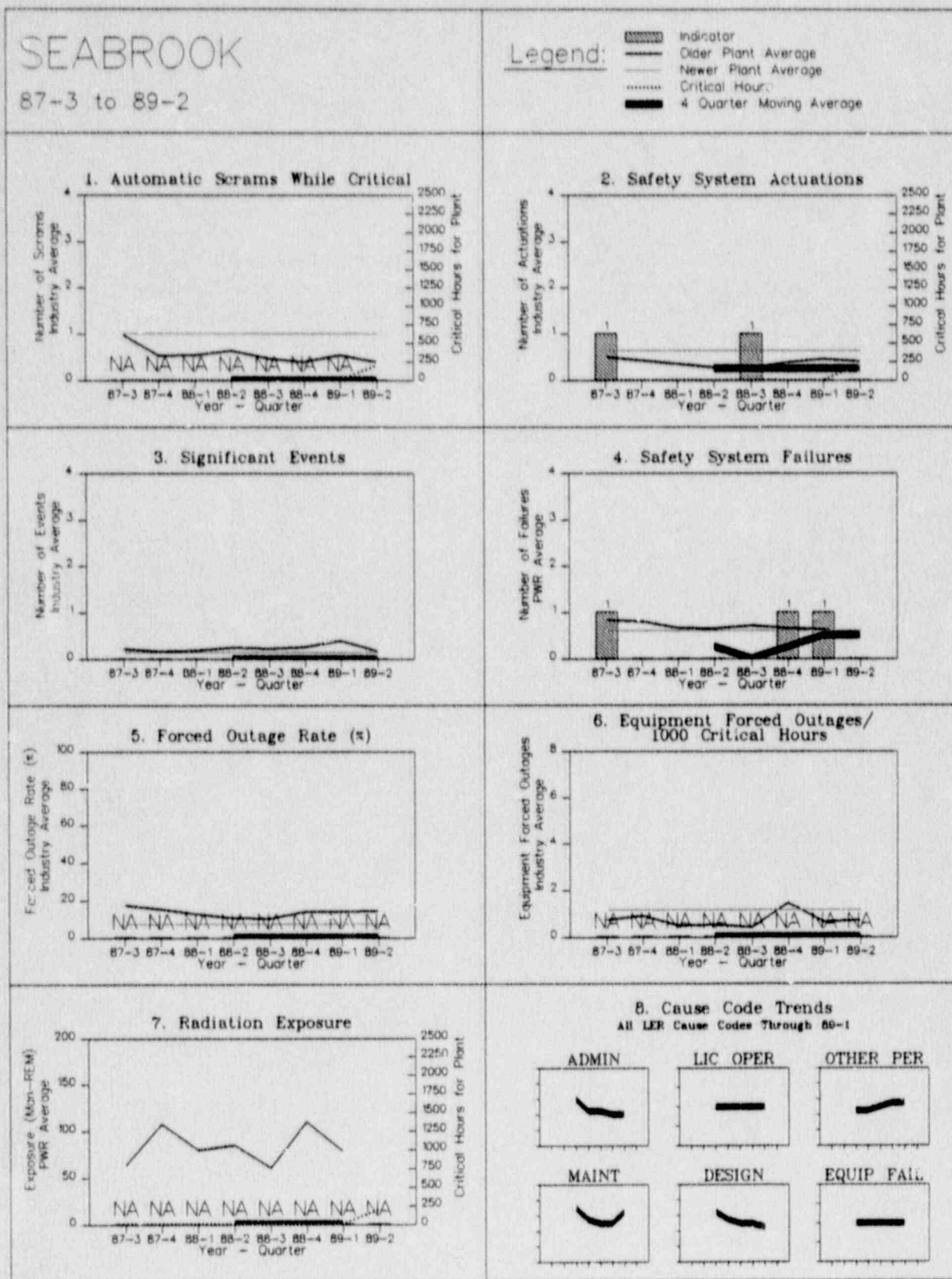
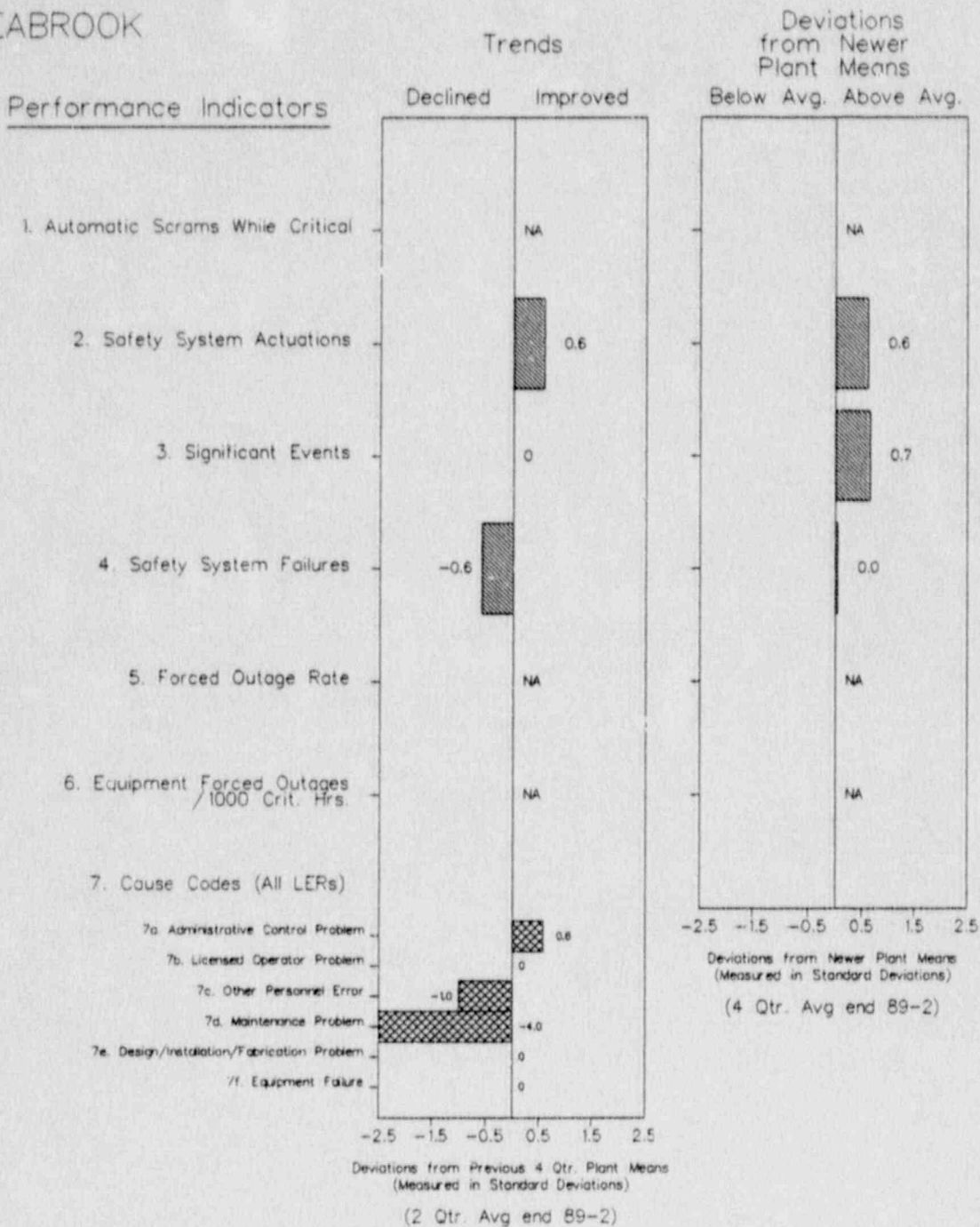


FIGURE 4.87

SEABROOK



\* NOTE: Cause Code Avgs end 80-1

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FIGURE 4.87

Note: This is a comparison of SEABROOK  
(a newer plant) against older plant means.

SEABROOK

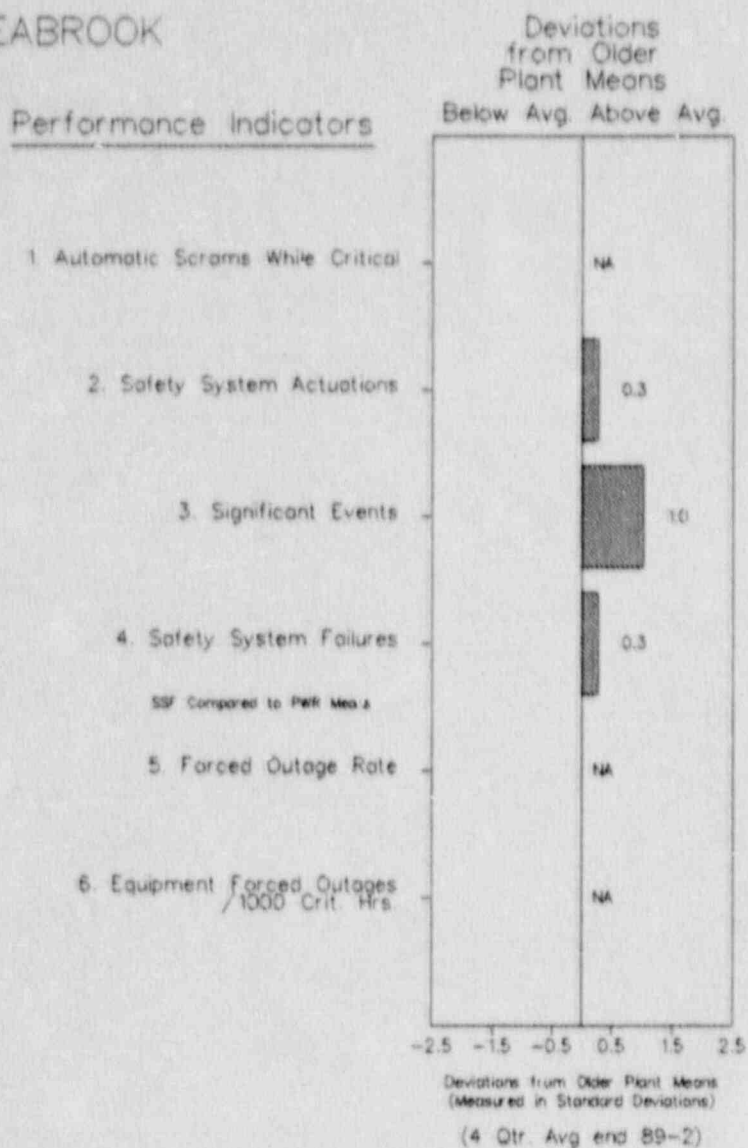


FIGURE 4.88

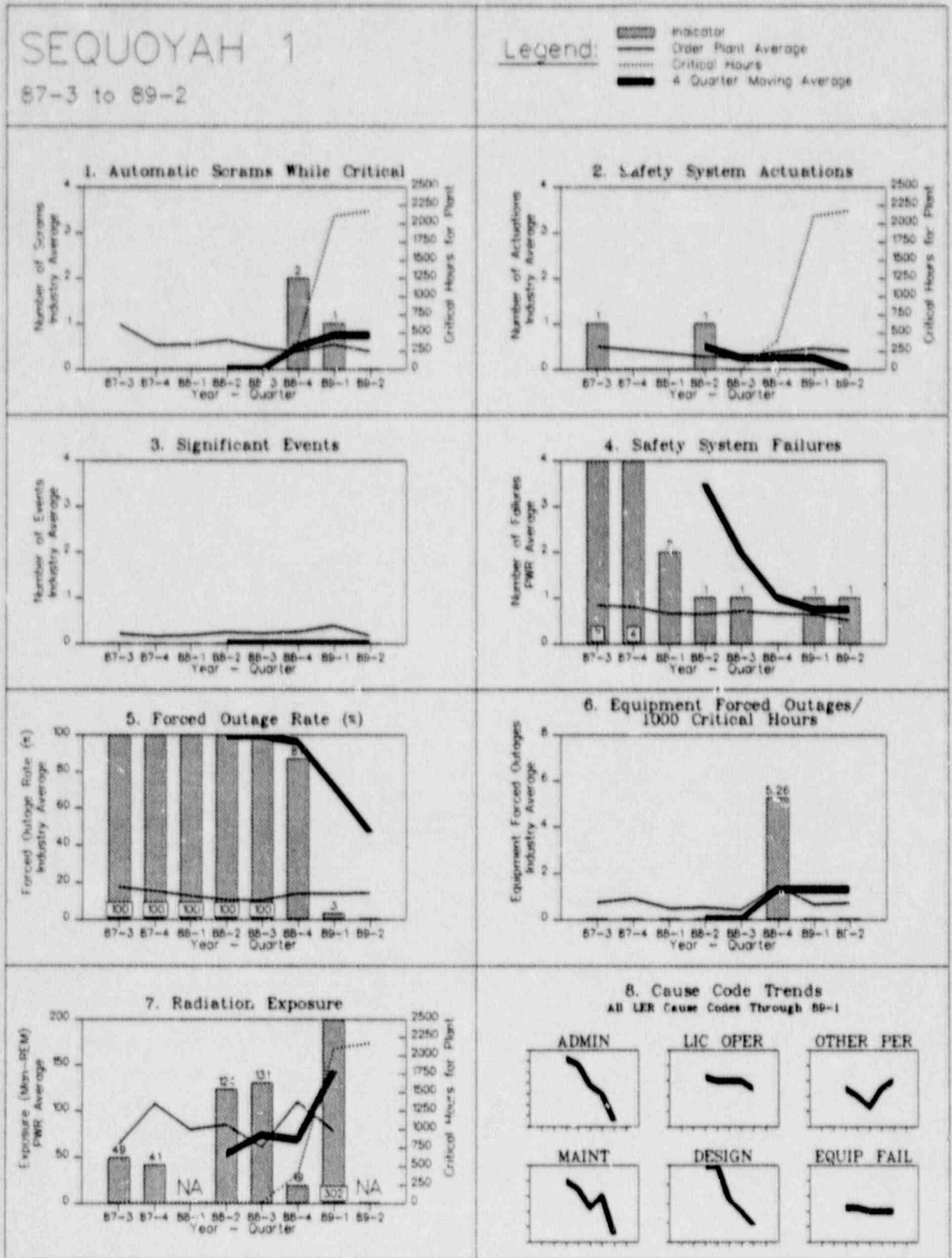


FIGURE 4.88

SEQUOYAH 1

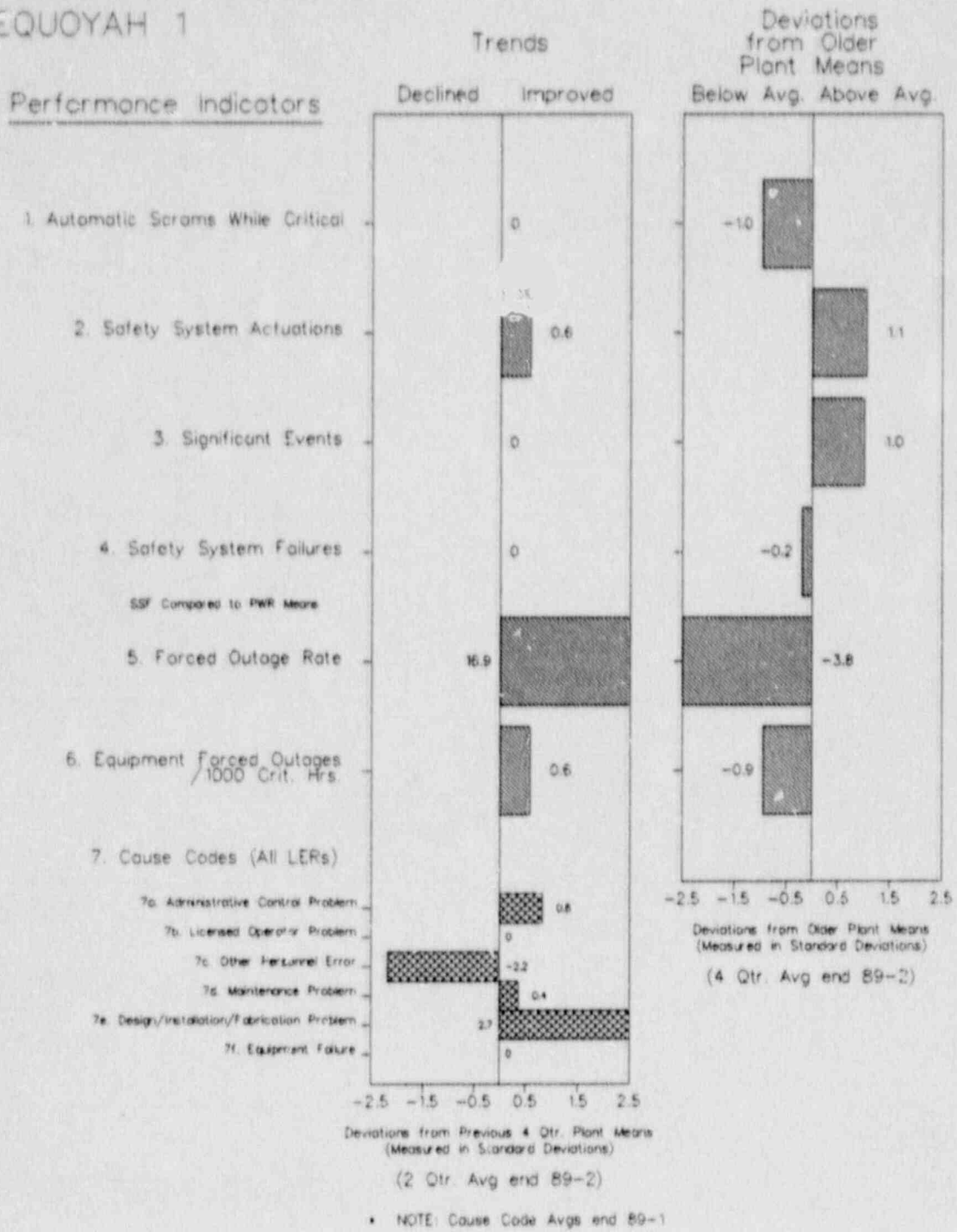


FIGURE 4.89

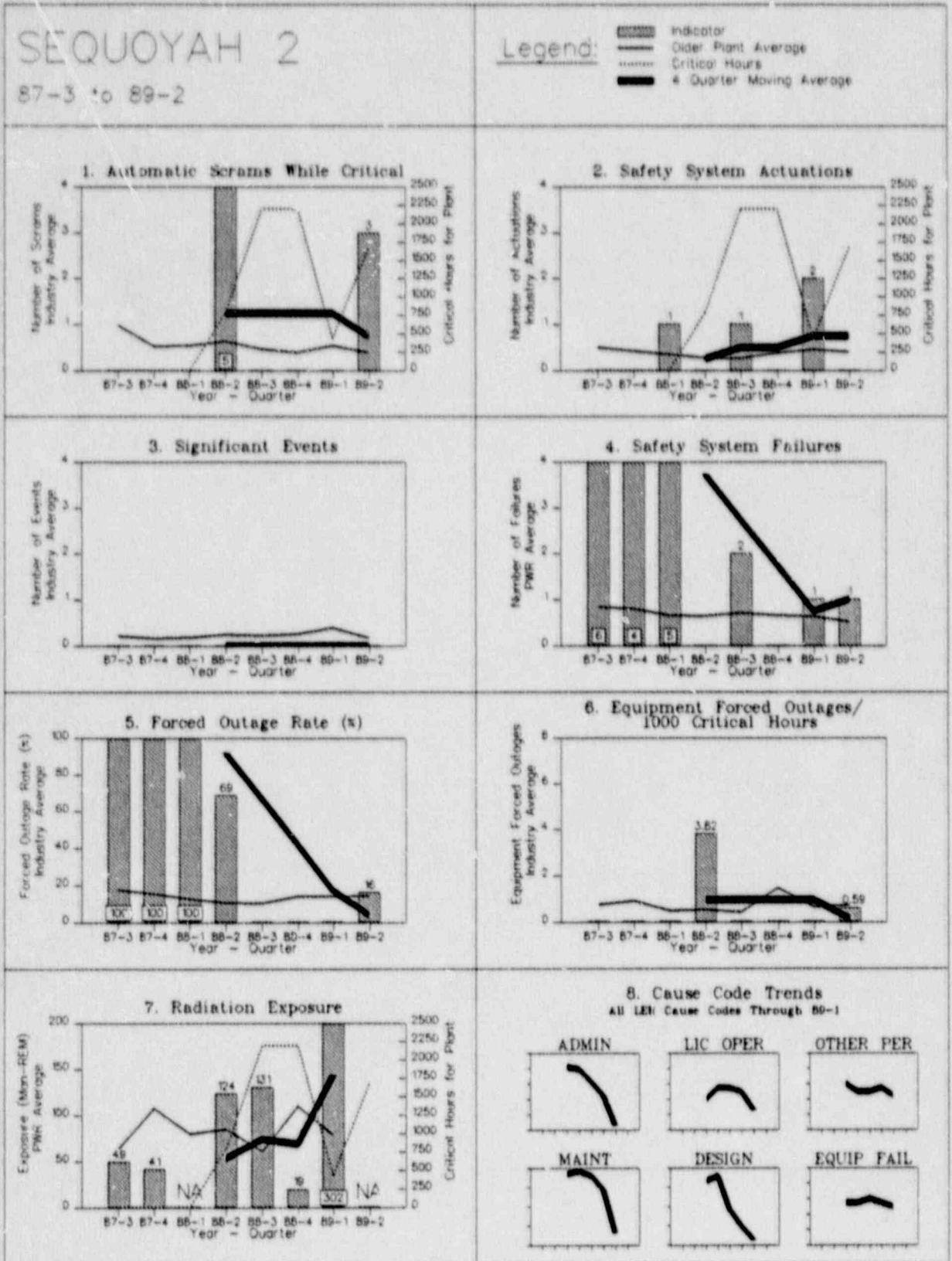




FIGURE 4.89

SEQUOYAH 2

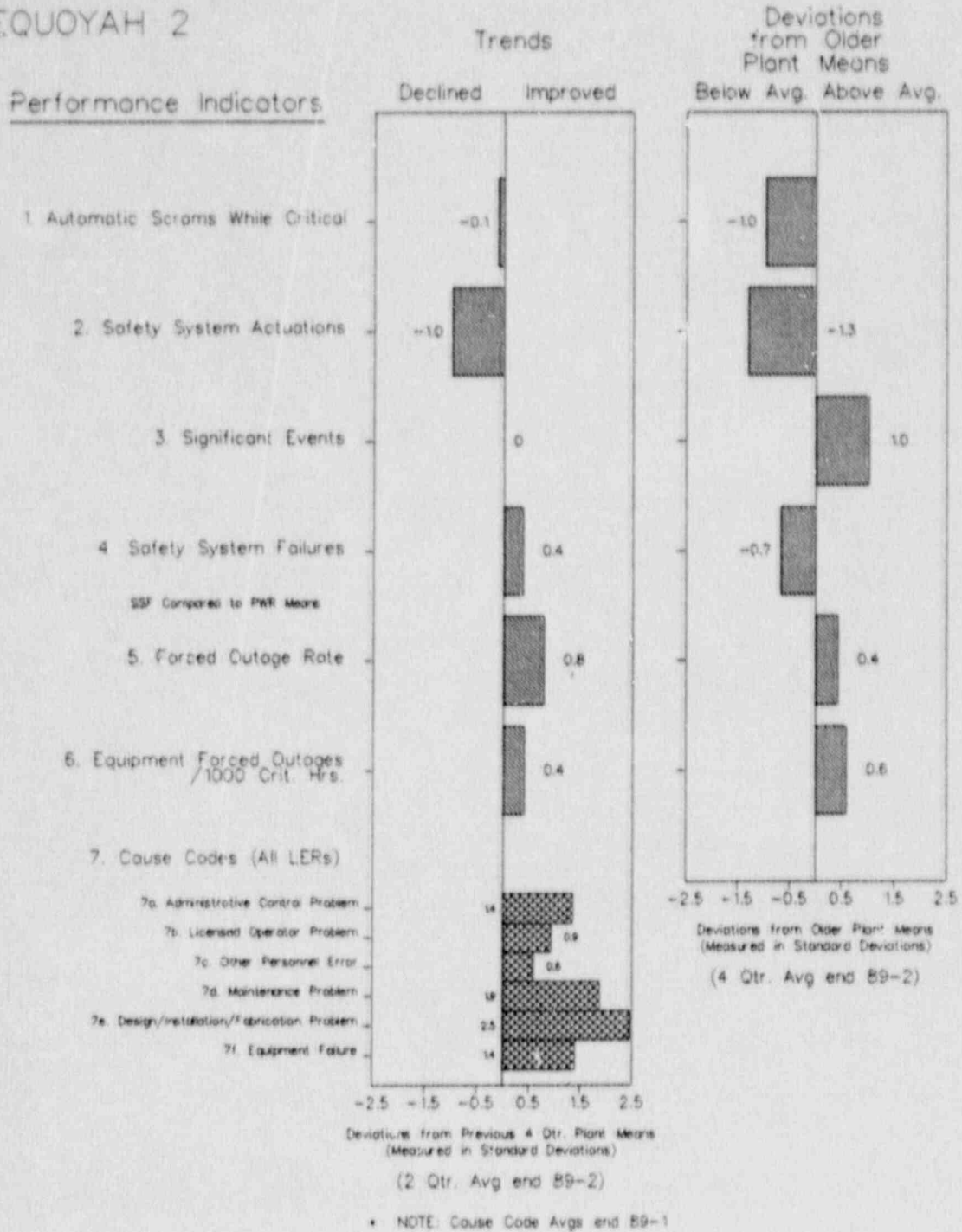


FIGURE 4.90

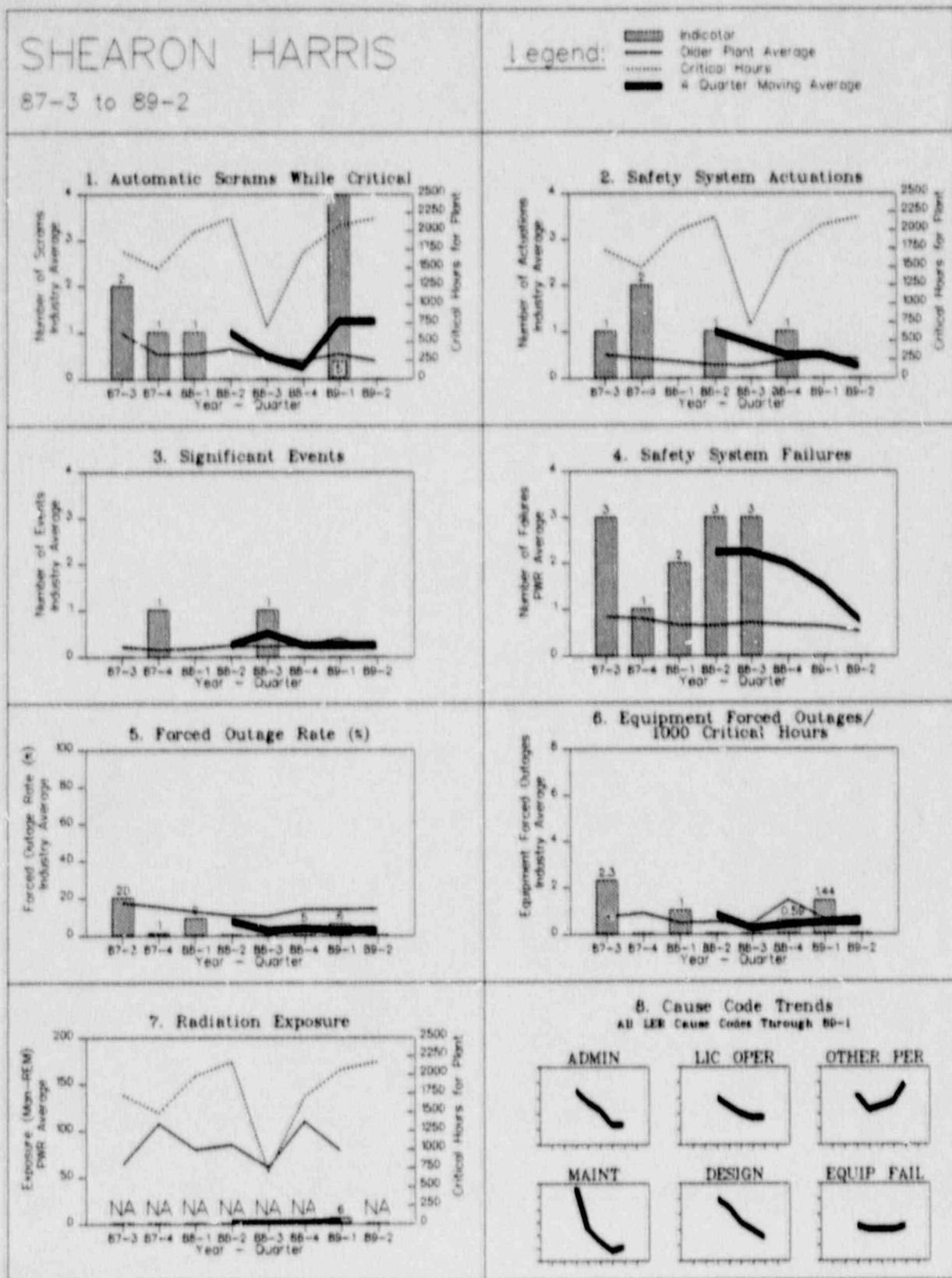


FIGURE 4.90

SHEARON HARRIS

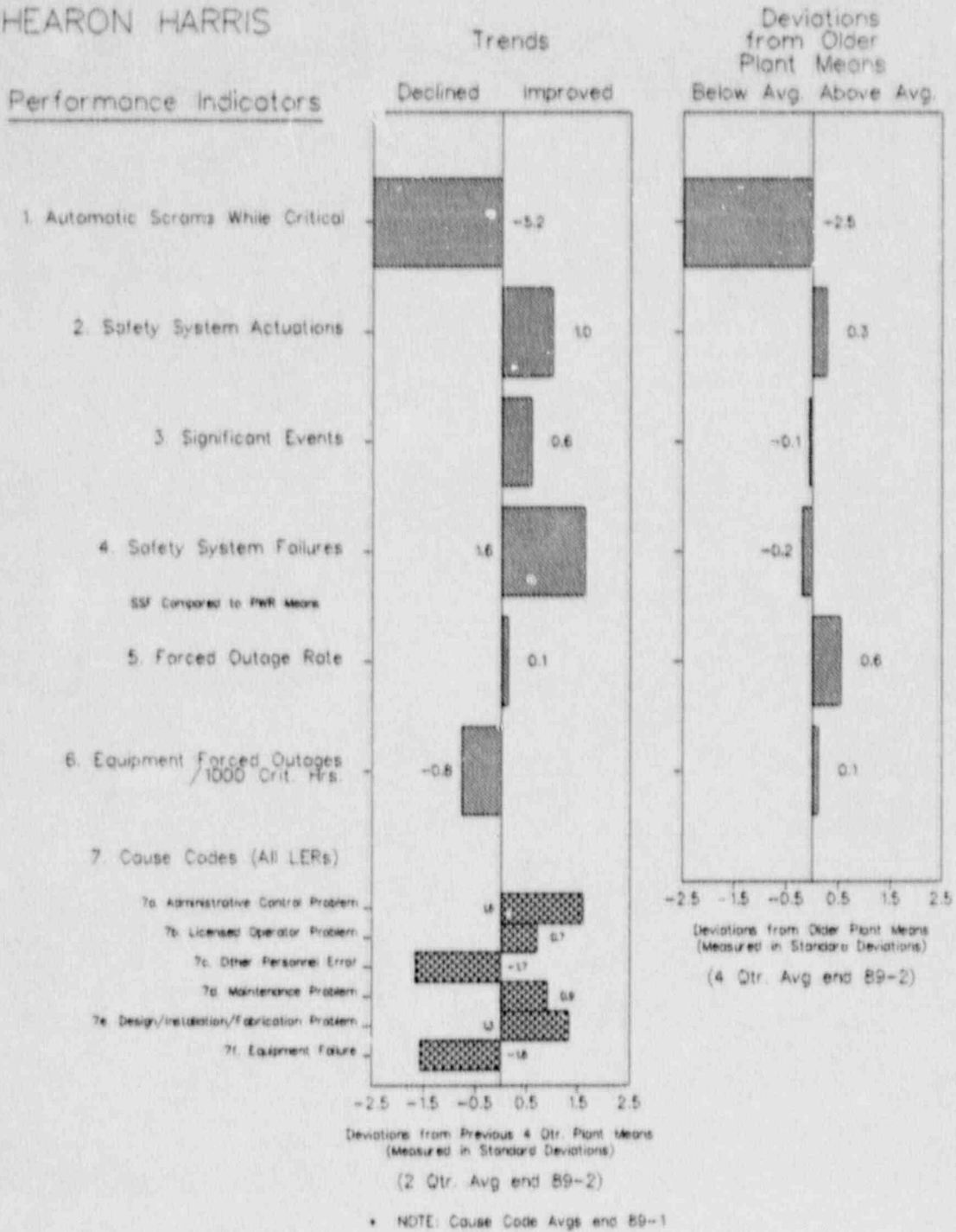


FIGURE 4.91

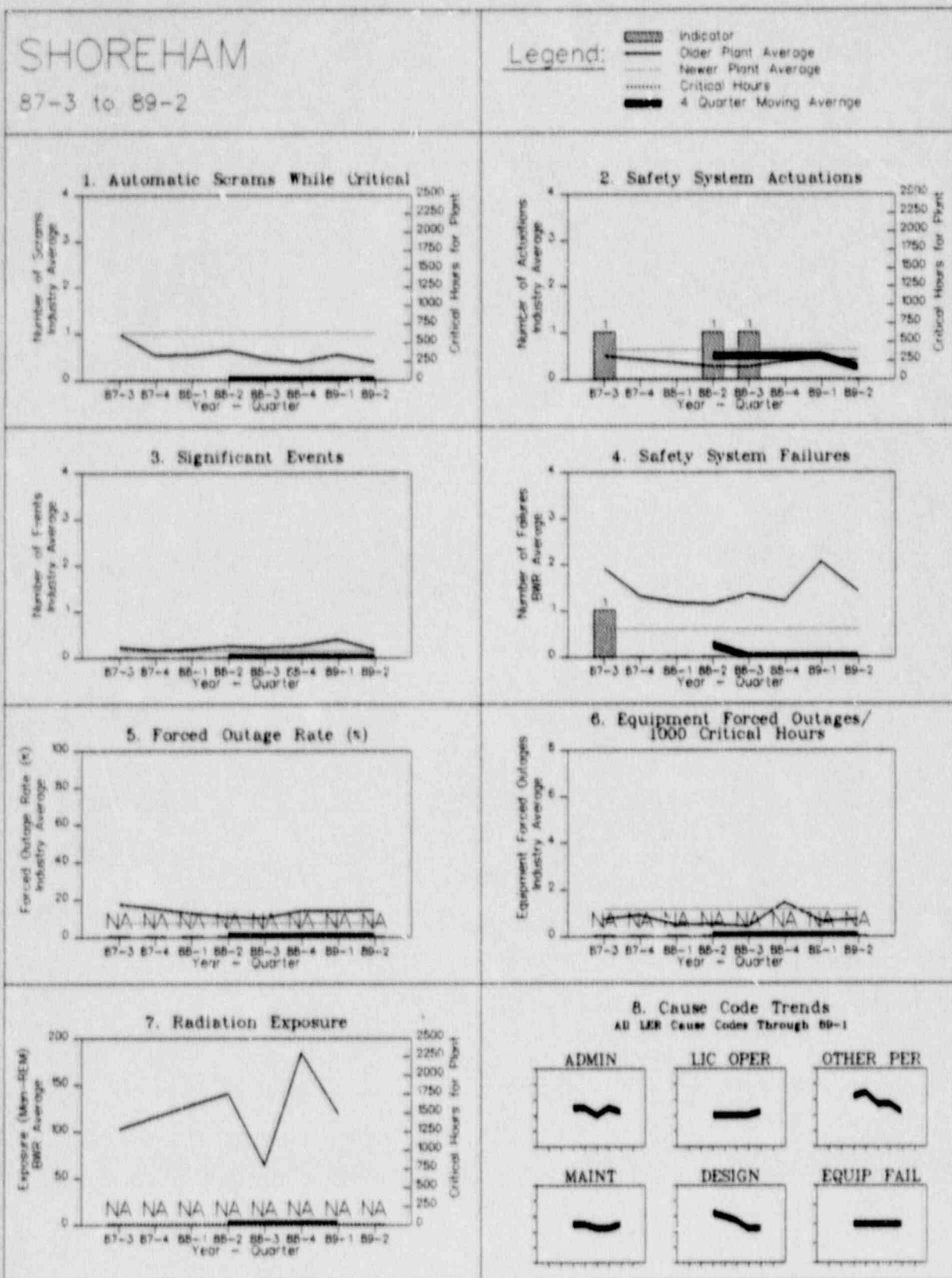
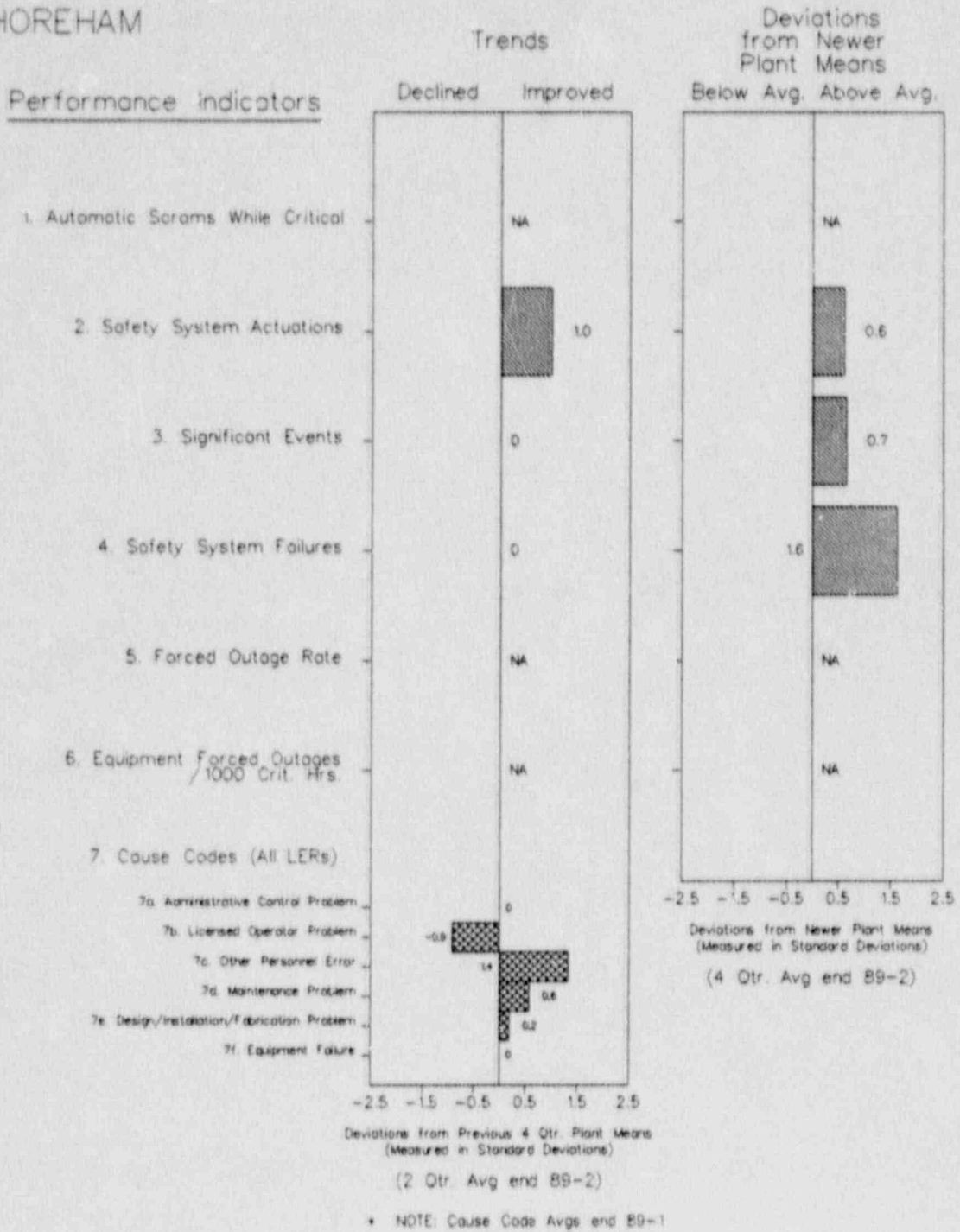


FIGURE 4.91

SHOREHAM



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FIGURE 4.91

Note: This is a comparison of SHOREHAM  
(a newer plant) against older plant means.

SHOREHAM

Deviations  
from Older  
Plant Means  
Below Avg. Above Avg.

Performance Indicators

1. Automatic Scrams While Critical

NA

2. Safety System Actuations

0.3

3. Significant Events

1.0

4. Safety System Failures

1.8

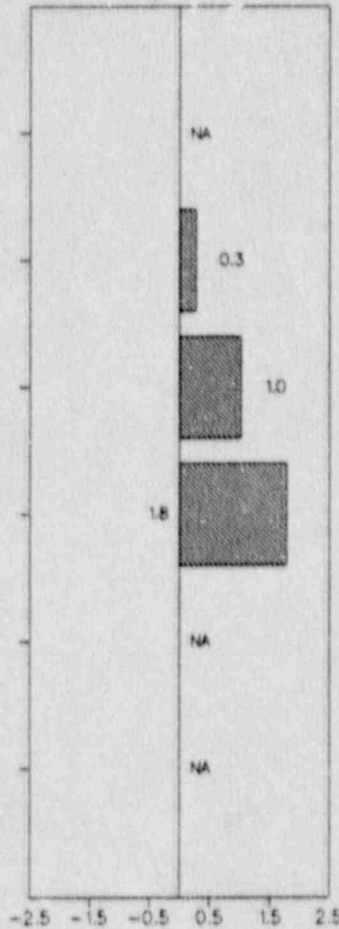
SDF Compared to BWR Means

5. Forced Outage Rate

NA

6. Equipment Forced Outages  
/ 1000 Crit. Hrs.

NA



Deviations from Older Plant Means

(Measured in Standard Deviations)

(4 Qtr. Avg end 89-2)

FIGURE 4.92

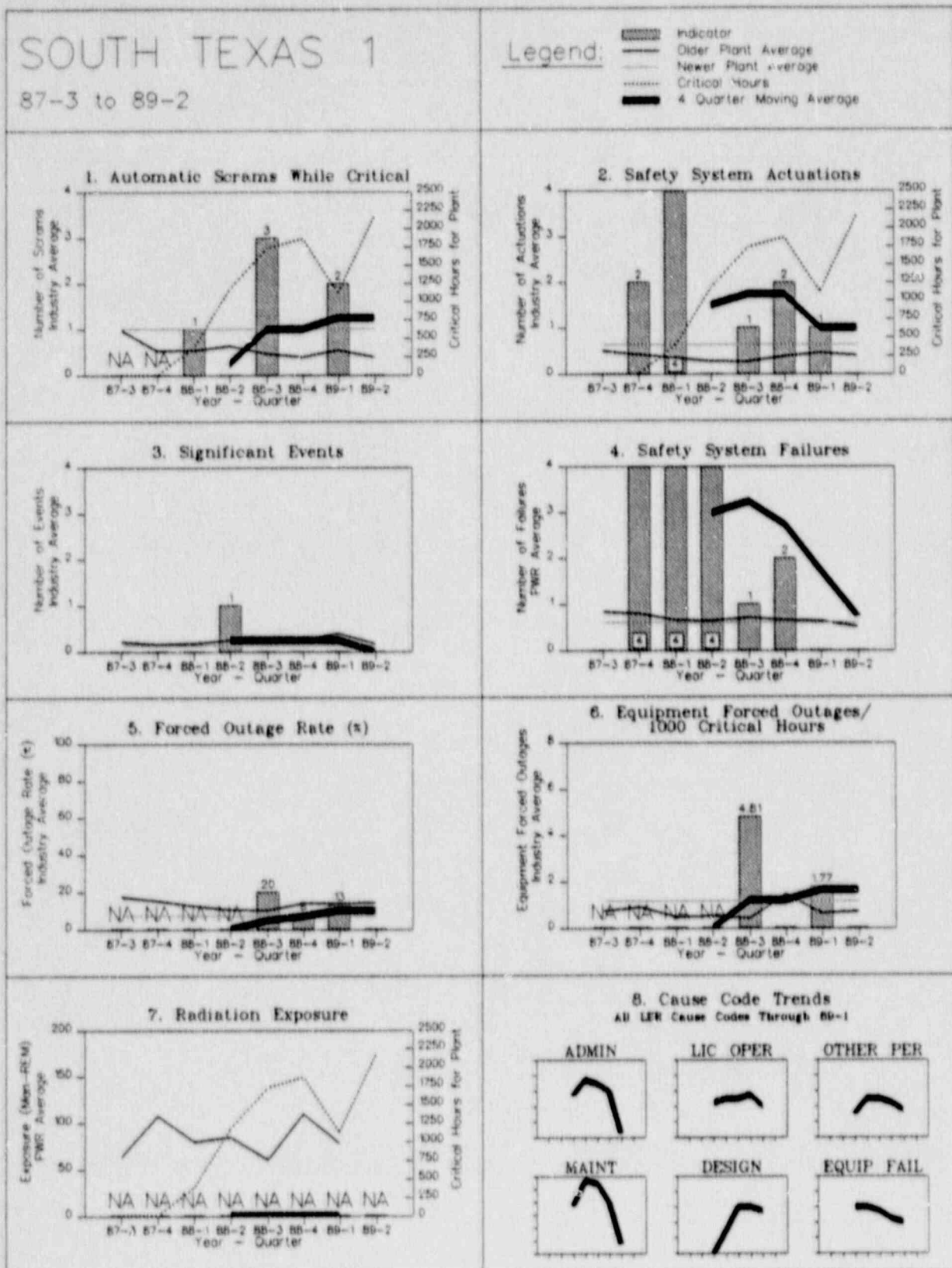
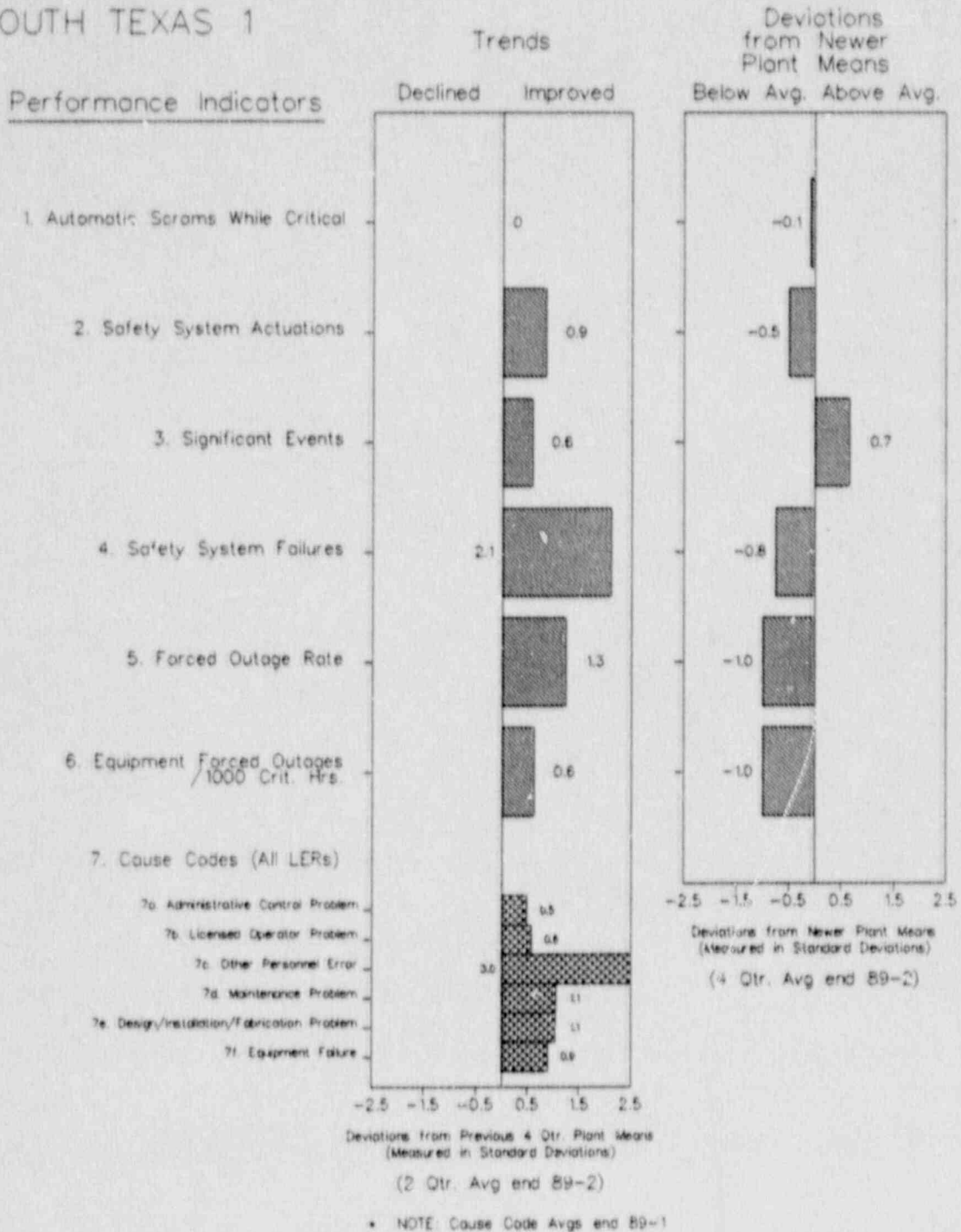




FIGURE 4.92

SOUTH TEXAS 1



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FIGURE 4.92

Note: This is a comparison of SOUTH TEXAS 1  
(a newer plant) against older plant means.

SOUTH TEXAS 1

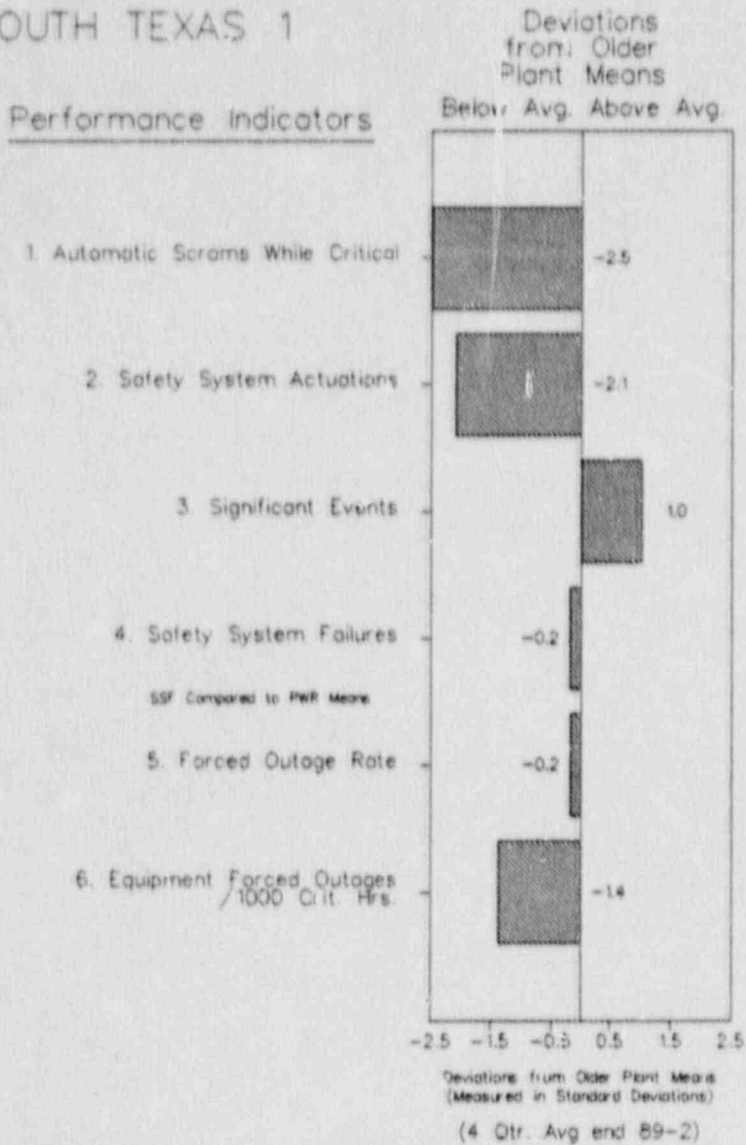


FIGURE 4.93

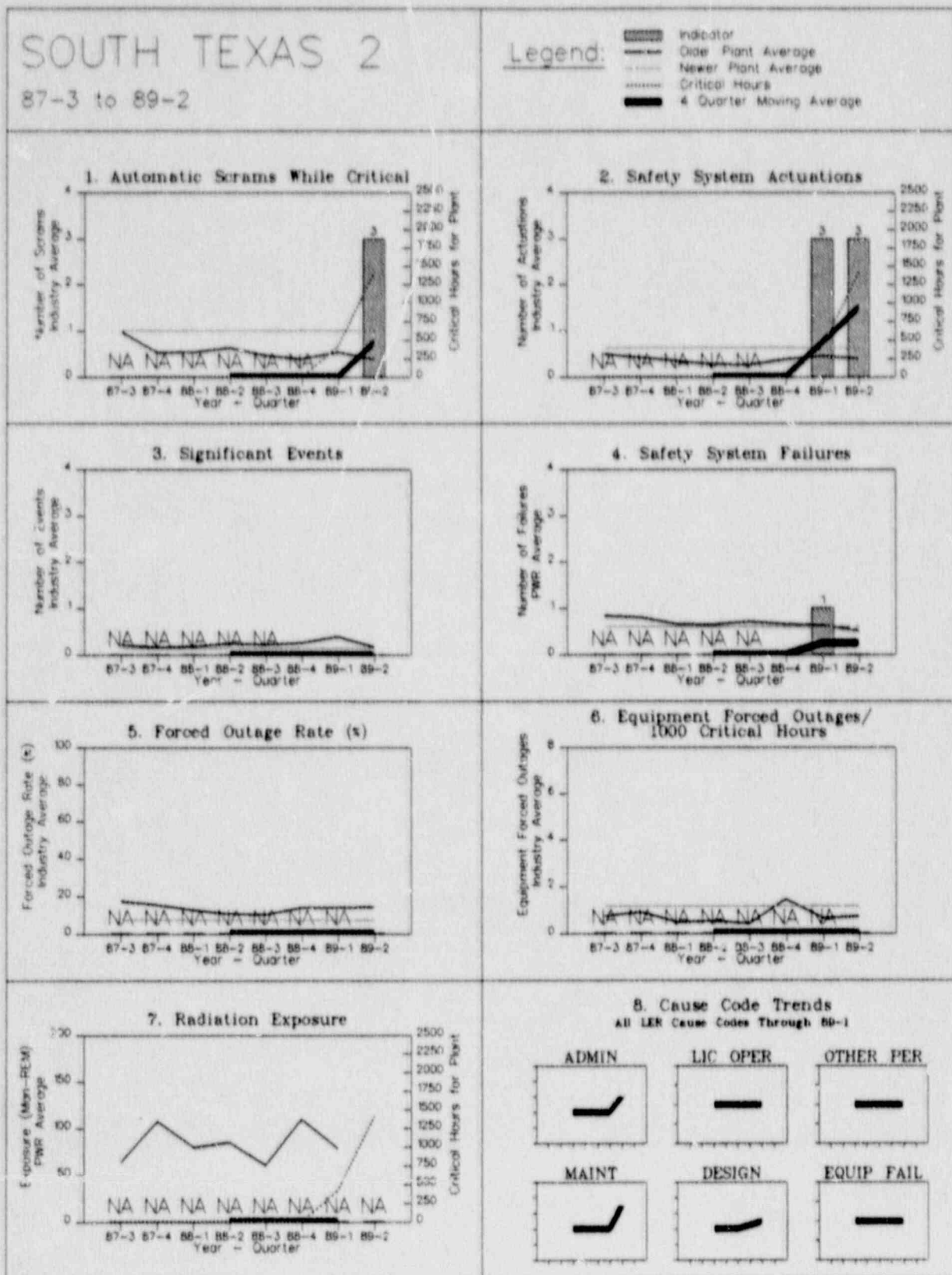
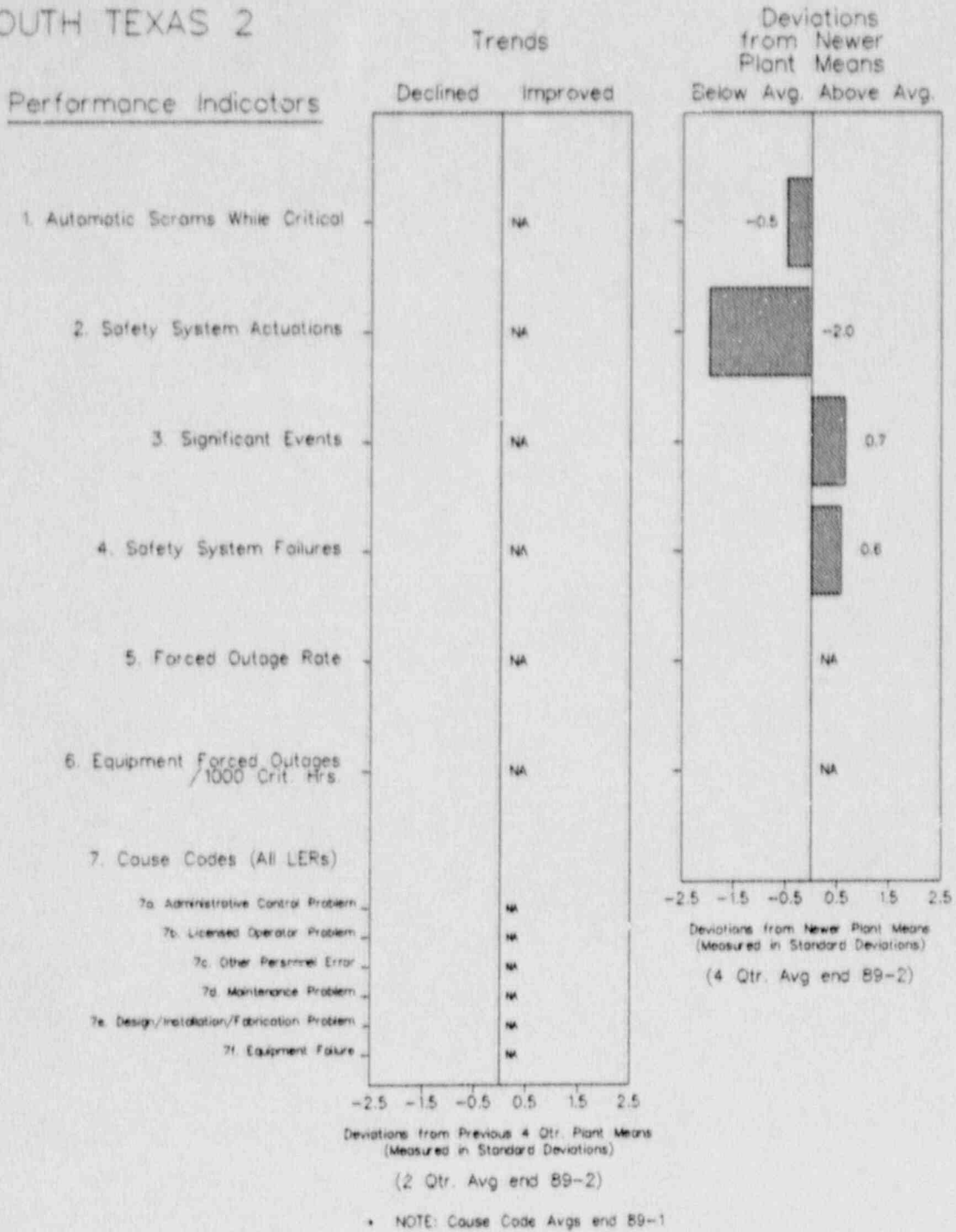


FIGURE 4.93

SOUTH TEXAS 2



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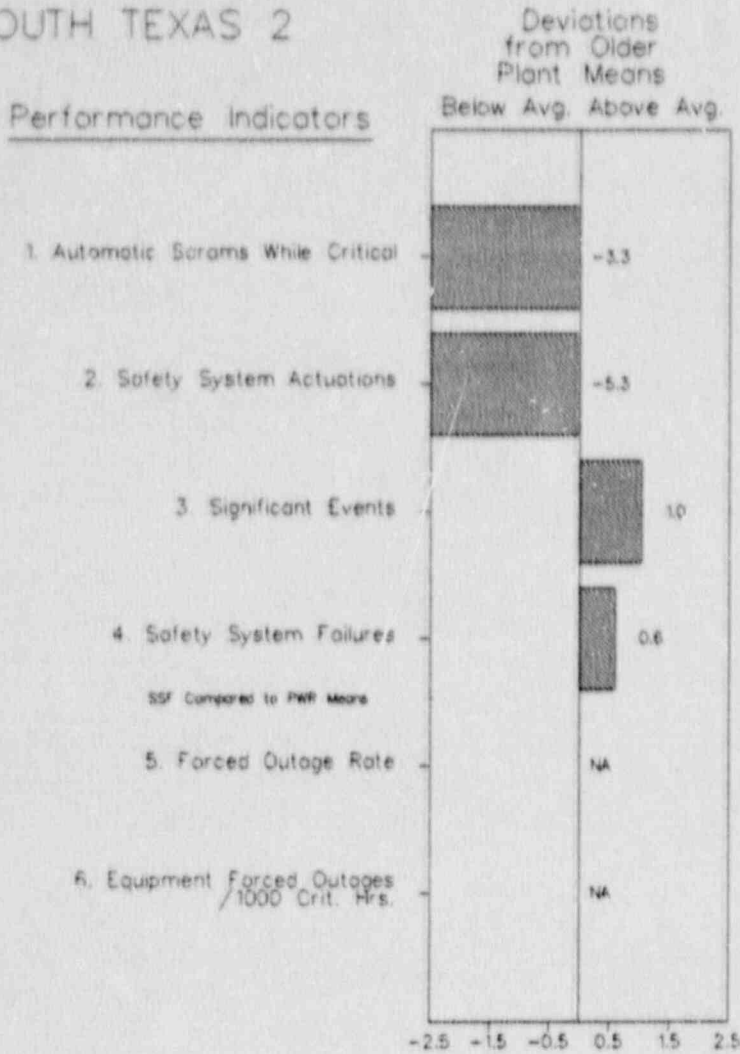
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FIGURE 4.93

Note: This is a comparison of SOUTH TEXAS 2  
(a newer plant) against older plant means.

SOUTH TEXAS 2



Deviations from Older Plant means  
(Measured in Standard Deviations)

(4 Qtr. Avg. end 89-2)

FIGURE 4.94

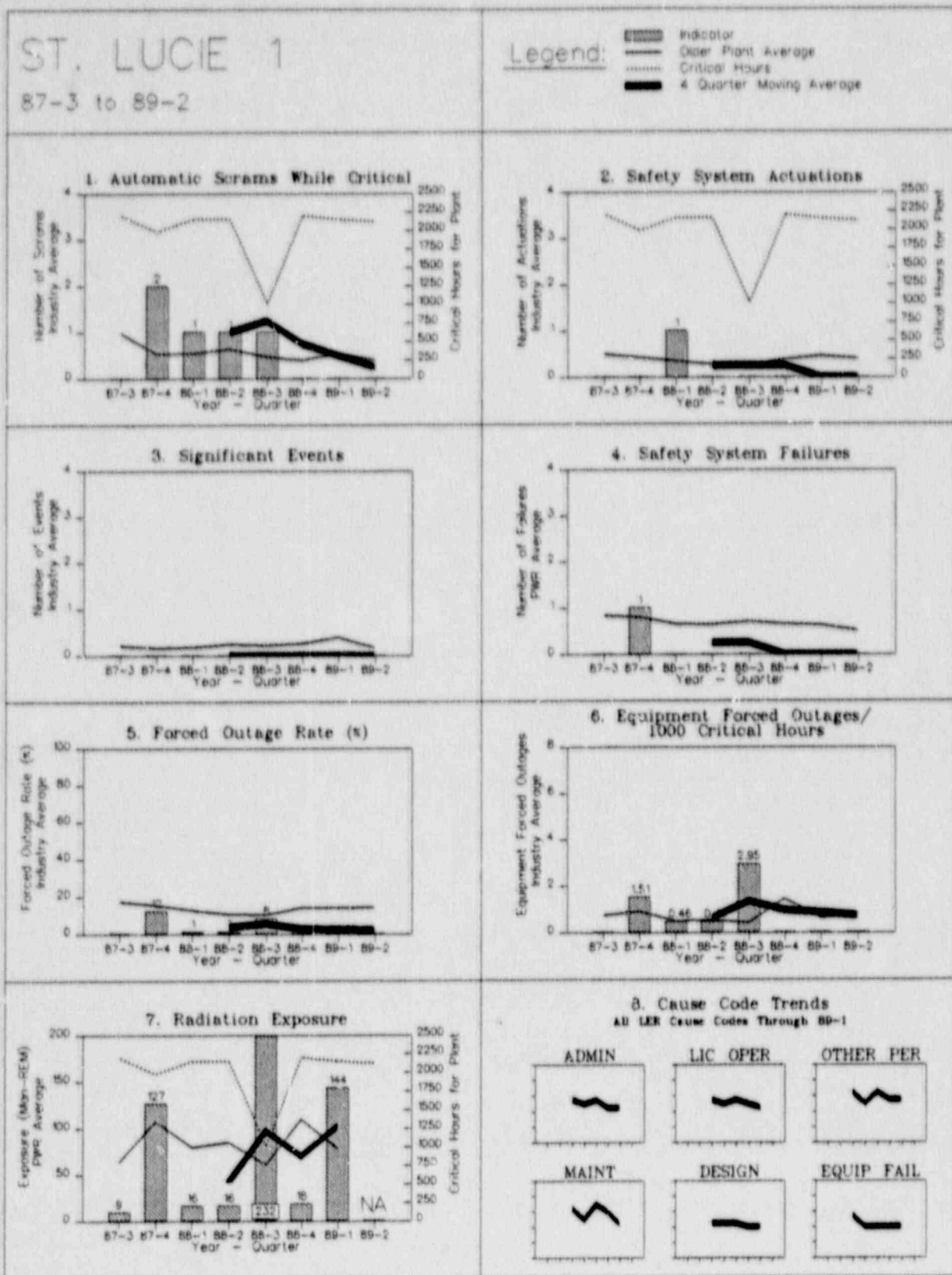




FIGURE 4.94

ST. LUCIE 1

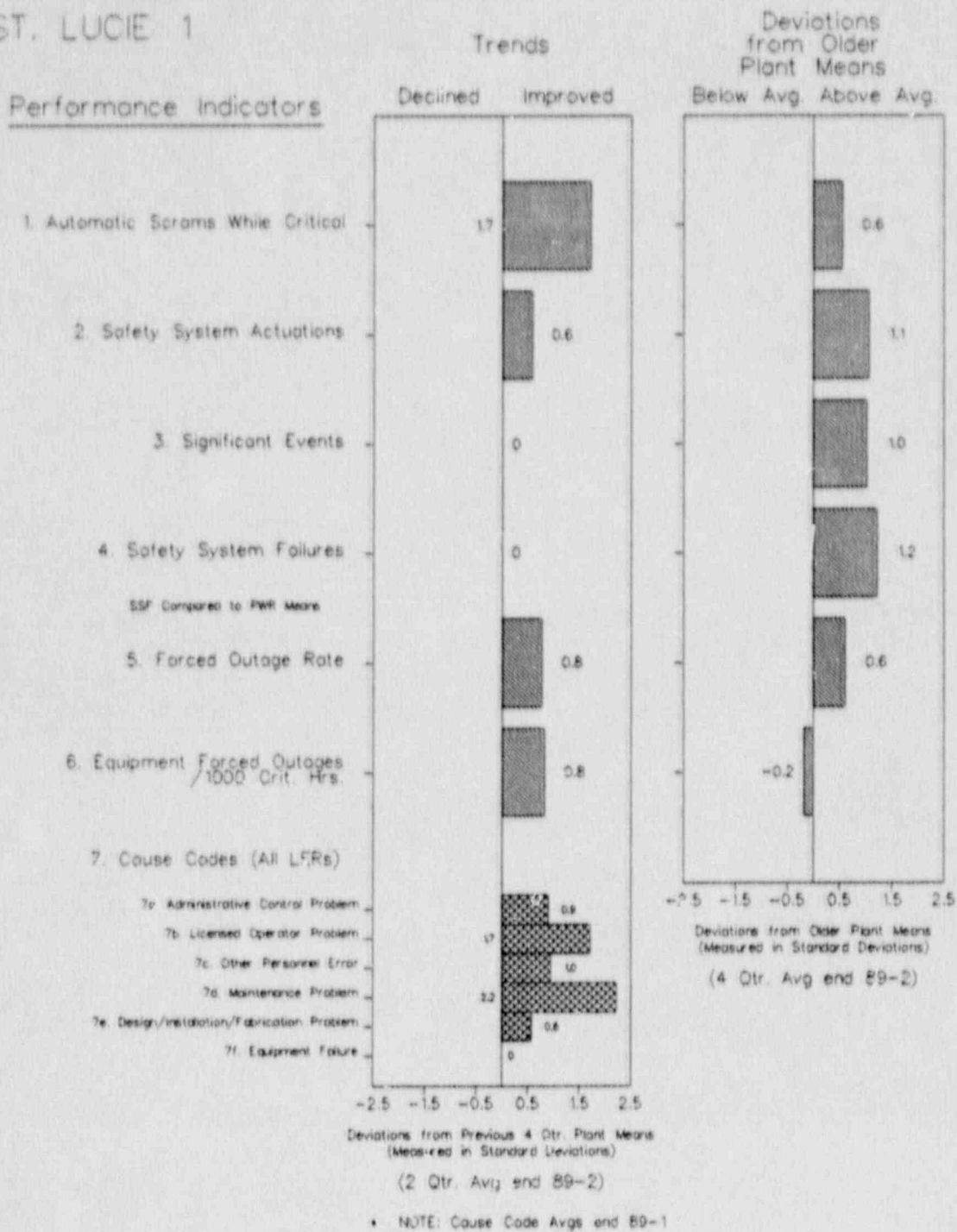


FIGURE 4.95

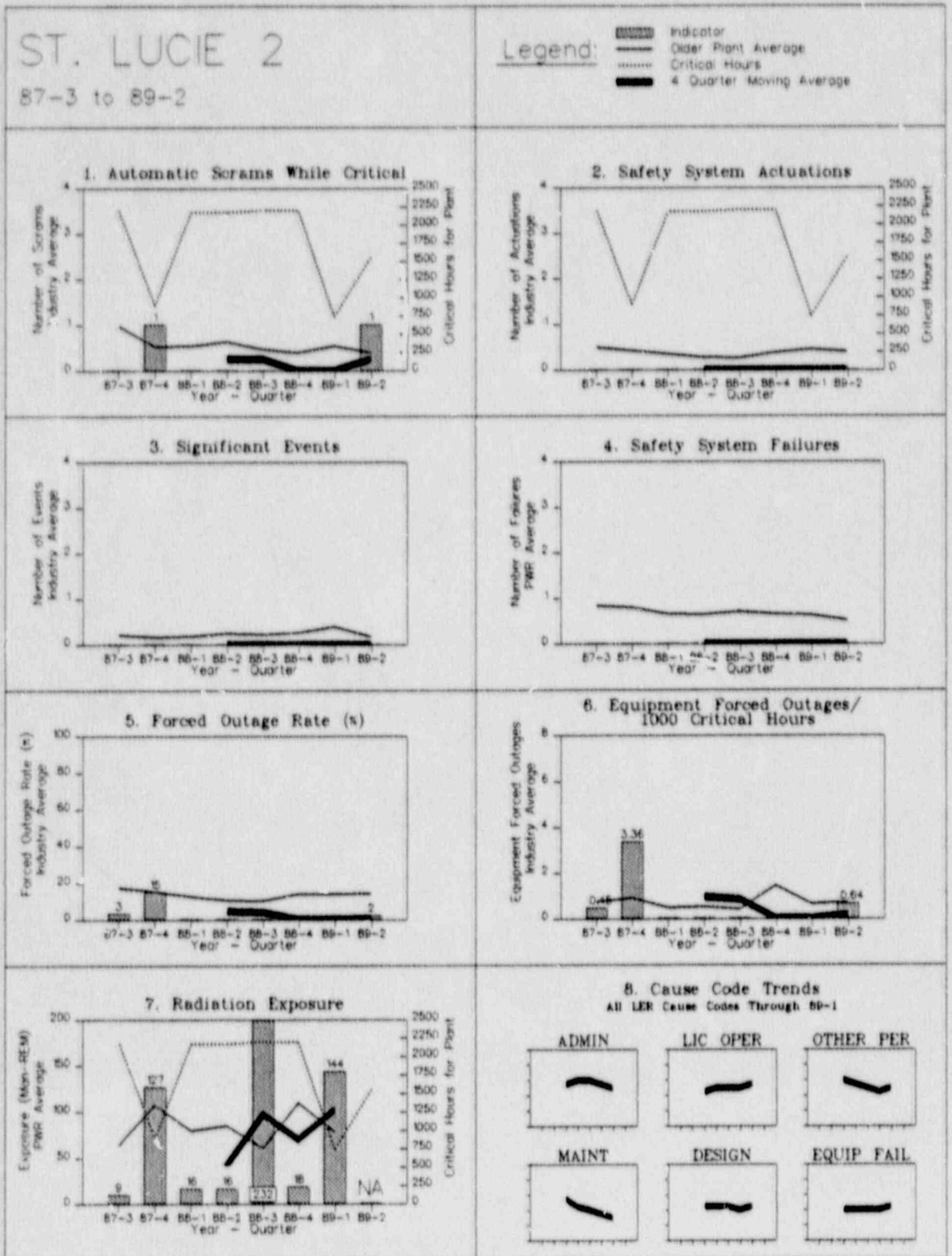


FIGURE 4.95

ST. LUCIE 2

Performance Indicators

Trends

Declined Improved

Deviations from Older Plant Means

Below Avg. Above Avg.

1. Automatic Scrams While Critical

-0.9

0.6

2. Safety System Actuations

0

1.1

3. Significant Events

0

1.0

4. Safety System Failures

0

1.2

SSF Compared to PWR Means

5. Forced Outage Rate

-0.1

0.8

6. Equipment Forced Outages / 1000 Crit. Hrs

-0.4

0.6

7. Cause Codes (All LERs)

7a. Administrative Control Problem

0.7

7b. Licensed Operator Problem

-1.0

7c. Other Personnel Error

0

7d. Maintenance Problem

0.7

7e. Design/Installation/Fabrication Problem

-0.8

7f. Equipment Failure

-2.8

-2.5 -1.5 -0.5 0.5 1.5 2.5

Deviations from Previous 4 Qtr. Plant Means (Measured in Standard Deviations)

(2 Qtr. Avg end 89-2)

-2.5 -1.5 -0.5 0.5 1.5 2.5

Deviations from Older Plant Means (Measured in Standard Deviations)

(4 Qtr. Avg end 89-2)

\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.96

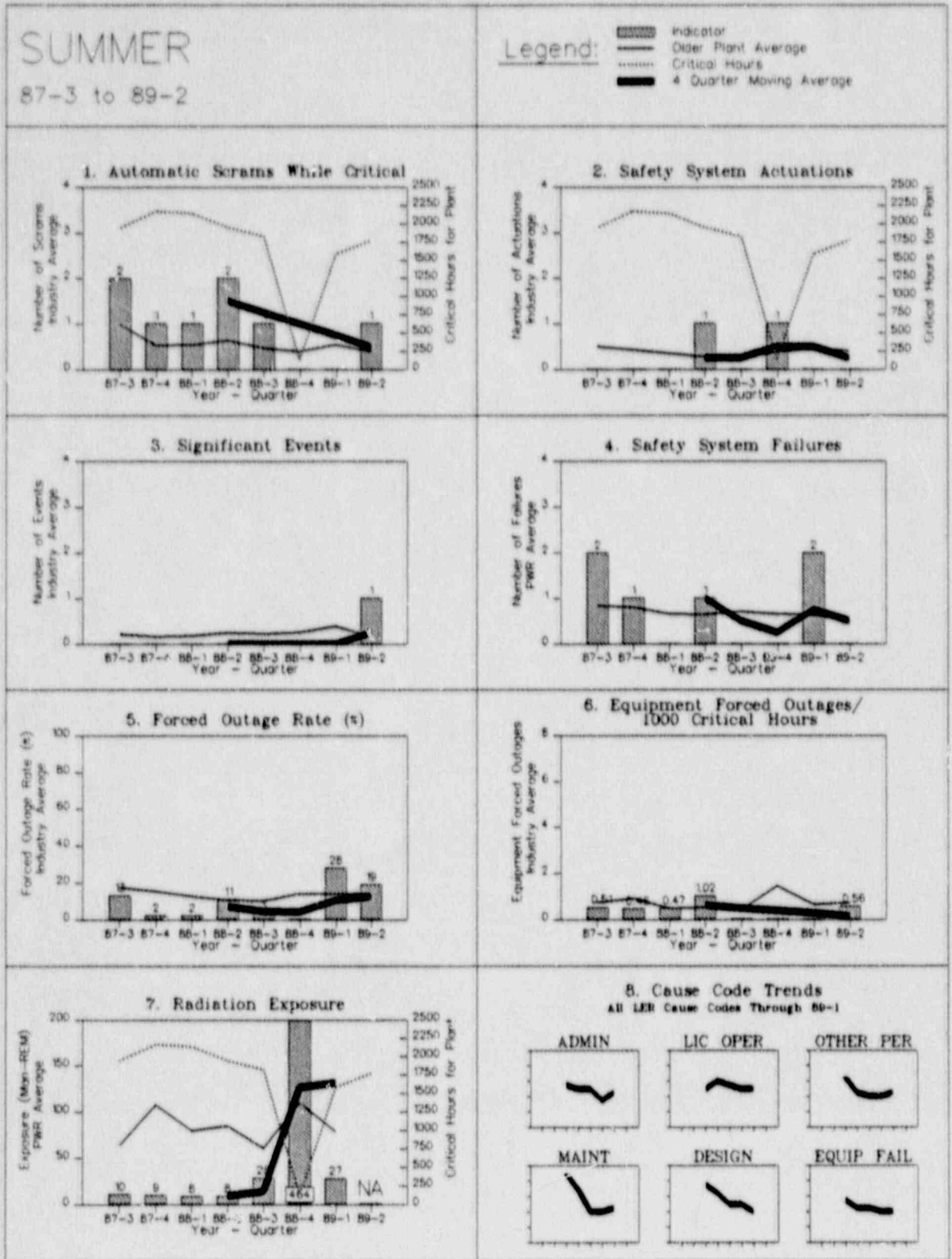
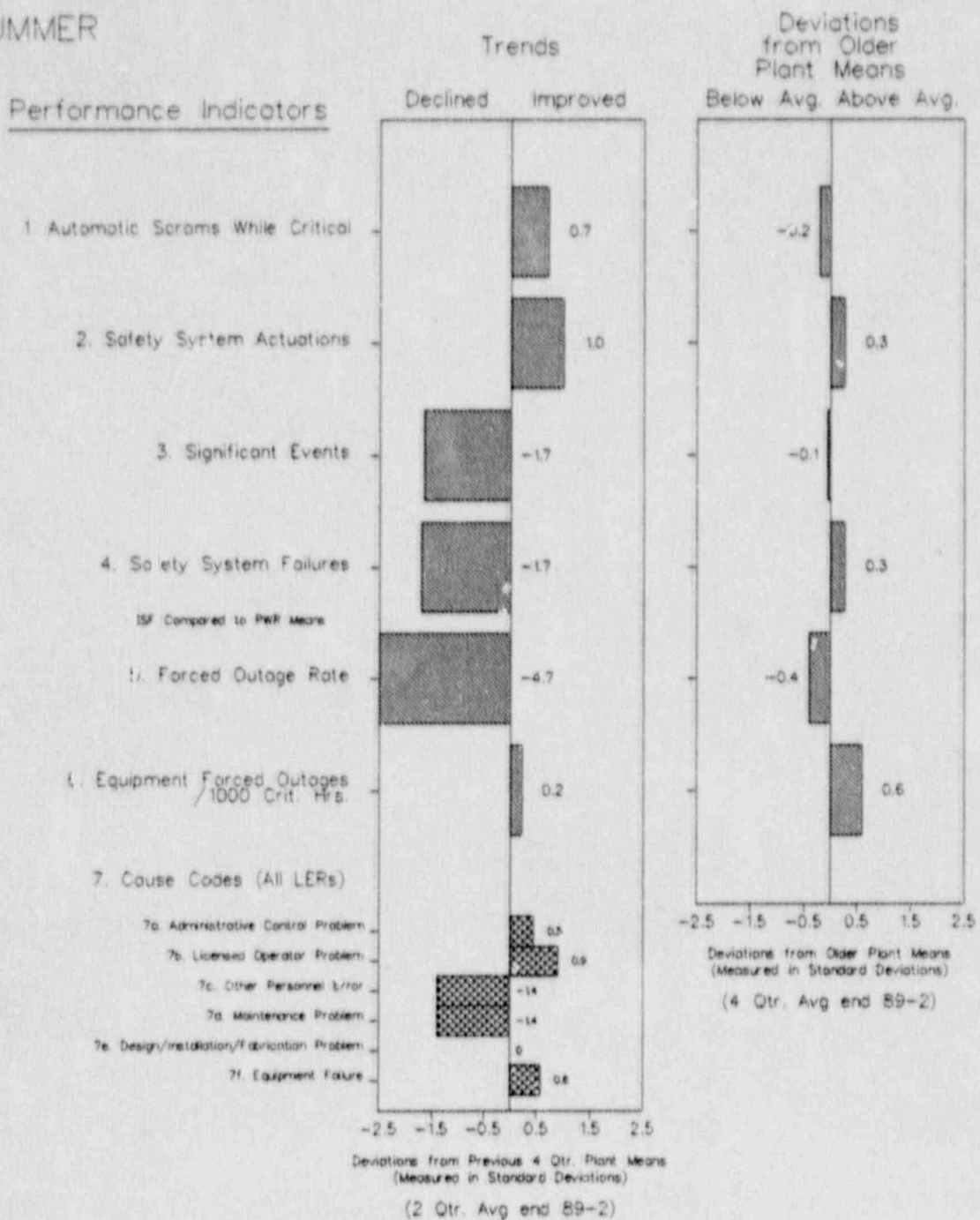


FIGURE 4.96

SUMMER



• NOTE: Cause Code Avgs end 89-1

FIGURE 4.97

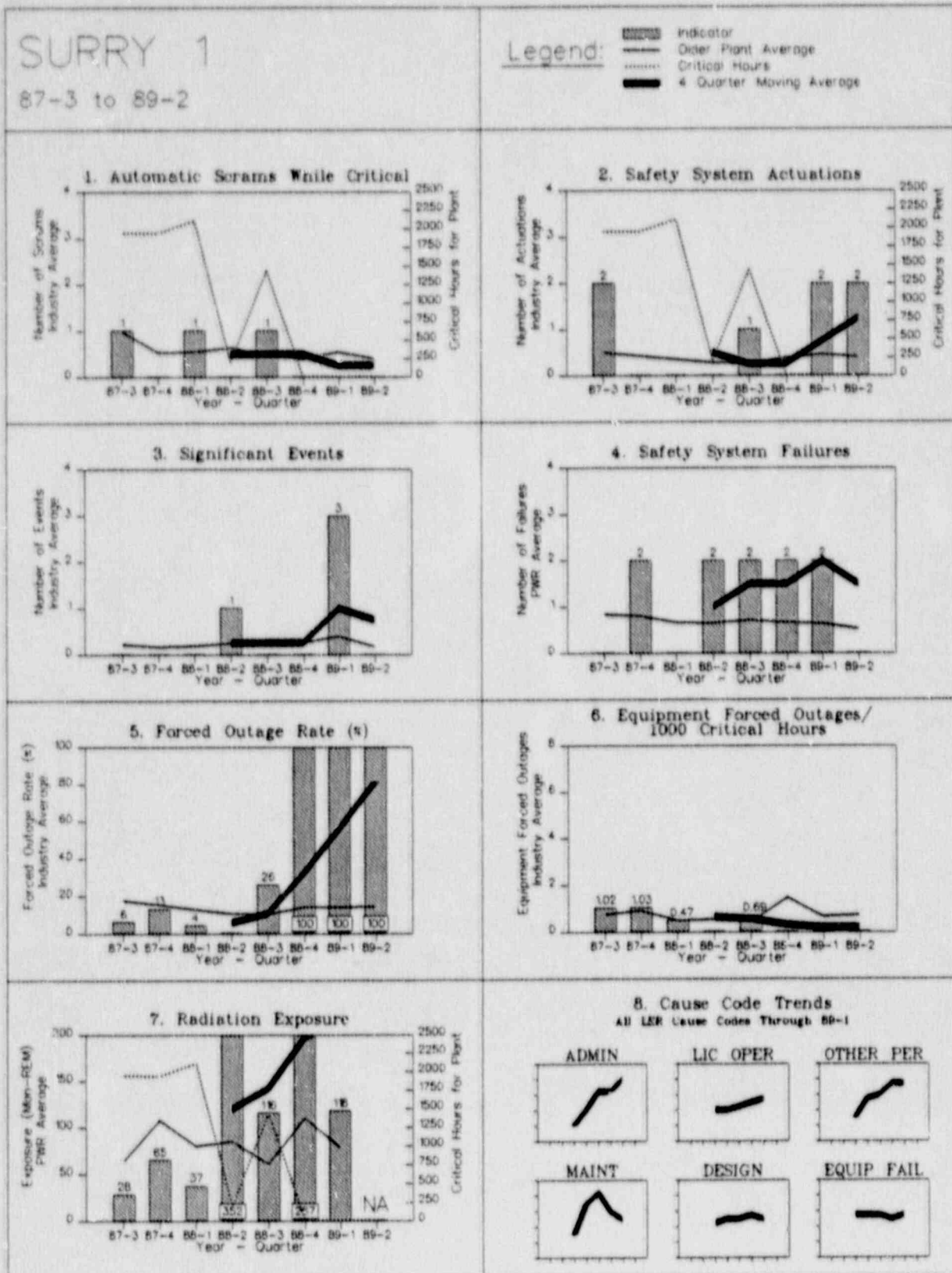


FIGURE 4.97

SURRY 1

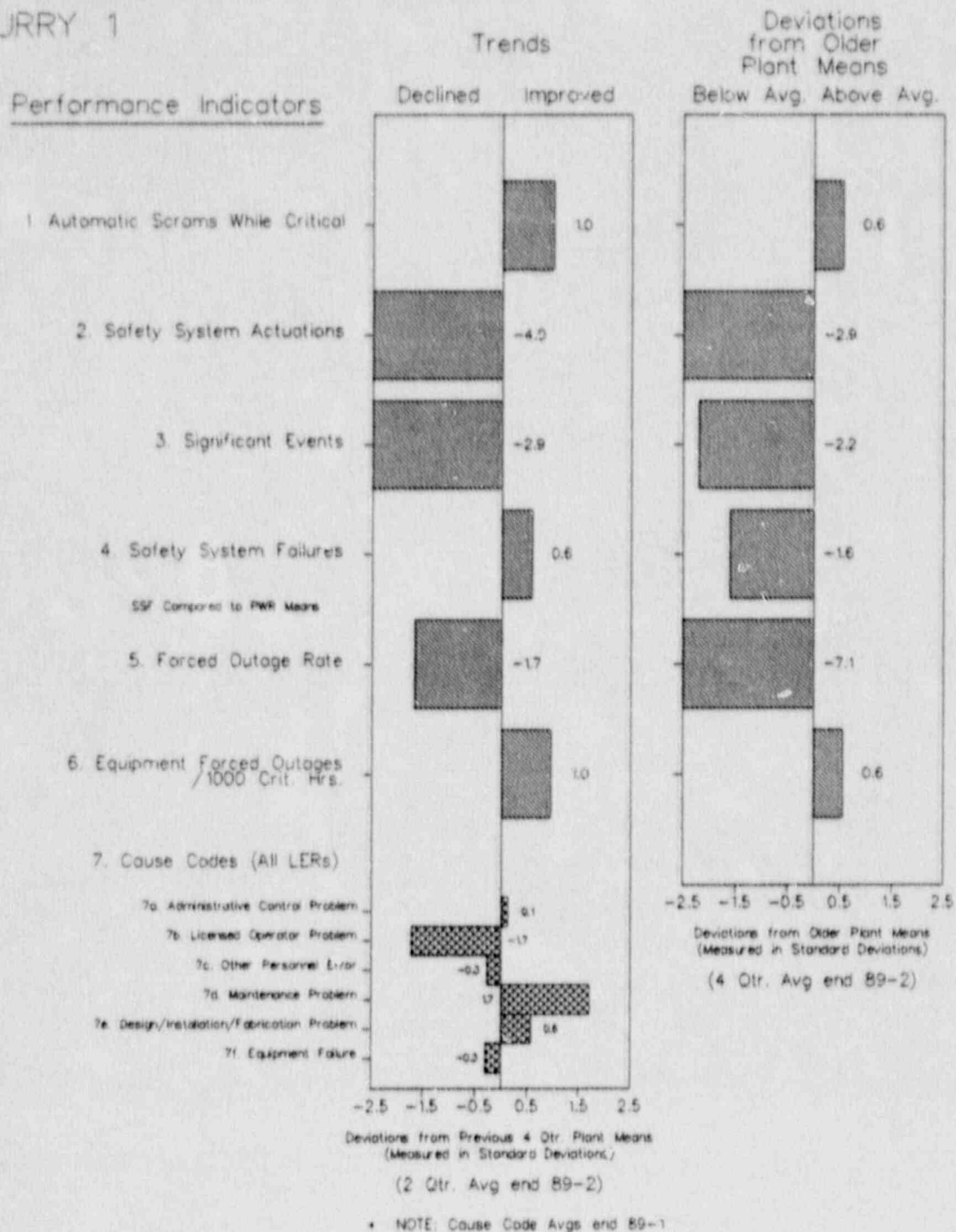


FIGURE 4.9B

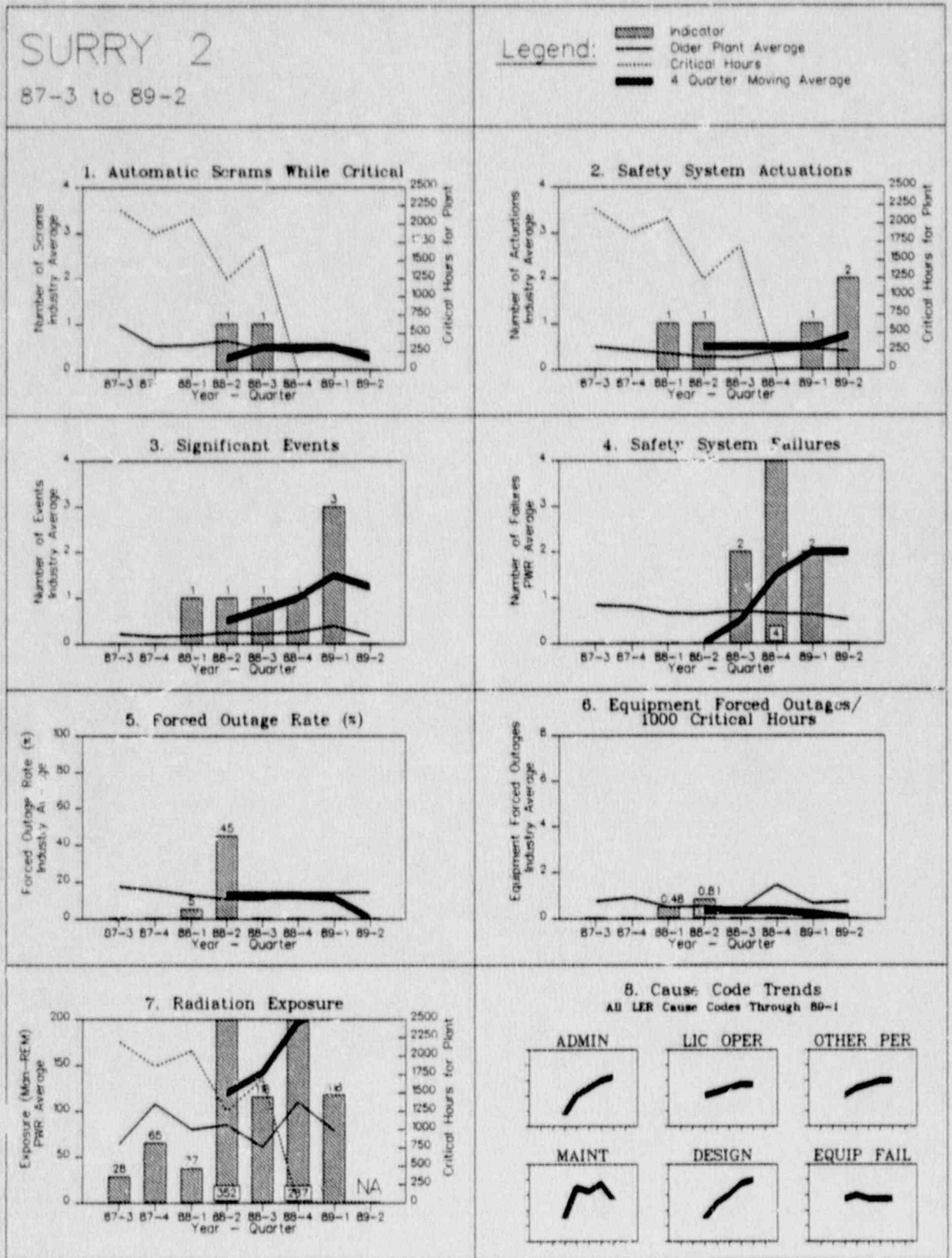




FIGURE 4.98

SURRY 2

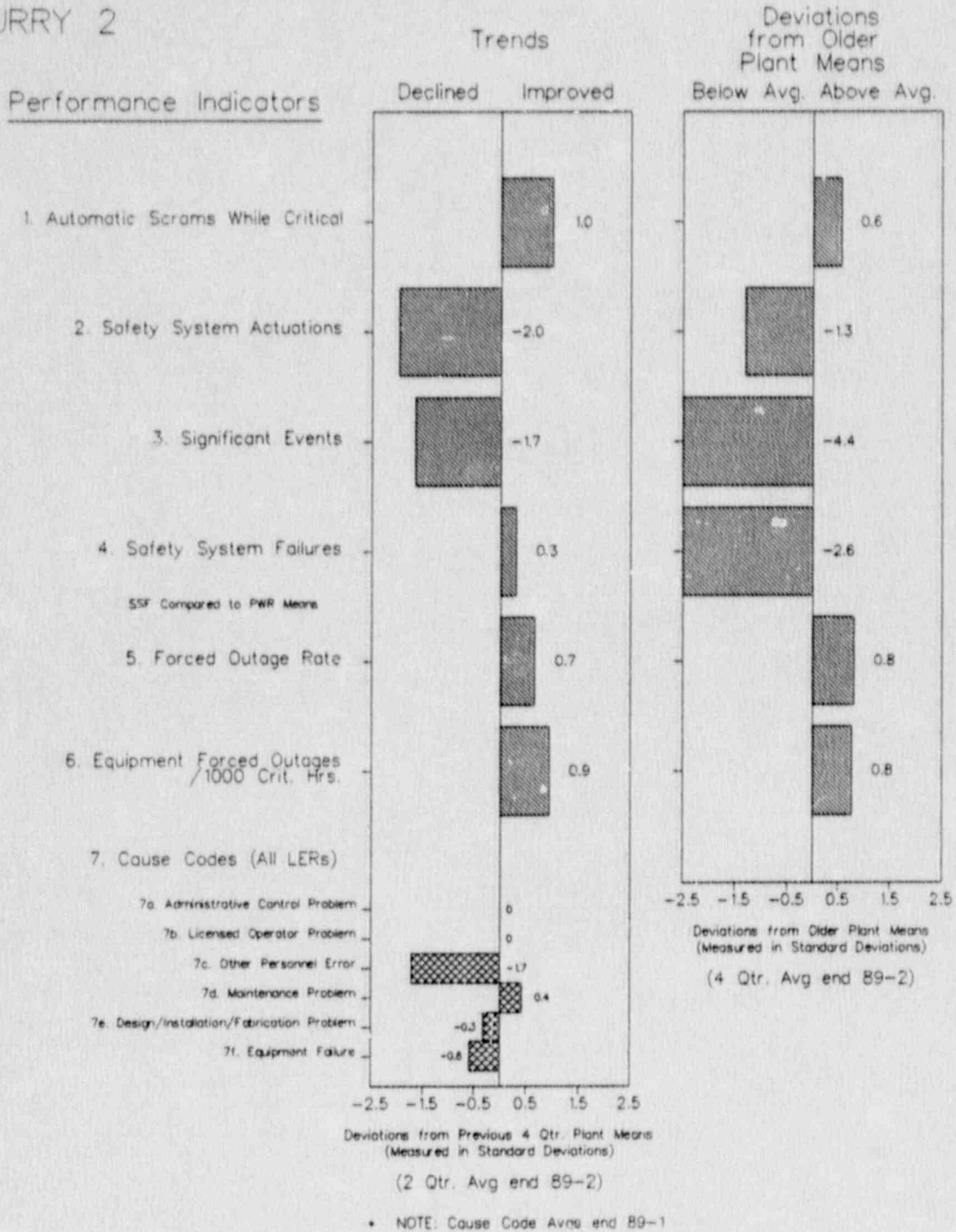


FIGURE 4.99

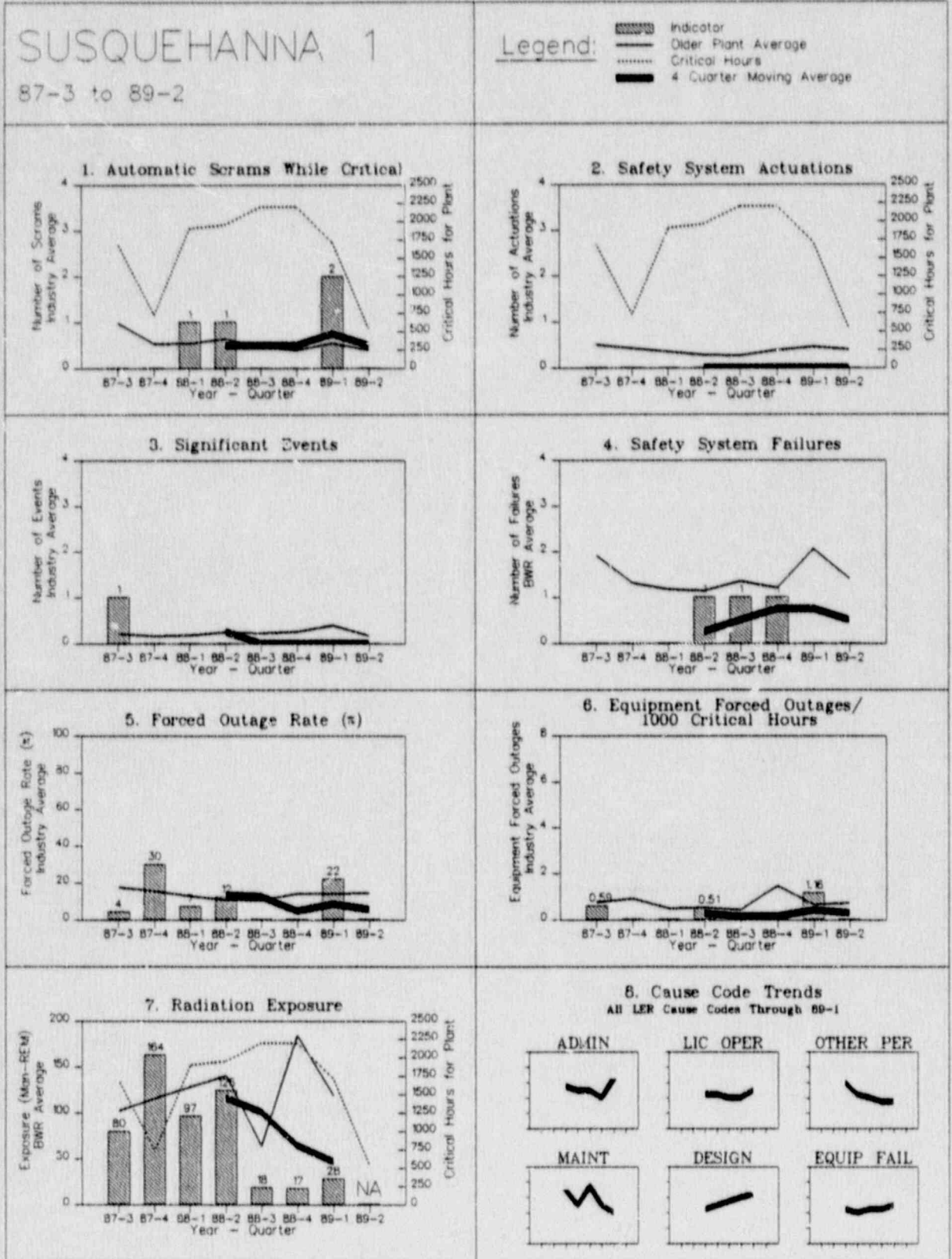


FIGURE 4.99

SUSQUEHANNA 1

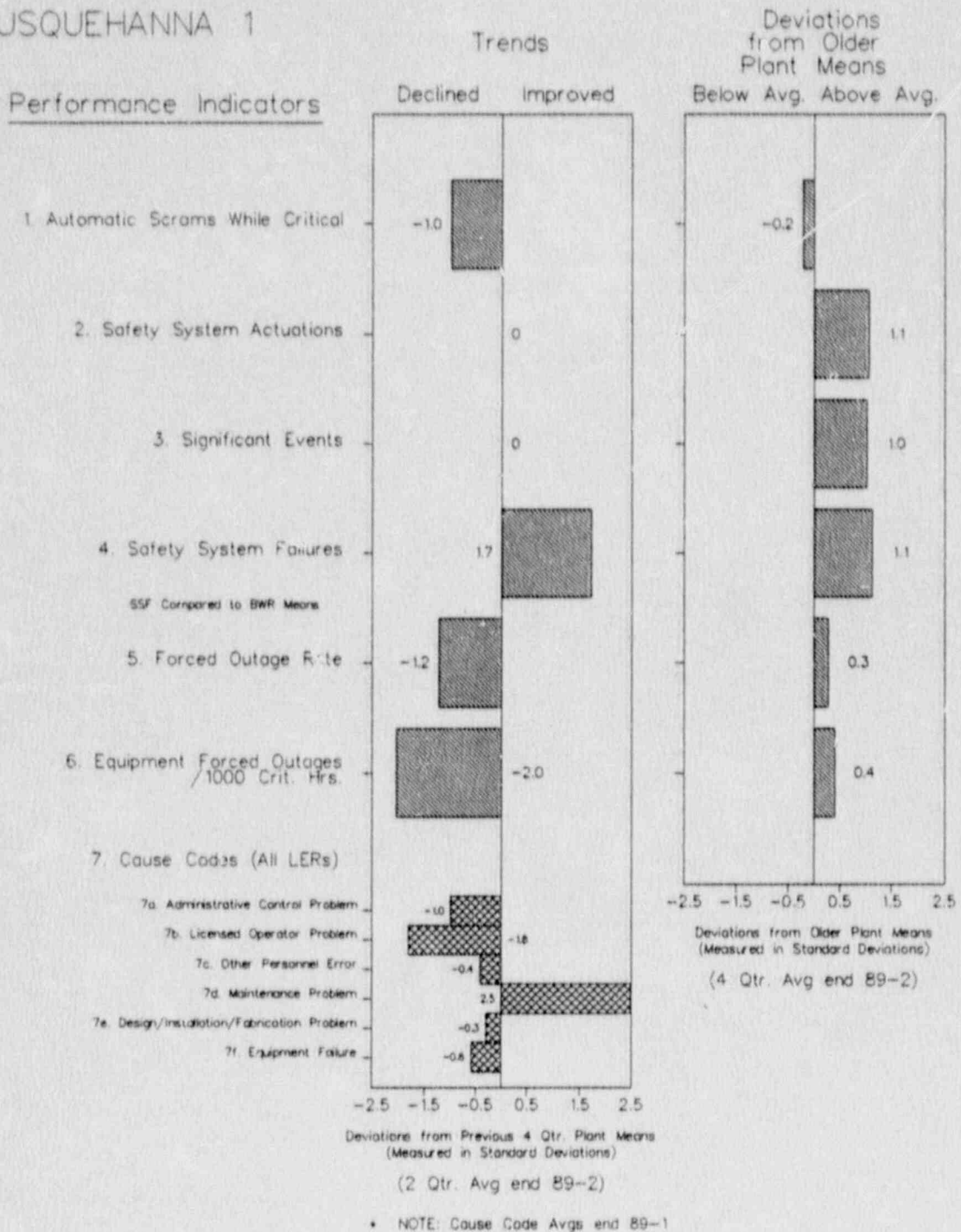


FIGURE 4.100

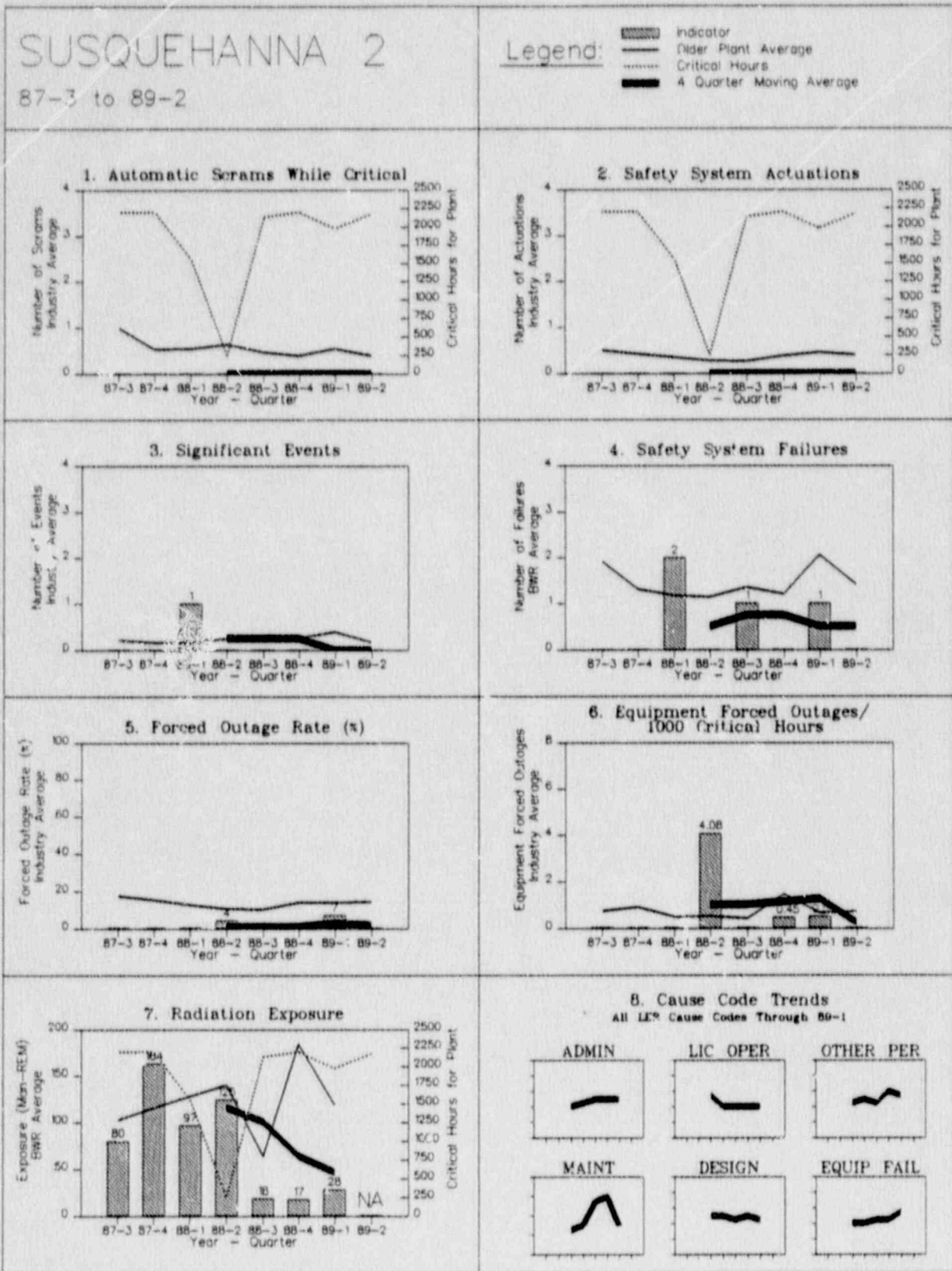


FIGURE 4.100

SUSQUEHANNA 2

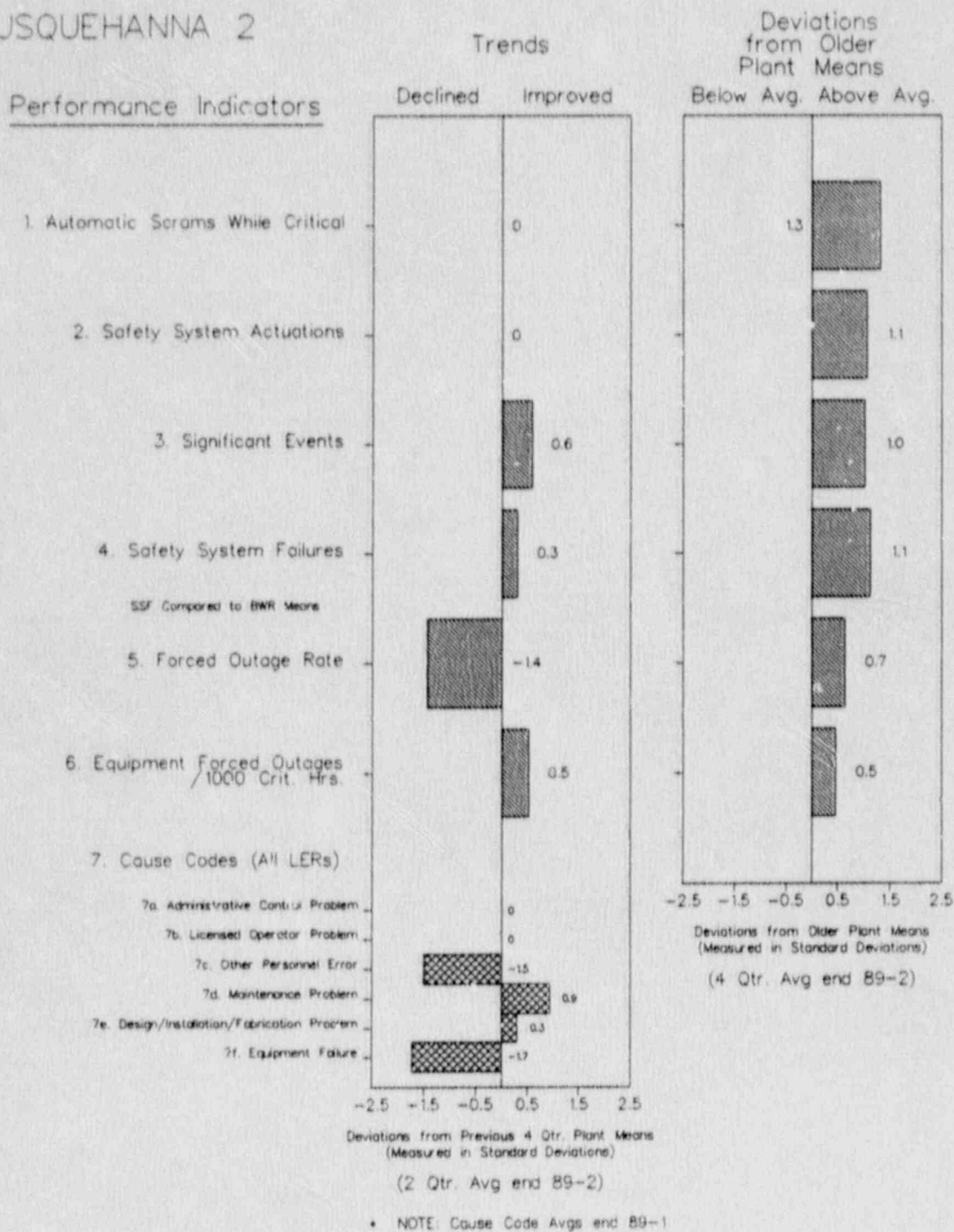


FIGURE 4.101

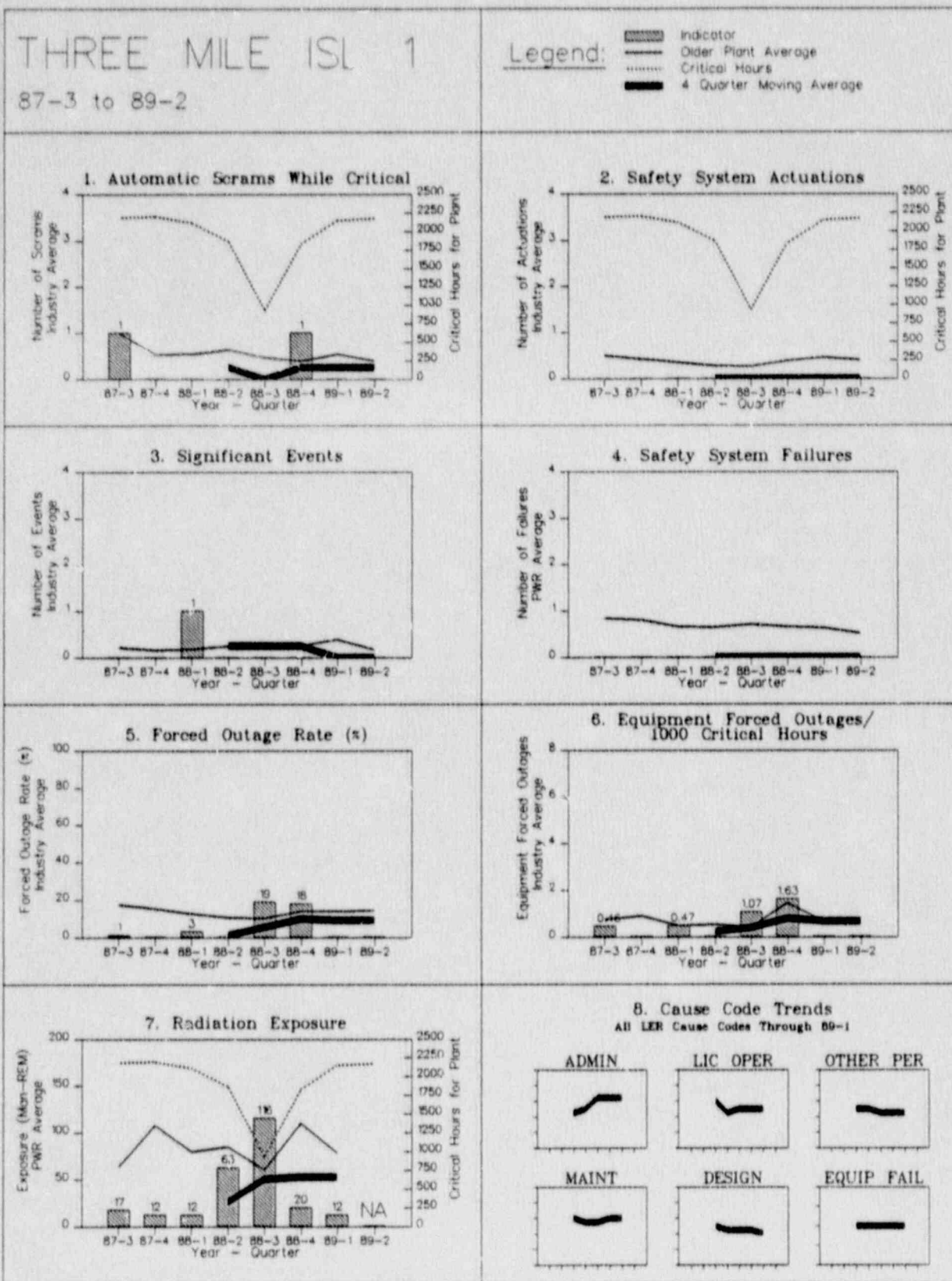


FIGURE 4.101

# THREE MILE ISL 1

## Performance Indicators

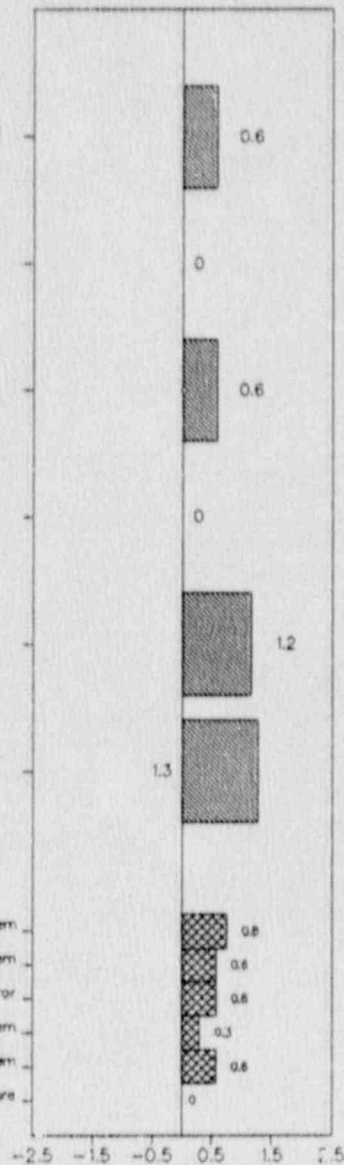
### Trends

Declined Improved

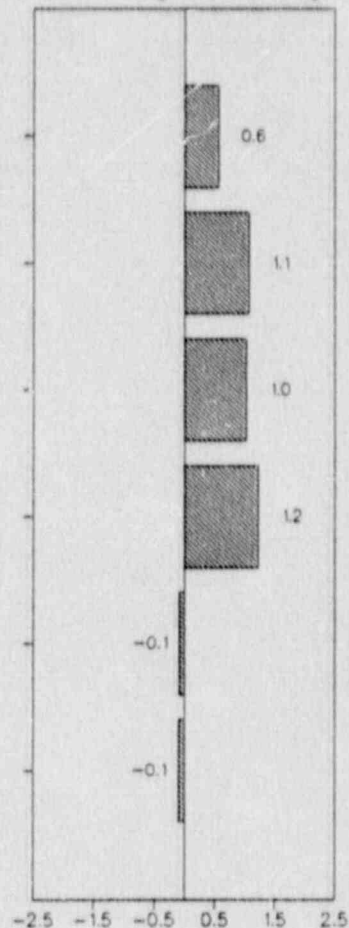
### Deviations from Older Plant Means

Below Avg. Above Avg.

- 1. Automatic Scrams While Critical
- 2. Safety System Actuations
- 3. Significant Events
- 4. Safety System Failures
- SSF Compared to PWR Means
- 5. Forced Outage Rate
- 6. Equipment Forced Outages / 1000 Crit. Hrs.
- 7. Cause Codes (All LERs)
  - 7a. Administrative Control Problem
  - 7b. Licensed Operator Problem
  - 7c. Other Personnel Error
  - 7d. Maintenance Problem
  - 7e. Design/Installation/Fabrication Problem
  - 7f. Equipment Failure



Deviations from Previous 4 Qtr. Plant Means  
(Measured in Standard Deviations)  
(2 Qtr. Avg end 89-2)



Deviations from Older Plant Means  
(Measured in Standard Deviations)  
(4 Qtr. Avg end 89-2)

\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.102

# TROJAN

87-3 to 89-2

**Legend:**  
 ■ Indicator  
 — Older Plant Average  
 ..... Critical Hours  
 — 4 Quarter Moving Average

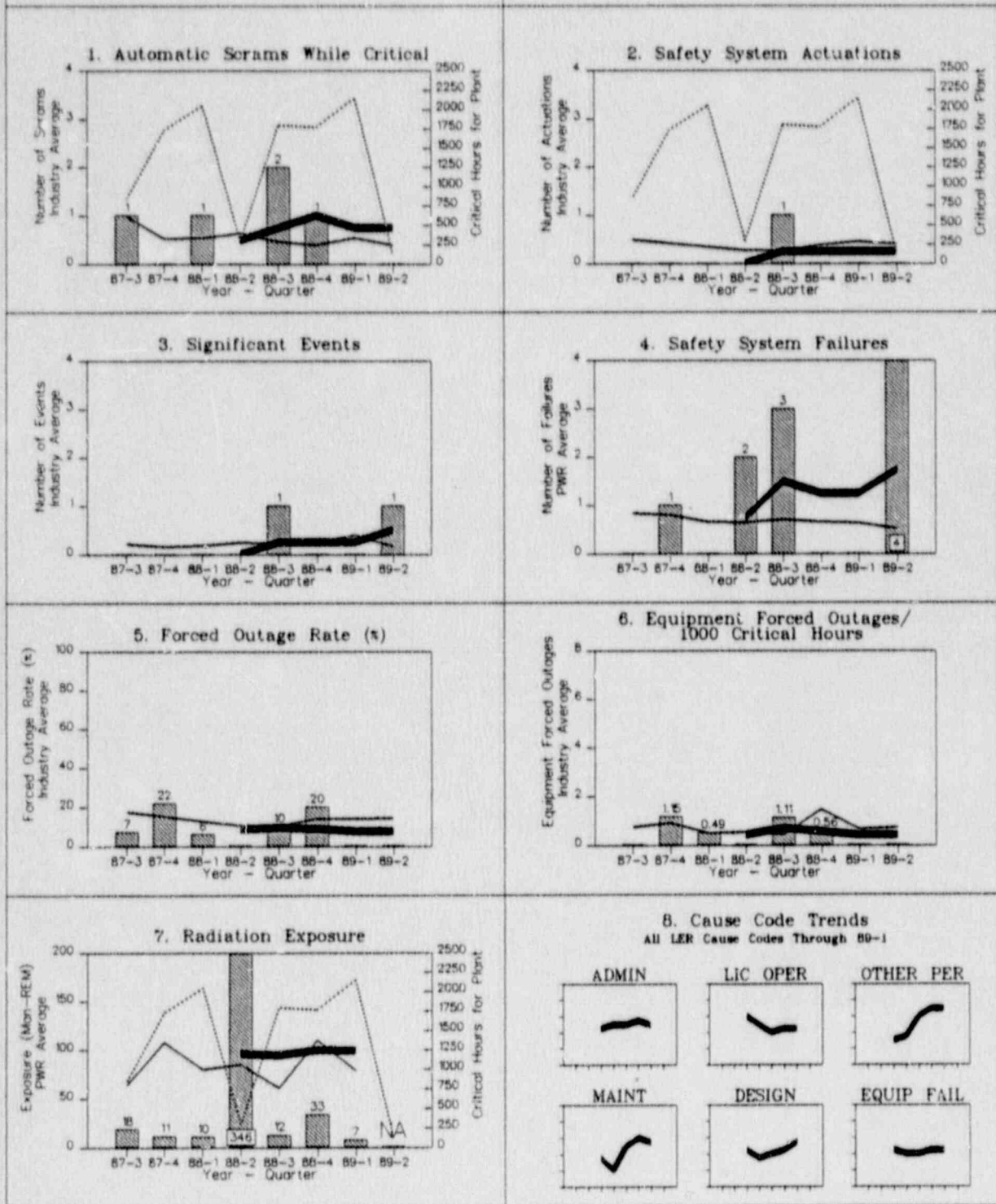




FIGURE 4.102

TROJAN

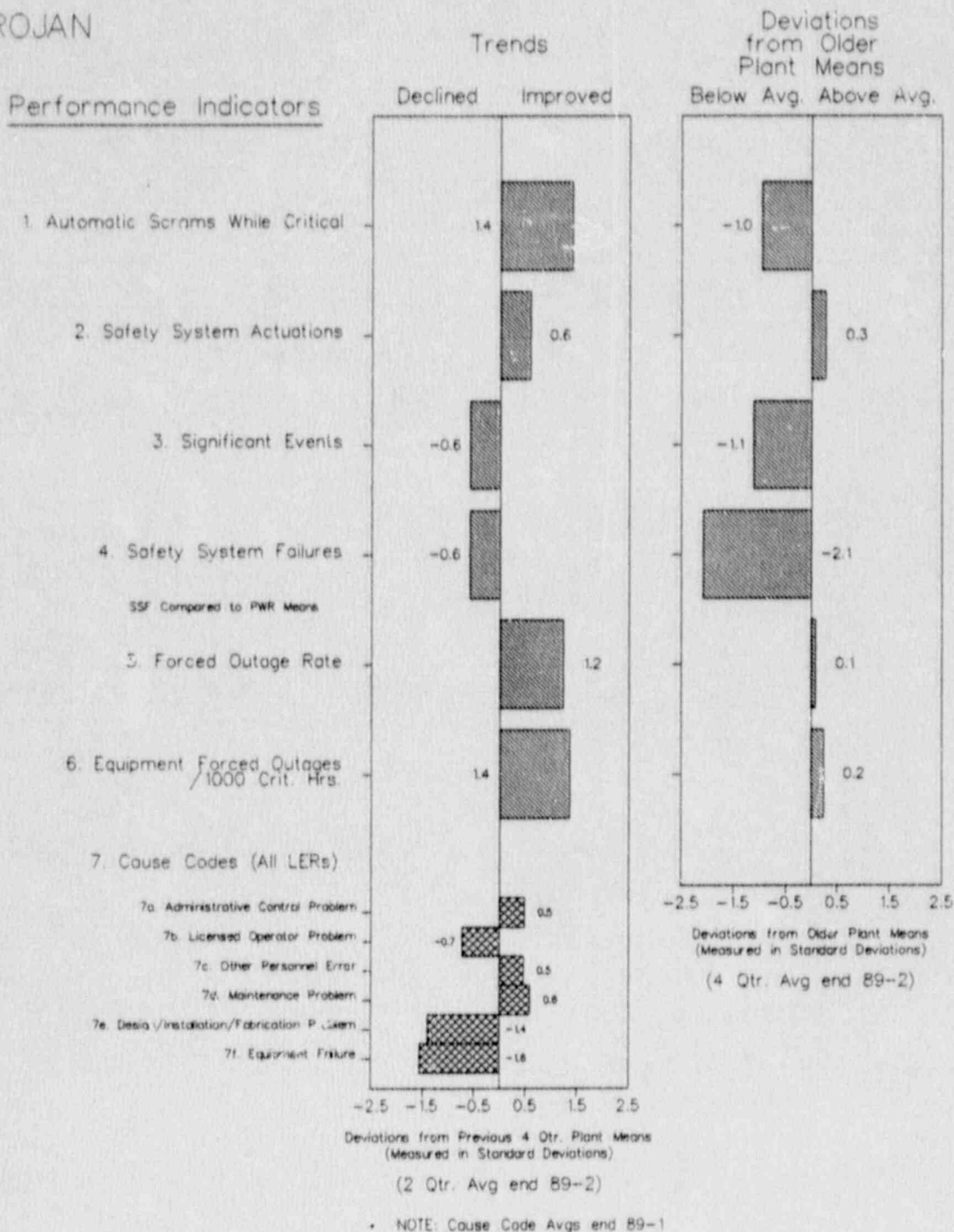


FIGURE 4.103

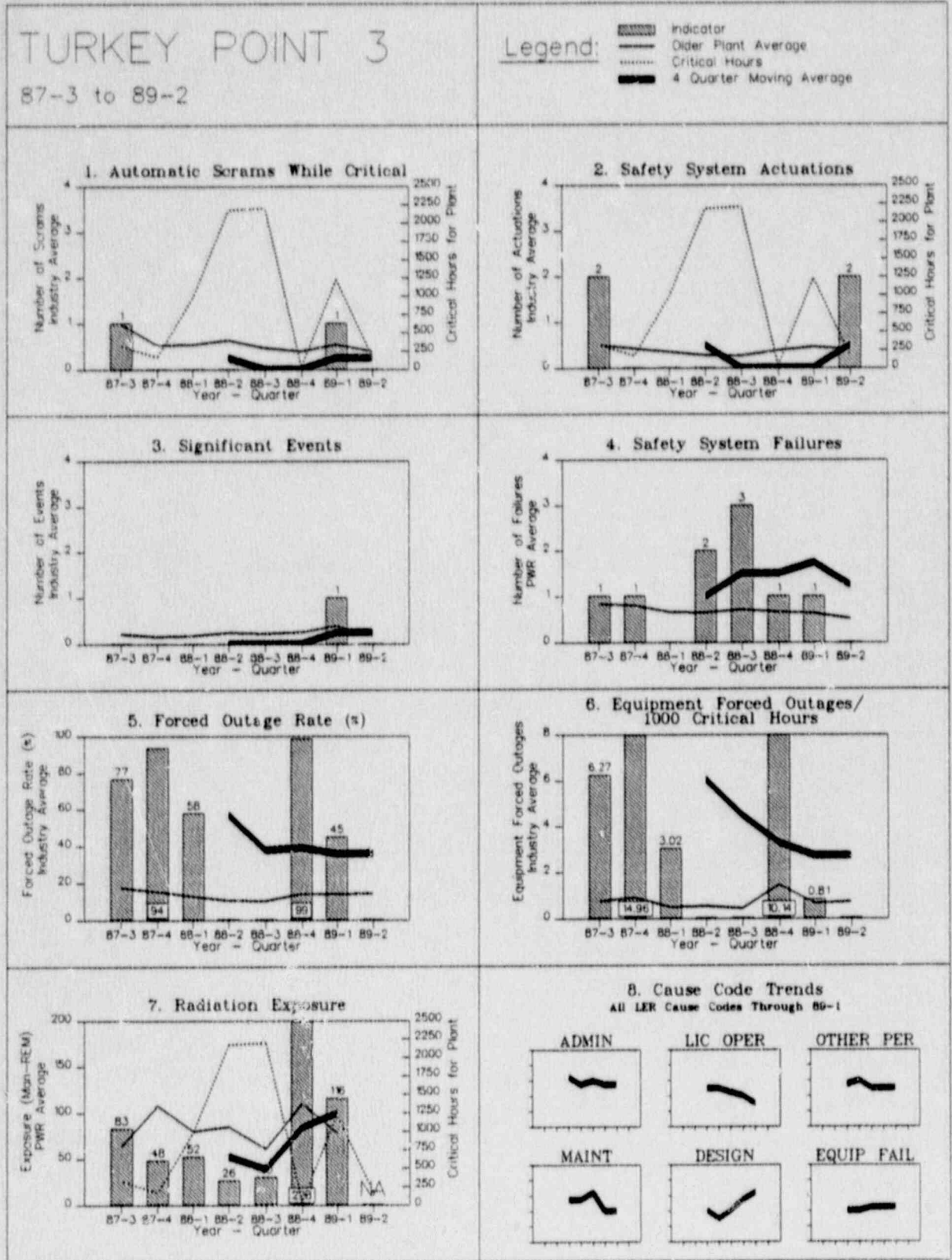


FIGURE 4.103

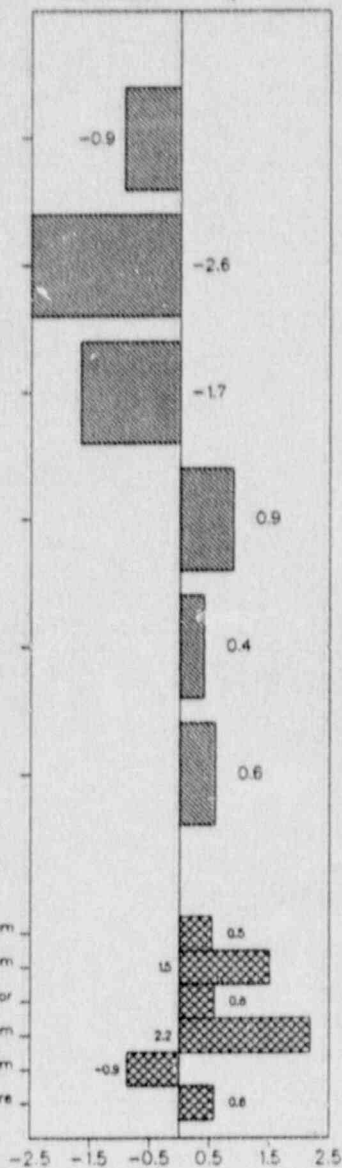
# TURKEY POINT 3

## Performance Indicators

- 1. Automatic Scrams While Critical
- 2. Safety System Actuations
- 3. Significant Events
- 4. Safety System Failures
- SSF Compared to PWR Means
- 5. Forced Outage Rate
- 6. Equipment Forced Outages / 1000 Crit. Hrs.
- 7. Cause Codes (All LERs)
  - 7a. Administrative Control Problem
  - 7b. Licensed Operator Problem
  - 7c. Other Personnel Error
  - 7d. Maintenance Problem
  - 7e. Design/Installation/Fabrication Problem
  - 7f. Equipment Failure

## Trends

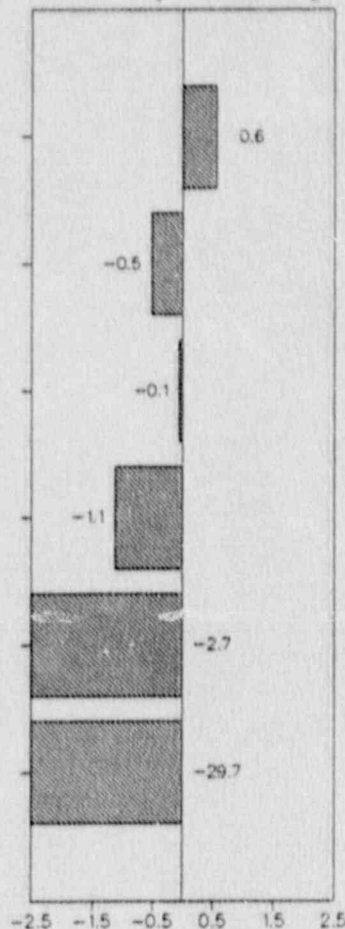
Declined Improved



Deviations from Previous 4 Qtr. Plant Means  
(Measured in Standard Deviations)  
(2 Qtr. Avg end 89-2)

## Deviations from Older Plant Means

Below Avg. Above Avg.



Deviations from Older Plant Means  
(Measured in Standard Deviations)  
(4 Qtr. Avg end 89-2)

\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.104

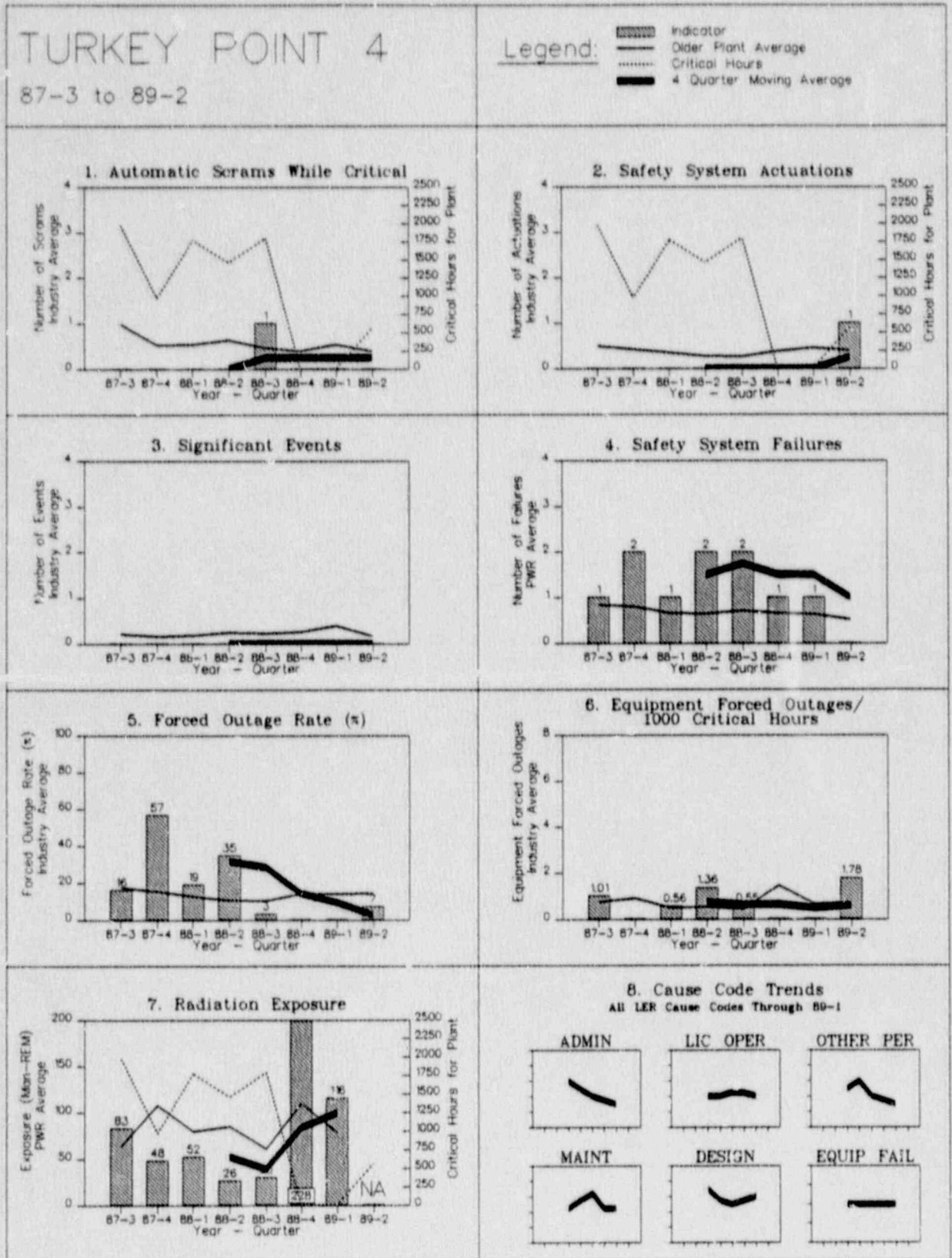


FIGURE 4.104

TURKEY POINT 4

Performance Indicators

Trends

Declined Improved

Deviations from Older Plant Means

Below Avg. Above Avg.

1. Automatic Scrams While Critical

0.6

0.6

2. Safety System Actuations

-1.3

0.3

3. Significant Events

0

1.0

4. Safety System Failures

SSF Compared to PWR Means

2.0

-0.7

5. Forced Outage Rate

0.8

0.6

6. Equipment Forced Outages / 1000 Crit. Hrs.

-0.6

0.0

7. Cause Codes (All LERs)

7a. Administrative Control Problem

1.0

7b. Licensed Operator Problem

0.8

7c. Other Personnel Error

0.8

7d. Maintenance Problem

1.8

7e. Design/Installation/Fabrication Problem

-0.8

7f. Equipment Failure

0

-2.5 -1.5 -0.5 0.5 1.5 2.5

Deviations from Previous 4 Qtr. Plant Means (Measured in Standard Deviations)

(2 Qtr. Avg end 89-2)

-2.5 -1.5 -0.5 0.5 1.5 2.5

Deviations from Older Plant Means (Measured in Standard Deviations)

(4 Qtr. Avg end 89-2)

\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.105

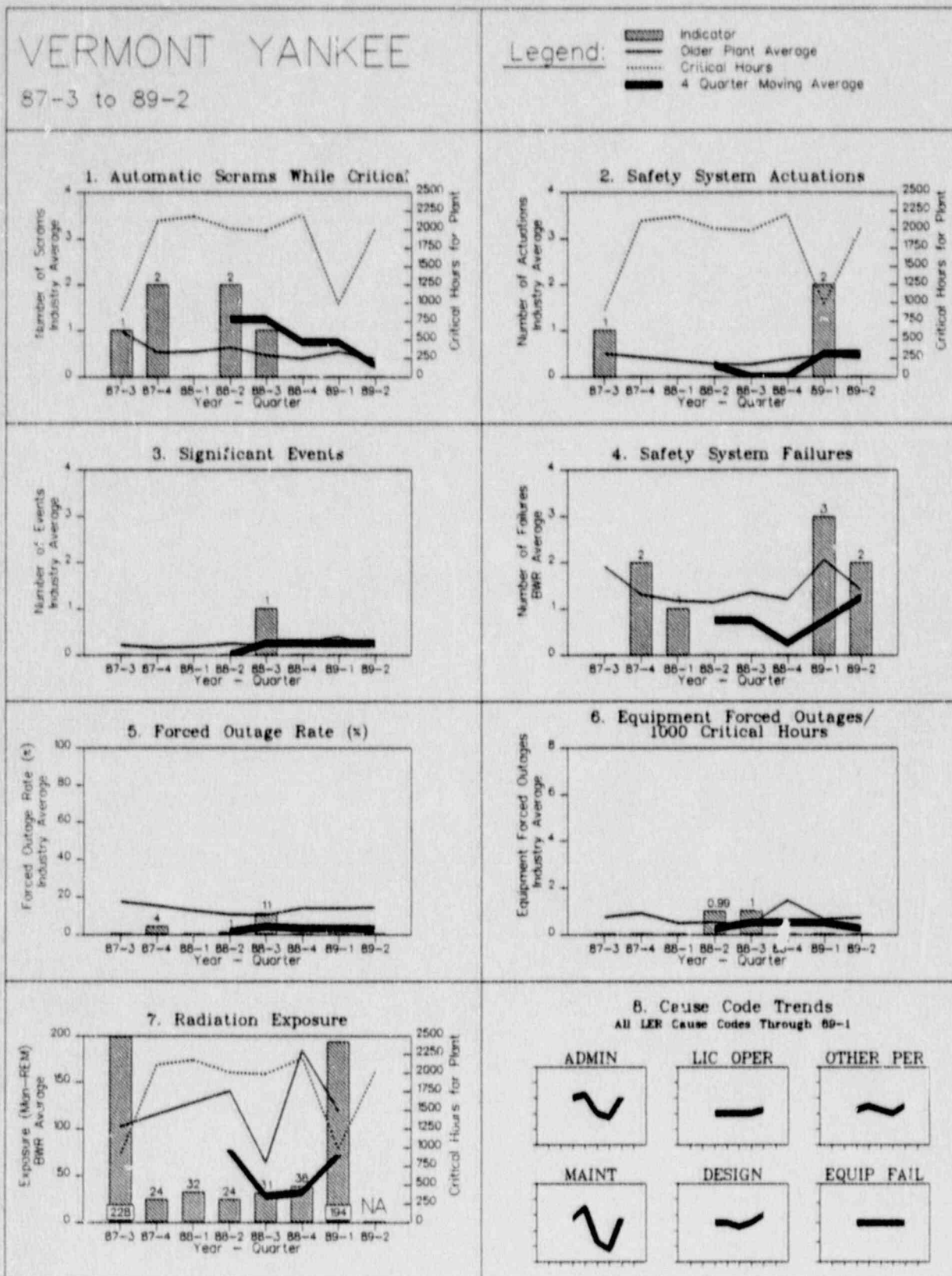


FIGURE 4.105

# VERMONT YANKEE

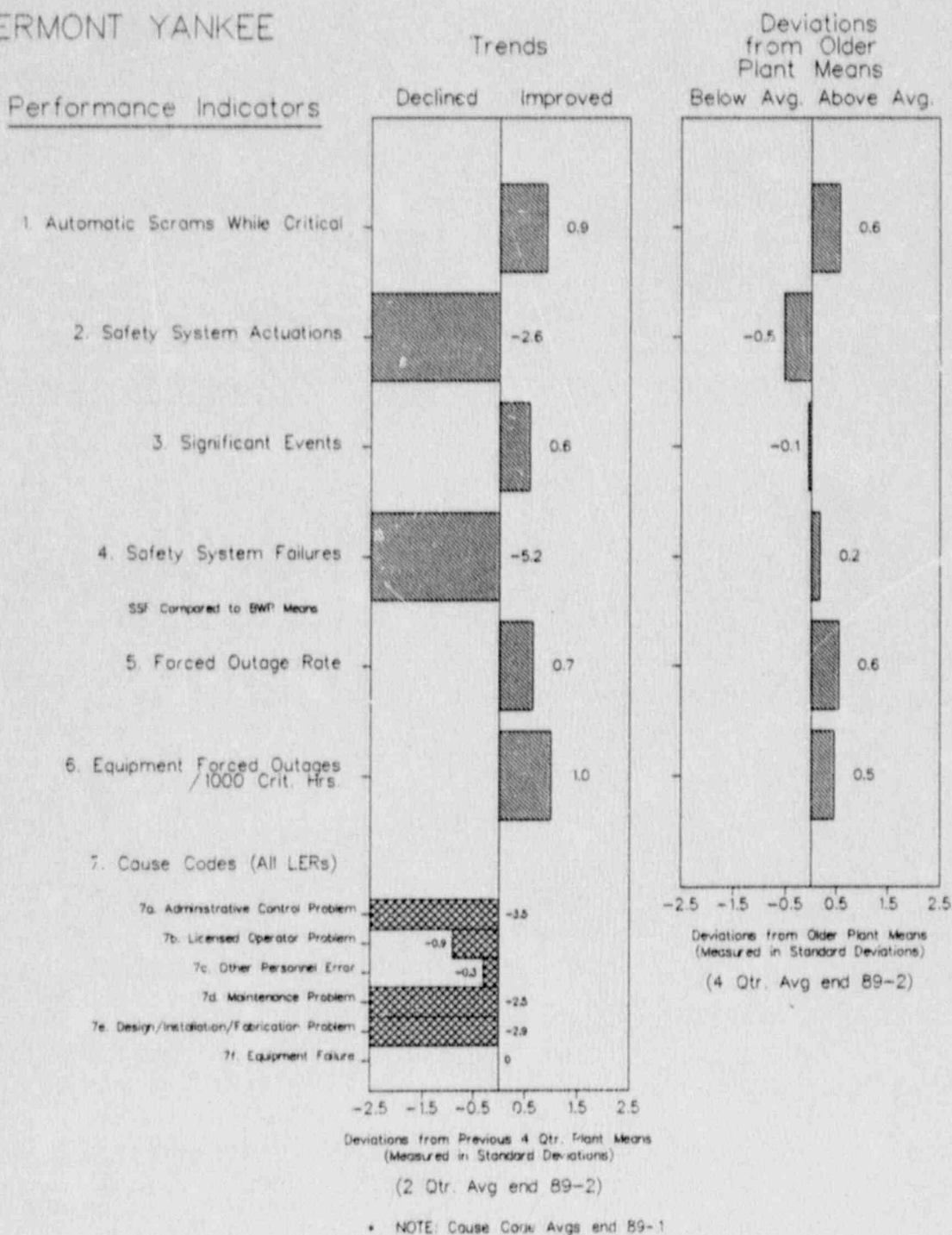


FIGURE 4.106

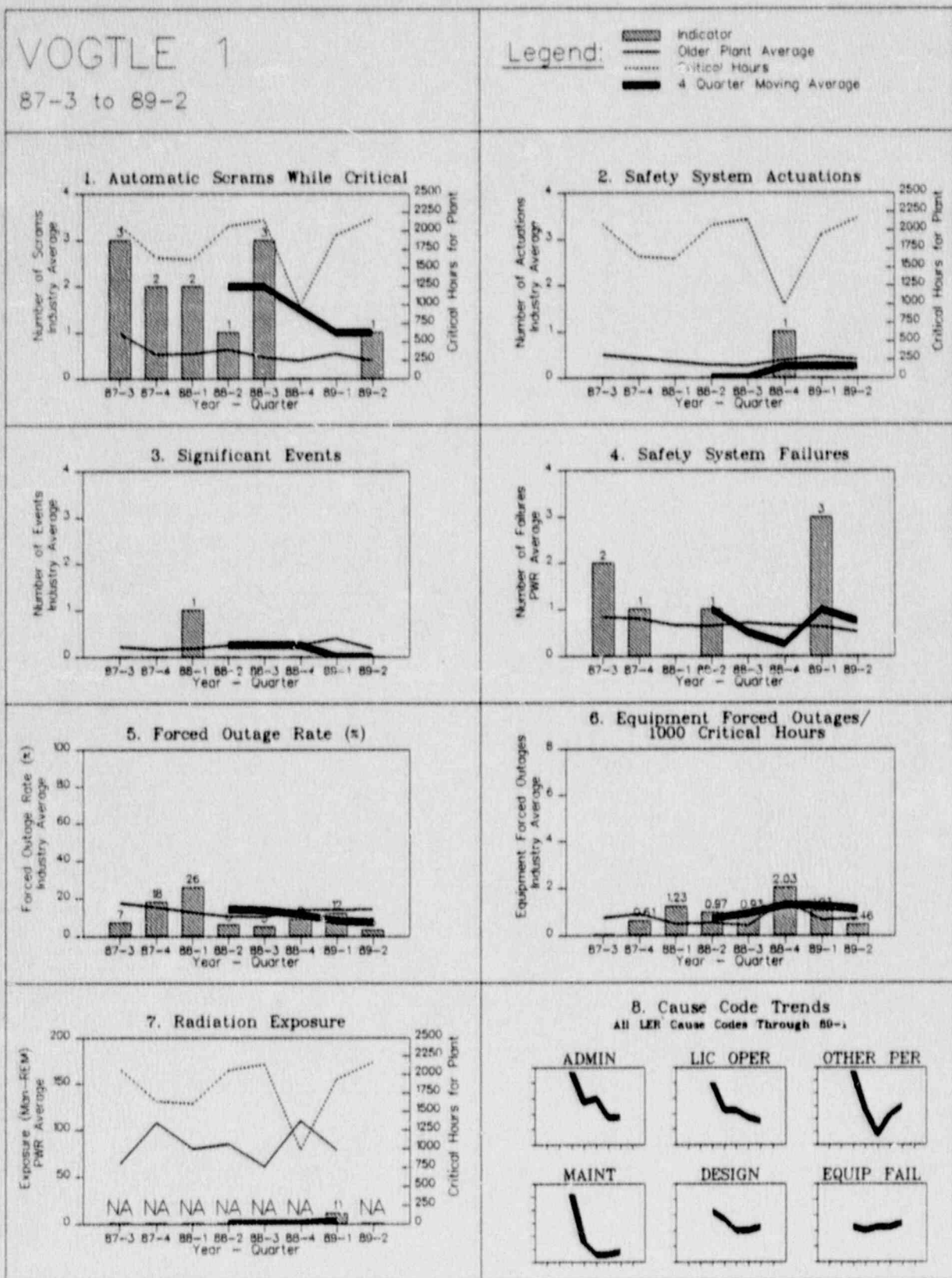
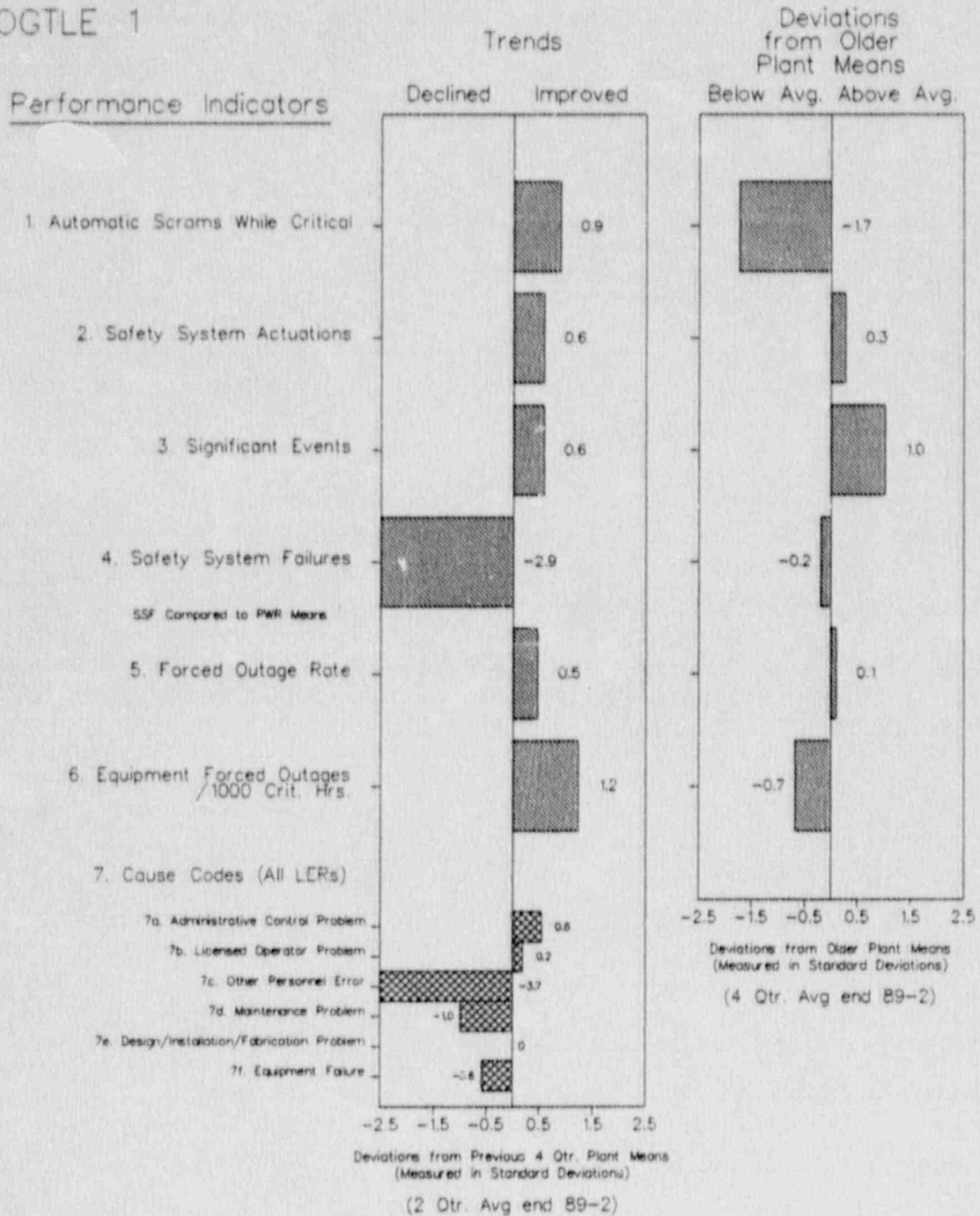




FIGURE 4.106

VOGTLE 1



\* NOTE: Cause Code Avgs end 89-1

FIGURE 4.107

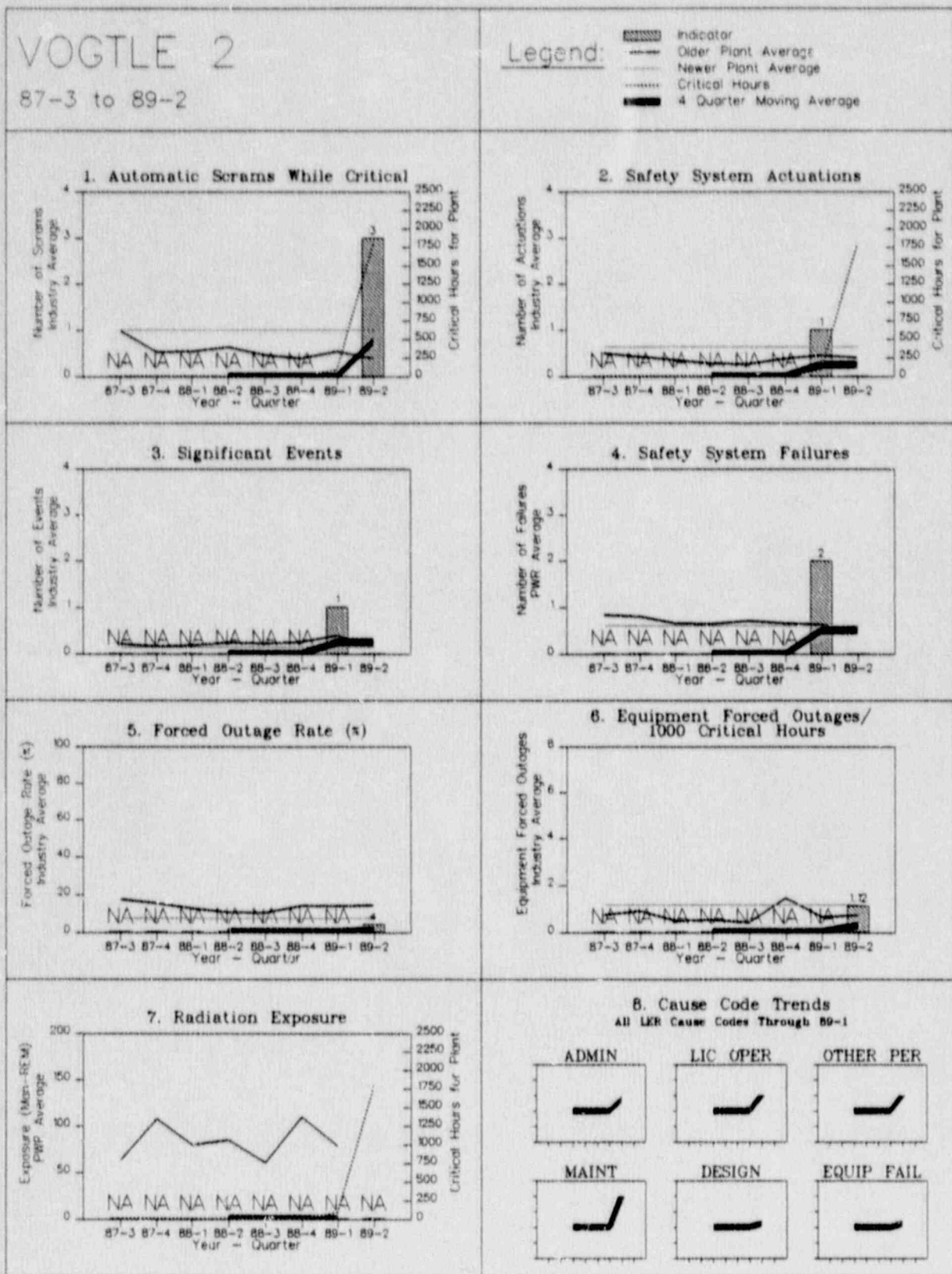
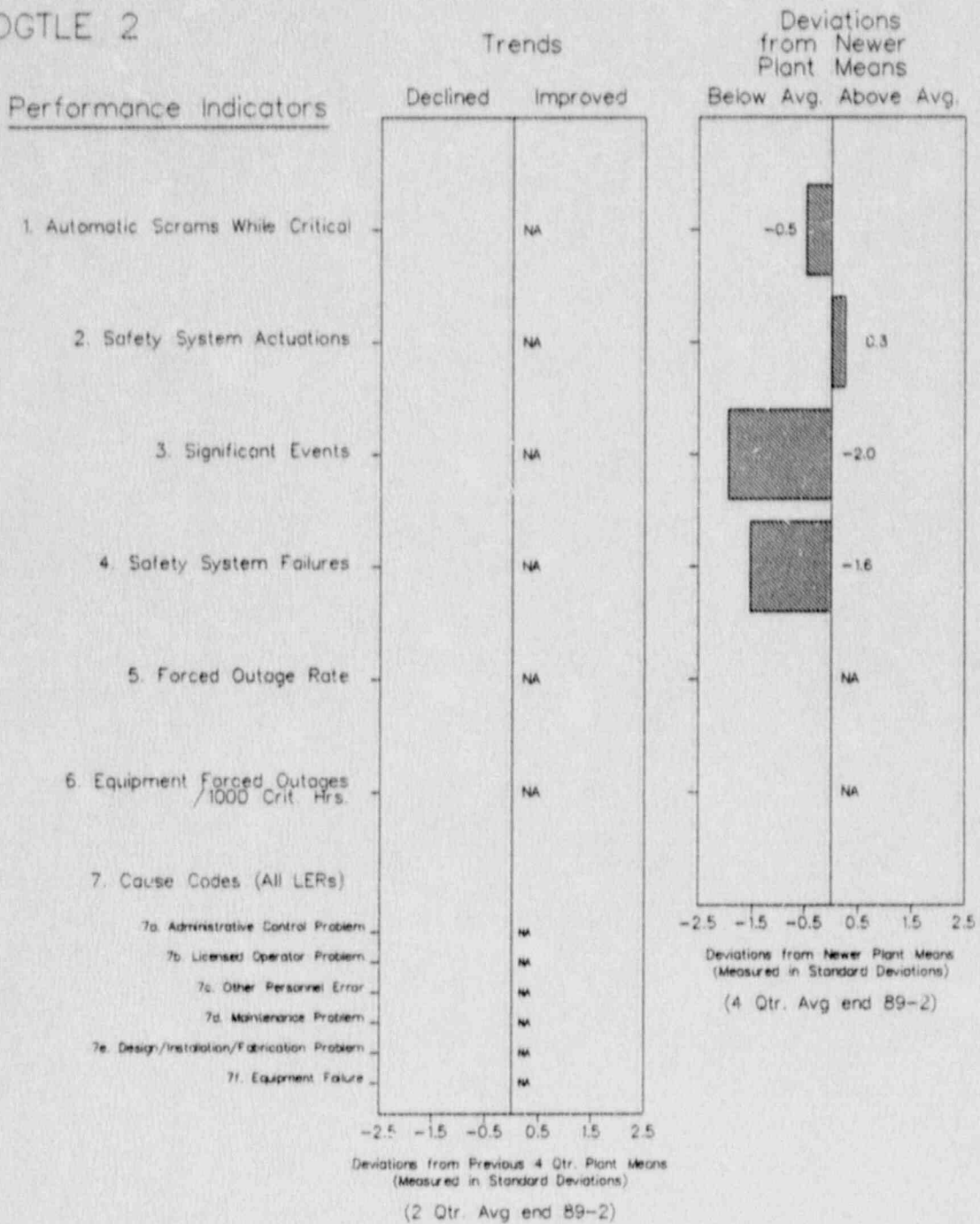


FIGURE 4.107

VOGTLE 2



\* NOTE: Cause Code Avgs end 89-1

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FIGURE 4.107

Note: This is a comparison of VOGTLE 2  
(a newer plant) against older plant means.

VOGTLE 2

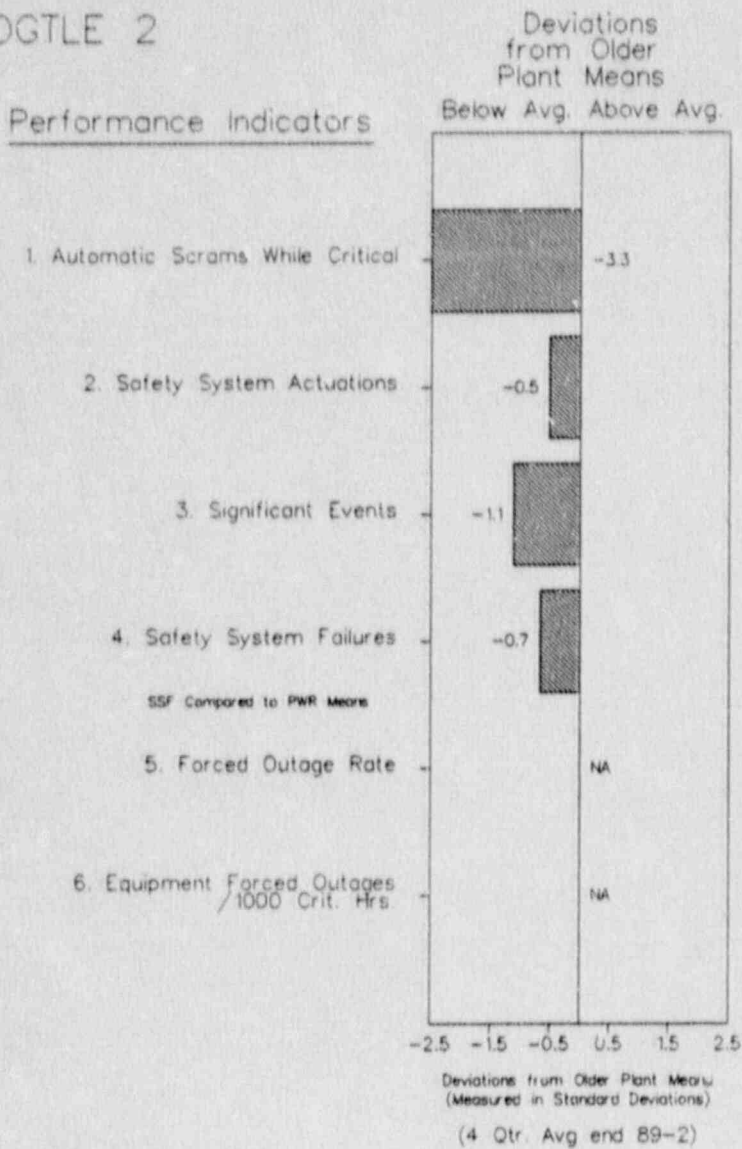


FIGURE 4.108

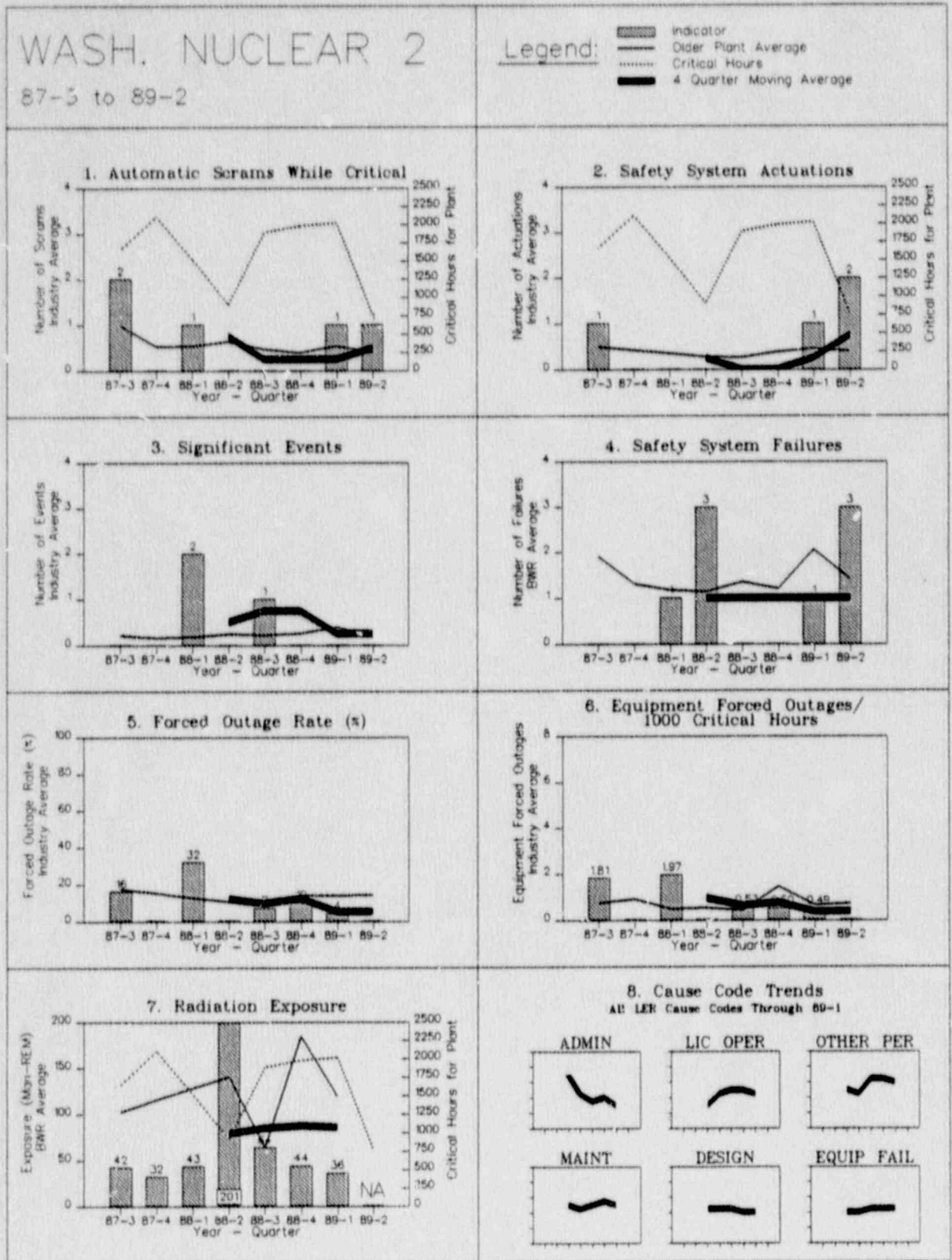


FIGURE 4.108

WASH. NUCLEAR 2

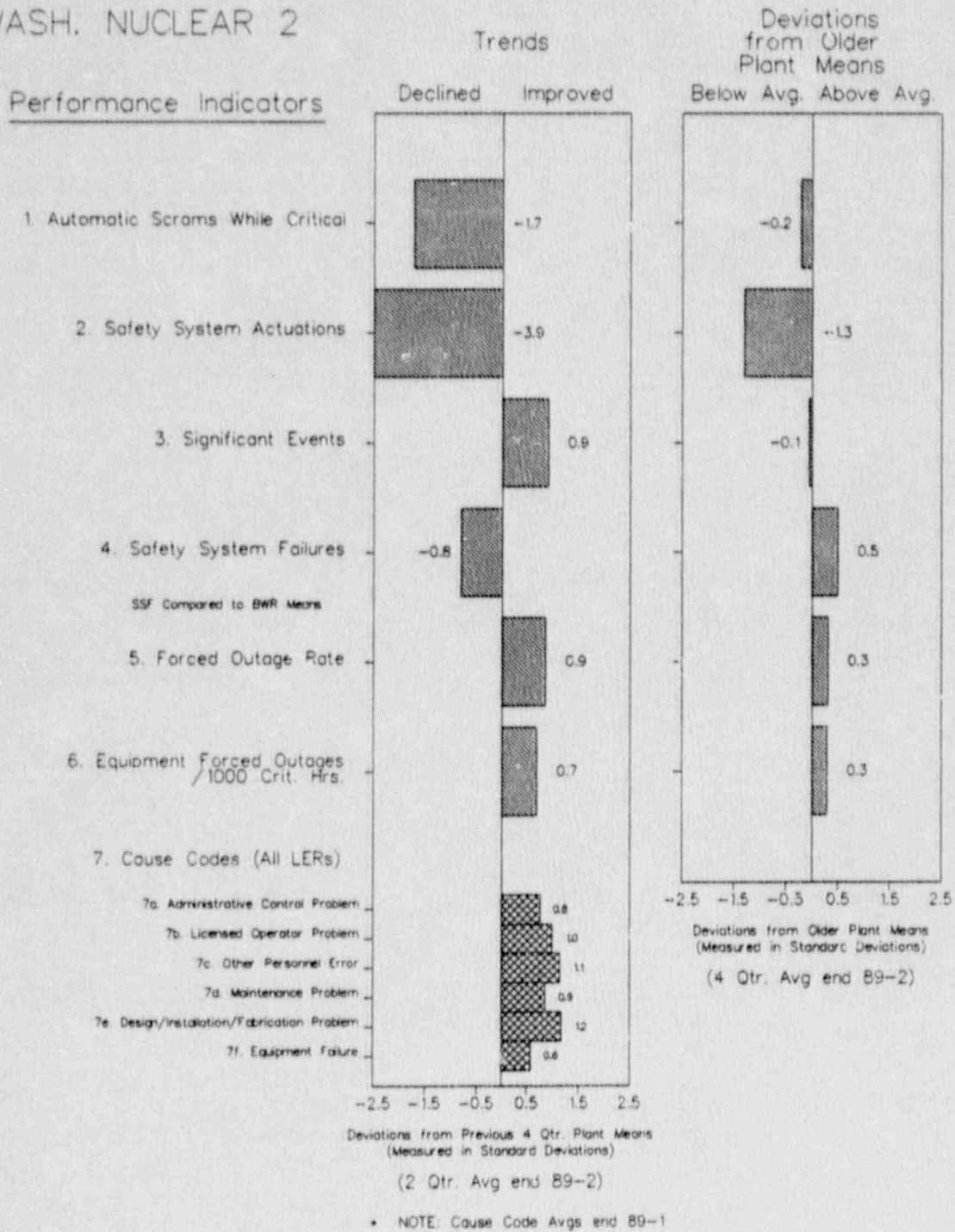


FIGURE 4.109

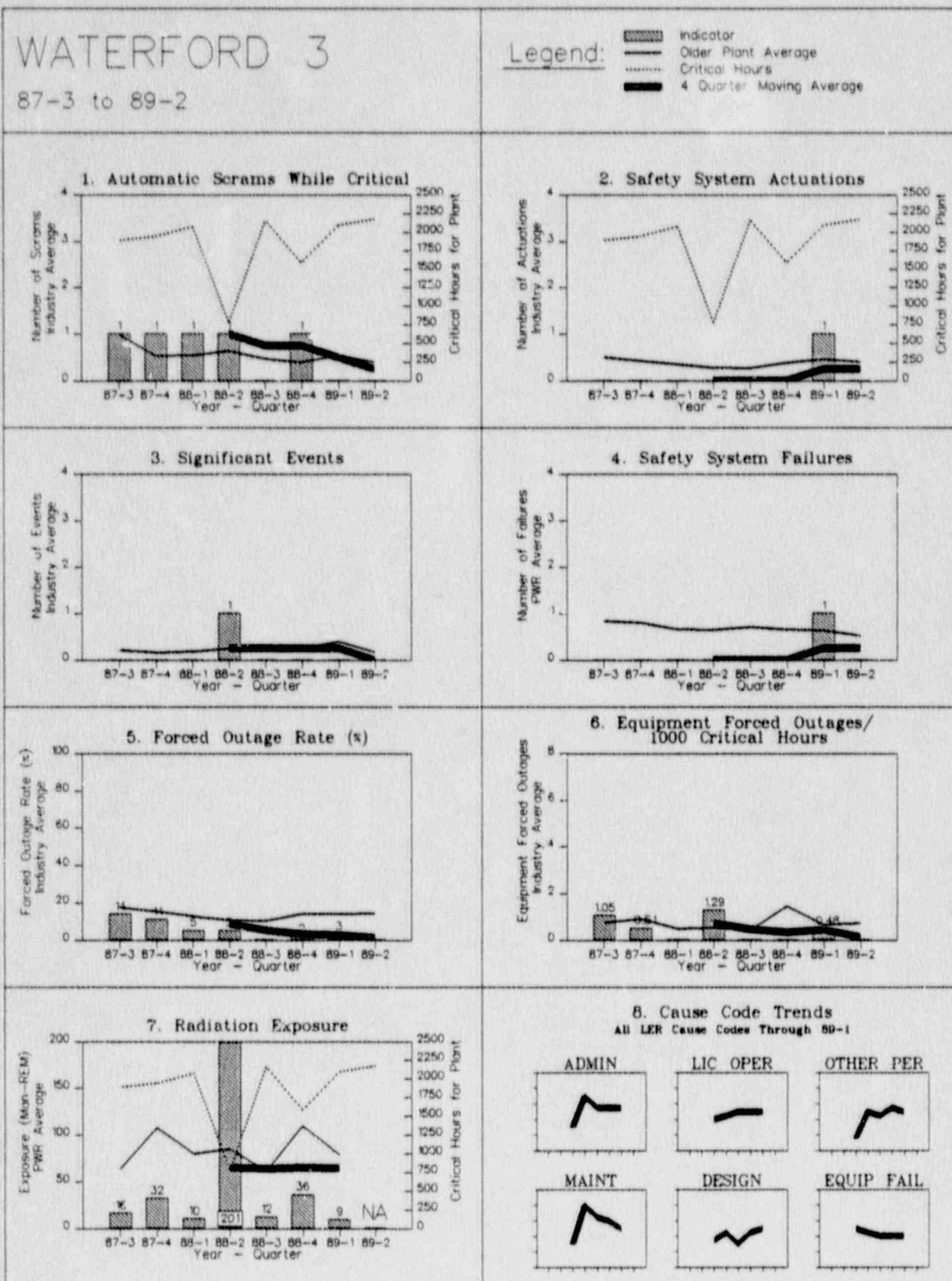




FIGURE 4.109

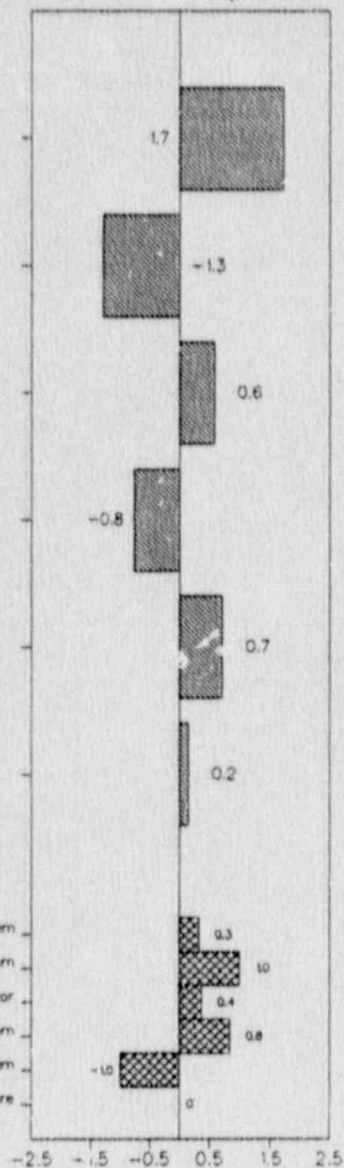
# WATERFORD 3

## Performance Indicators

- 1. Automatic Scrams While Critical
- 2. Safety System Actuations
- 3. Significant Events
- 4. Safety System Failures
- SSF Compared to PWR Means
- 5. Forced Outage Rate
- 6. Equipment Forced Outages / 1000 Crit. Hrs.
- 7. Cause Codes (All LERs)
  - 7a. Administrative Control Problem
  - 7b. Licensed Operator Problem
  - 7c. Other Personnel Error
  - 7d. Maintenance Problem
  - 7e. Design/Installation/Fabrication Problem
  - 7f. Equipment Failure

### Trends

Declined Improved



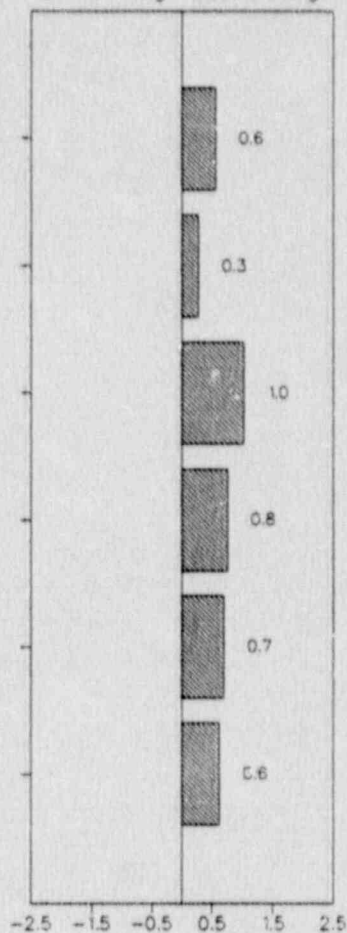
Deviations from Previous 4 Qtr. Plant Means  
(Measured in Standard Deviations)

(2 Qtr. Avg end 89-2)

\* NOTE: Cause Code avgs end 89-1

### Deviations from Older Plant Means

Below Avg. Above Avg.



Deviations from Older Plant Means  
(Measured in Standard Deviations)

(4 Qtr. Avg end 89-2)

FIGURE 4.110

# WOLF CREEK

87-3 to 89-2

Legend: Indicator  
 — Older Plant Average  
 ..... Critical Hours  
 — 4 Quarter Moving Average

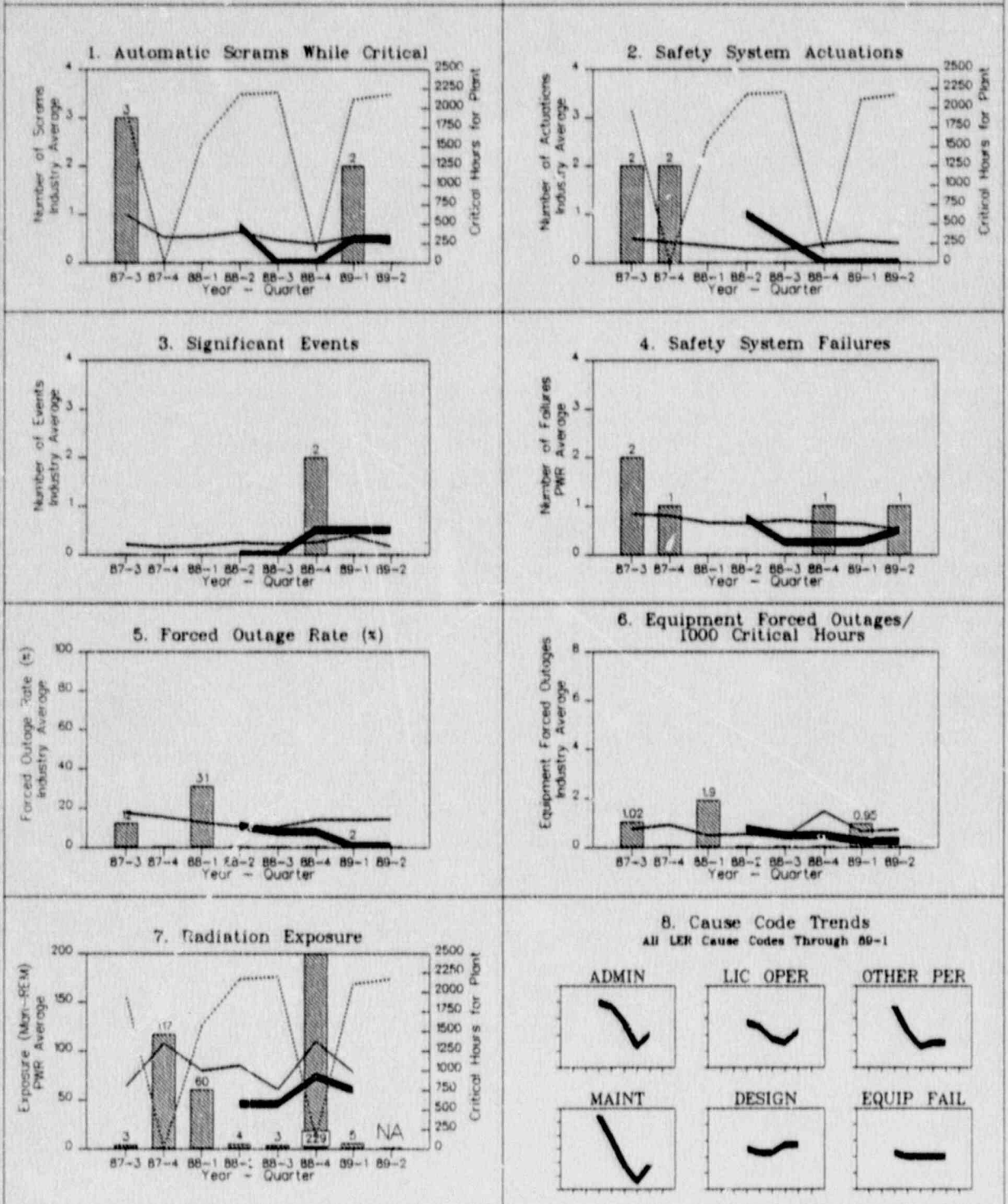


FIGURE 4.110

WOLF CREEK

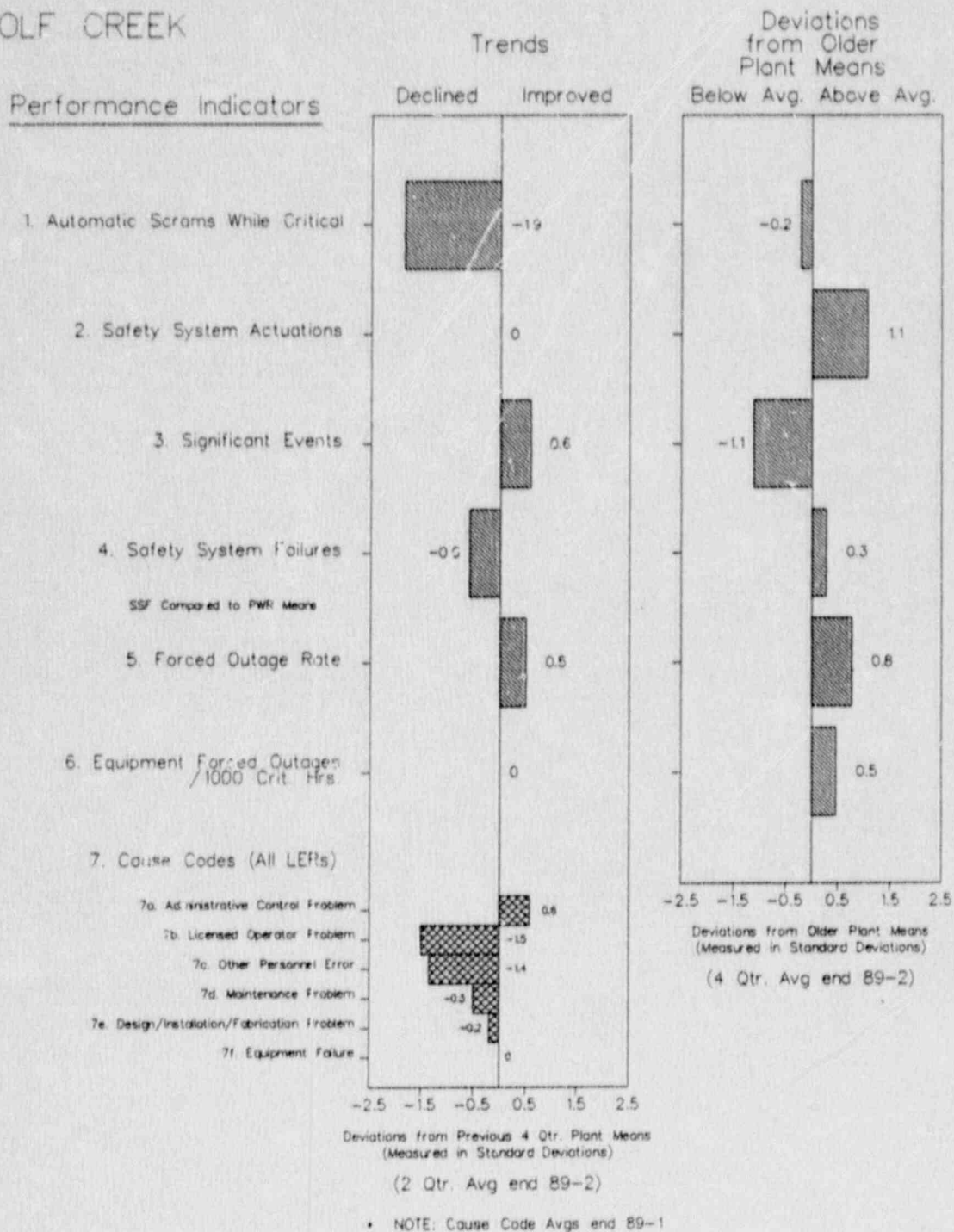


FIGURE 4.111

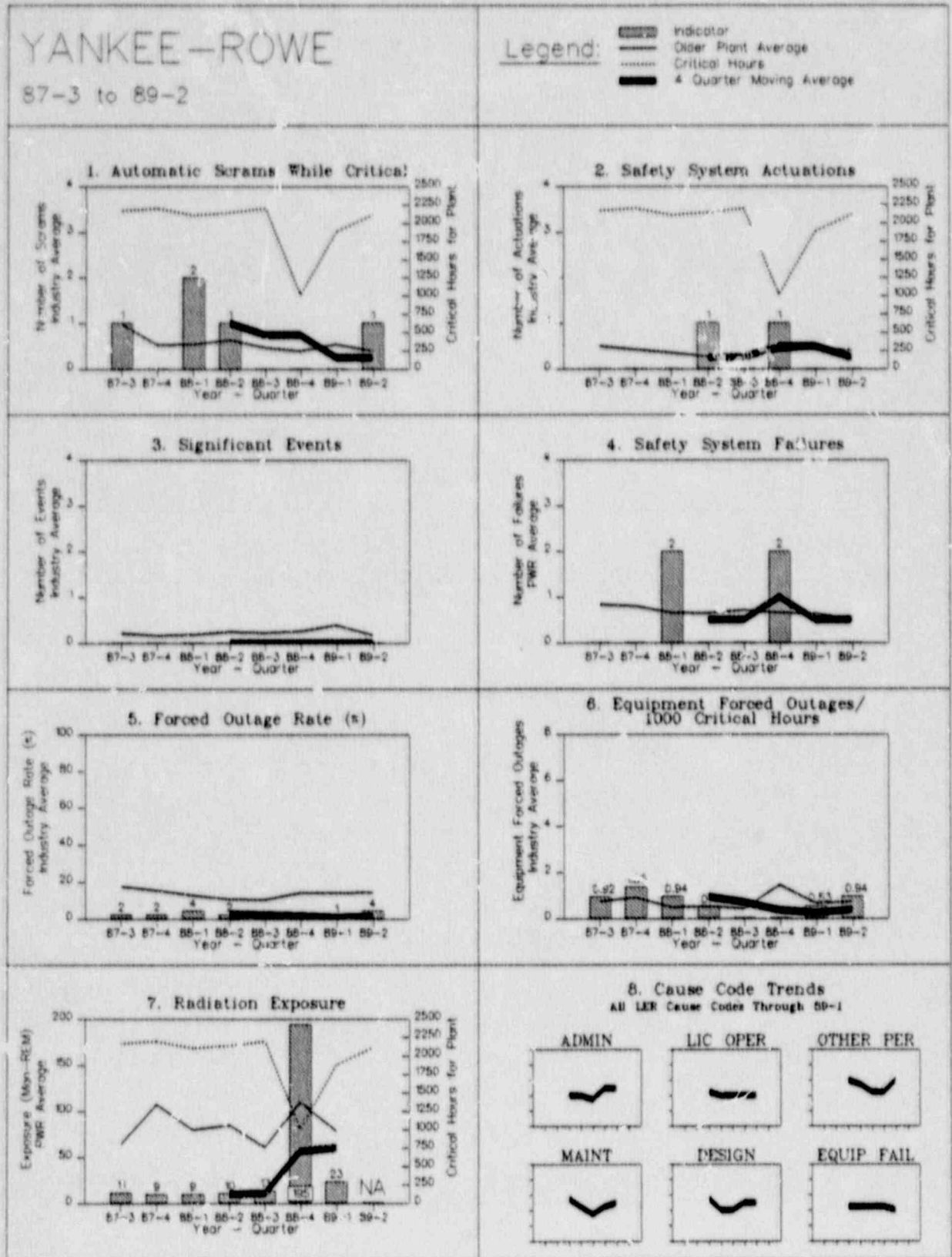


FIGURE 4.111

YANKEE-ROWE

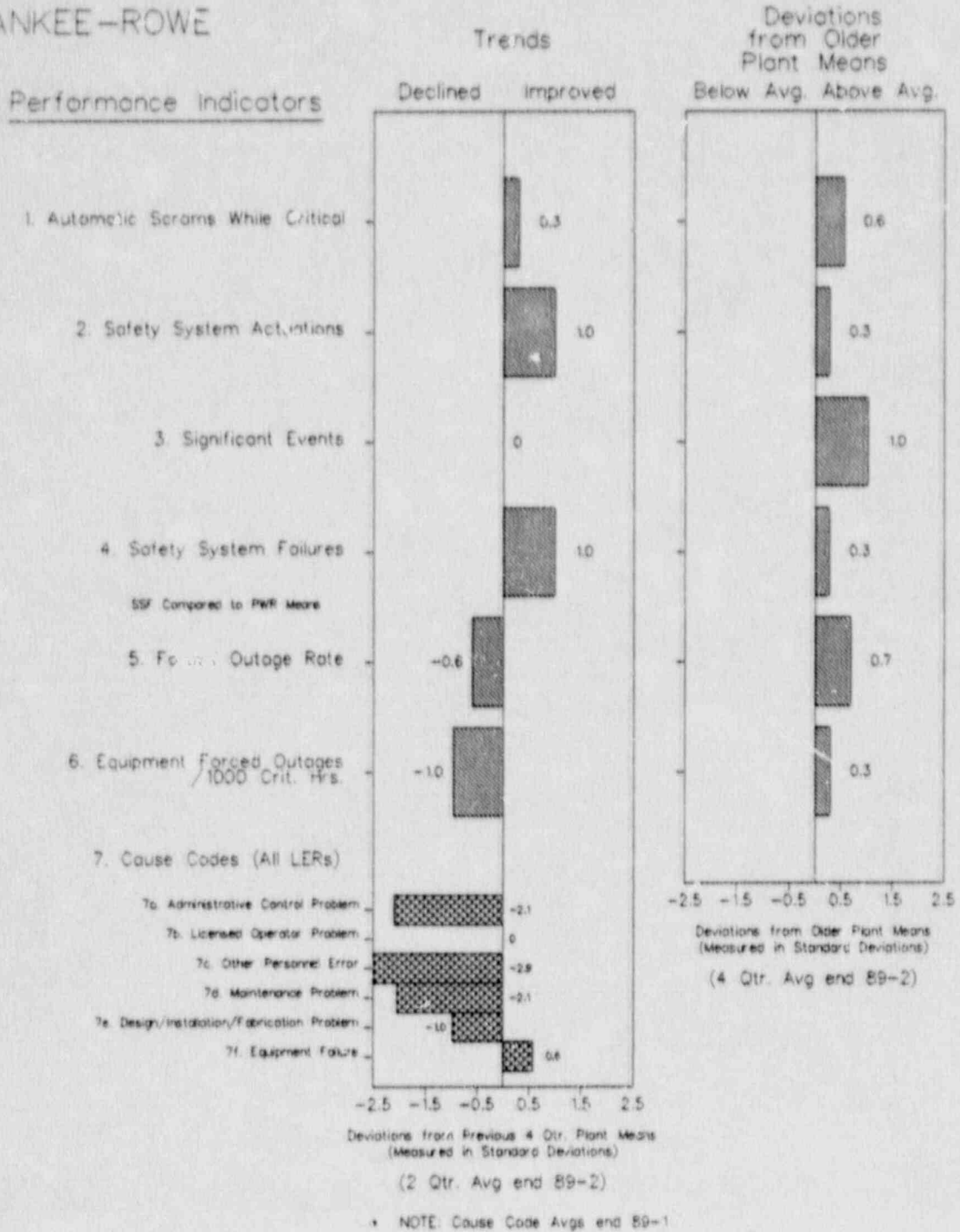


FIGURE 4.112

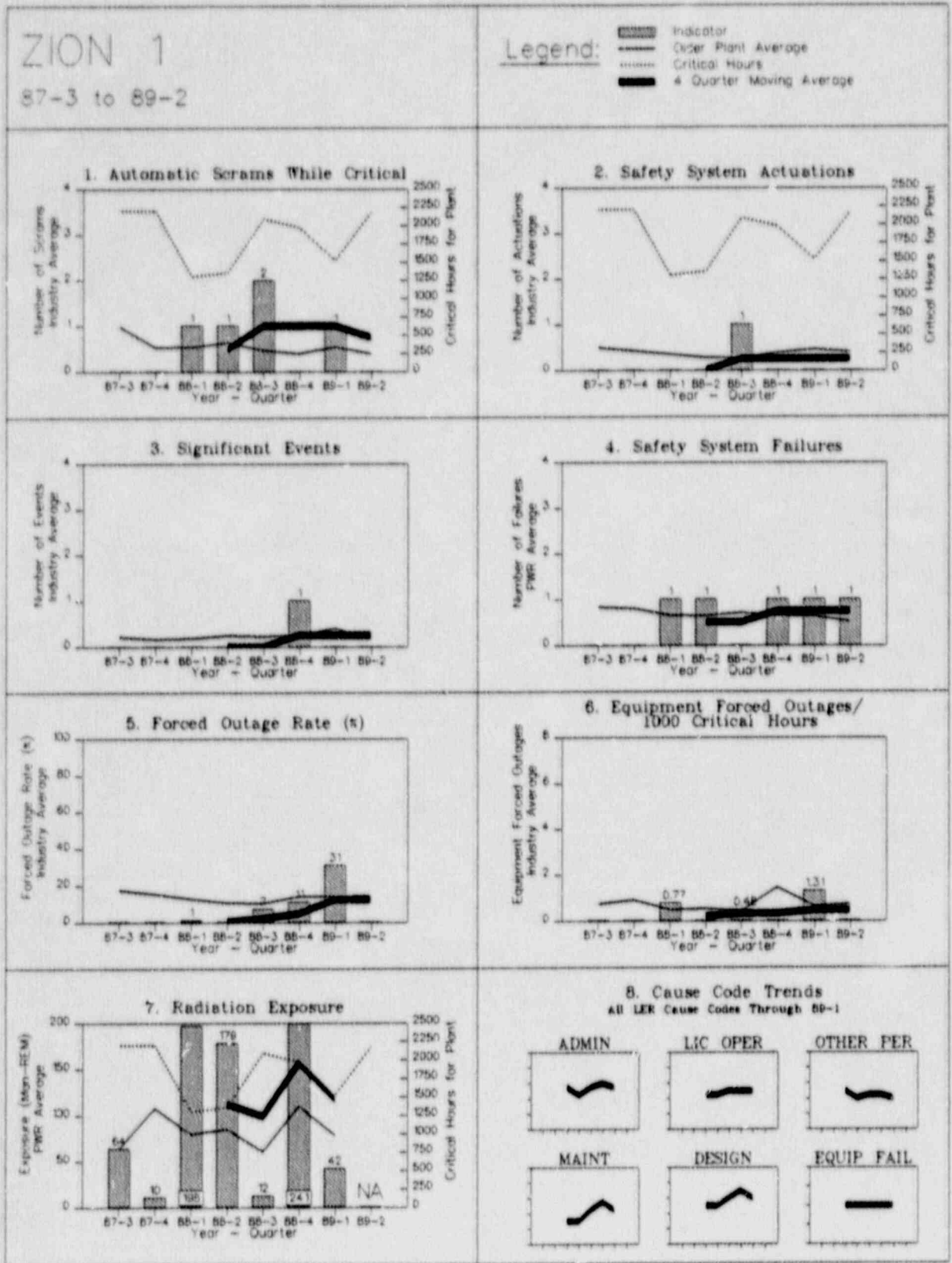
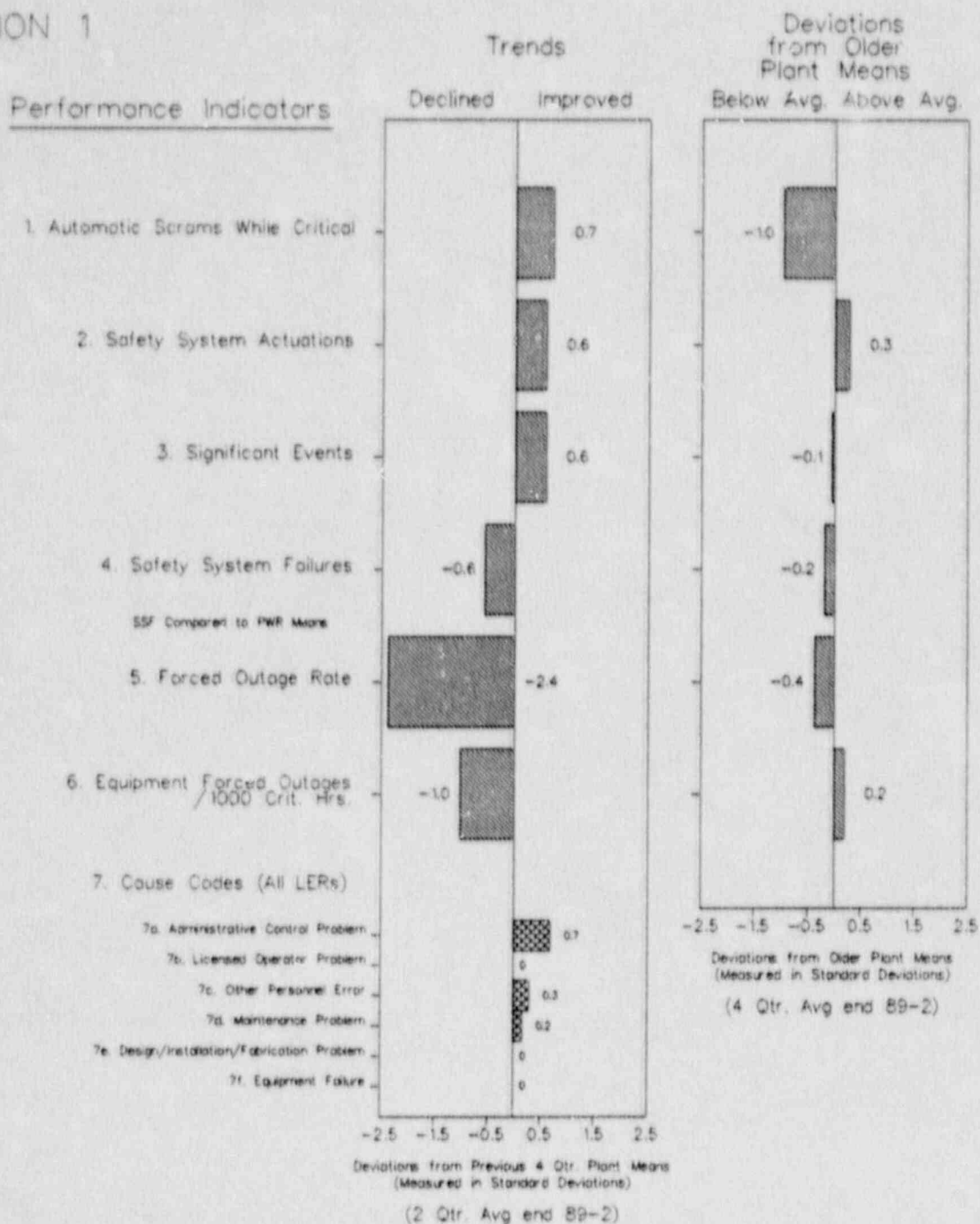


FIGURE 4.112

ZION 1



• NOTE: Cause Code Avgs end 89-1

FIGURE 4.113

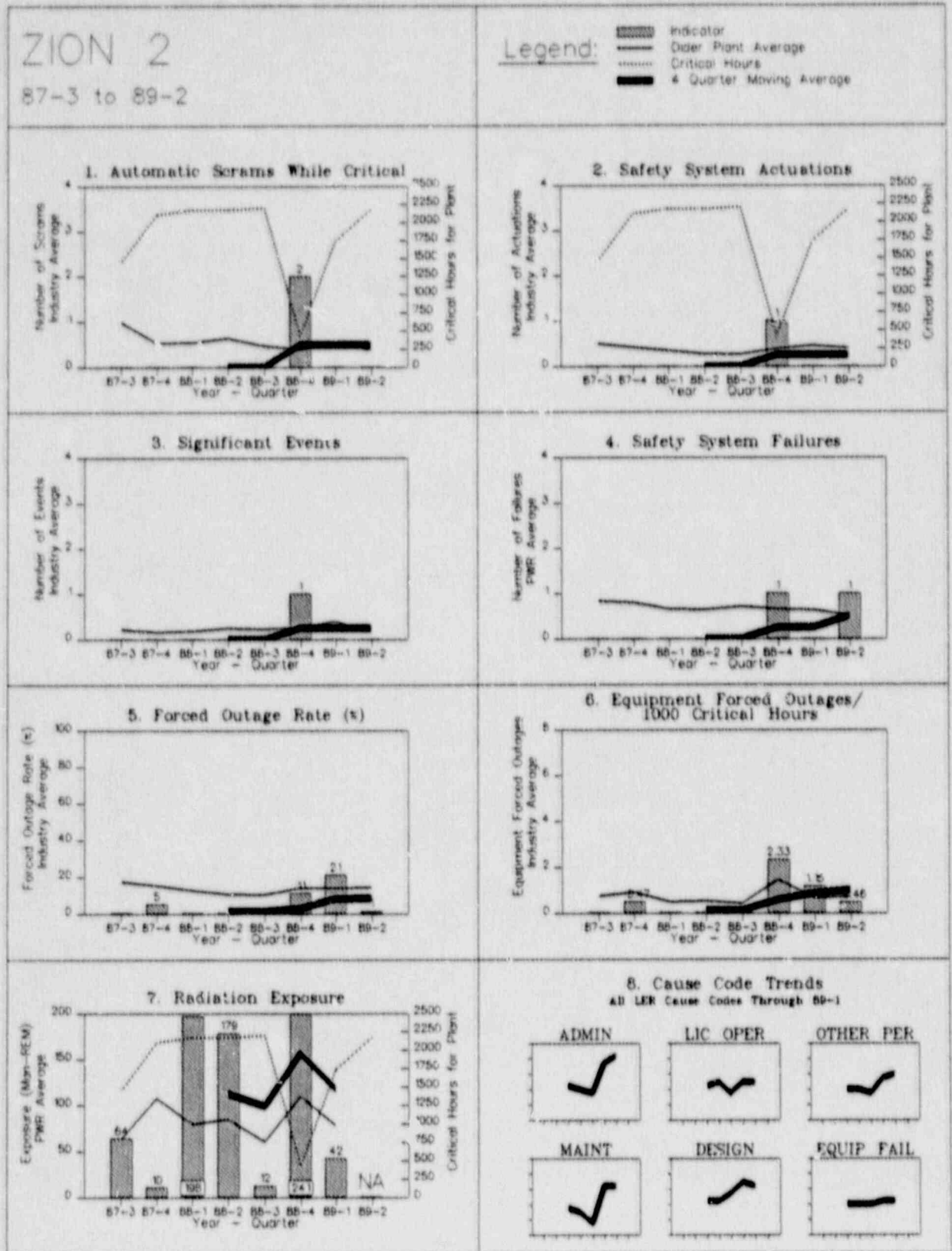
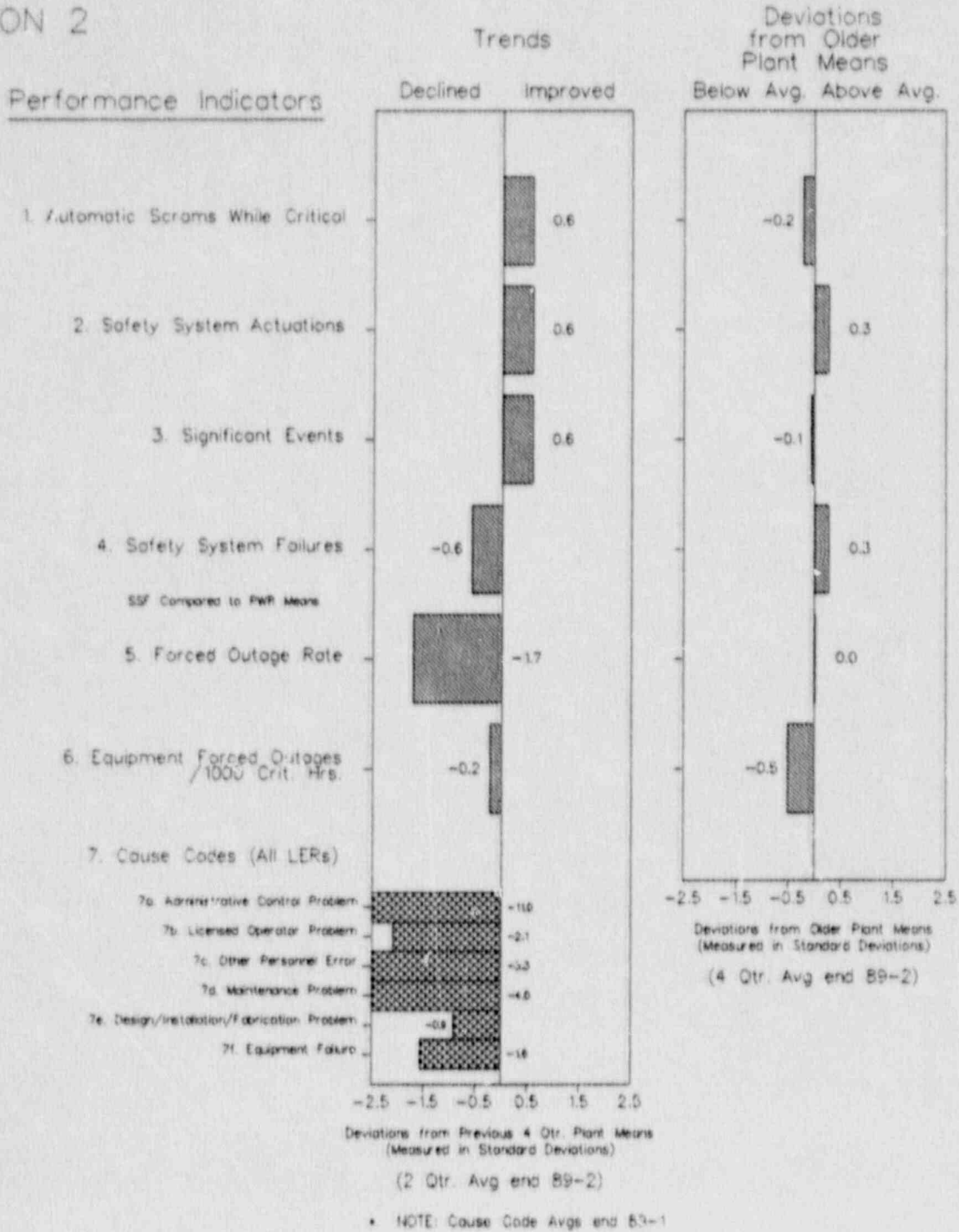




FIGURE 4.113

ZION 2





**PERFORMANCE INDICATORS FOR  
OPERATING COMMERCIAL NUCLEAR  
POWER REACTORS**  
Data through June 1989

OFFICE FOR ANALYSIS AND EVALUATION OF OPERATIONAL DATA

**PART II**

U.S. NUCLEAR REGULATORY COMMISSION

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**PERFORMANCE INDICATORS FOR  
OPERATING COMMERCIAL NUCLEAR  
POWER REACTORS**  
Data through June 1989

OFFICE FOR ANALYSIS AND EVALUATION OF OPERATIONAL DATA

**PART II**

U.S. NUCLEAR REGULATORY COMMISSION

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## 5. DETAILED DEFINITIONS OF INDICATORS

The definitions of the eight indicators currently in the program are provided below.

### 5.1 AUTOMATIC SCRAMS WHILE CRITICAL (SCRAMS)

These are the number of unplanned automatic scrams while the reactor is critical. This indicator is the same as the corresponding INPO indicator. Examples of the type of scrams included in this indicator are those that result from unplanned transients, equipment failures, spurious signals, or human error. Also included are those that occur during the execution of procedures in which there is a high chance of a scram occurring, but the occurrence of the scram is not planned. Scram data are primarily derived from 10 CFR 50.73 Licensee Event Report (LER) information and are supplemented as necessary from 10 CFR 50.72 reports. The reactor is "critical" if the report so states. Otherwise criticality is determined from the review of the information.

In addition to the data for this indicator, scrams above 15% power per 1000 critical hours and scrams below 15% power are provided in Tables 9.3 and 9.4, respectively as supplemental information.

### 5.2 SAFETY SYSTEM ACTUATIONS (SSA)

Safety system actuations are actuations of the emergency core cooling system (ECCS) (actual or spurious) and the emergency AC power system (actual, in response to low voltage on a safety bus). This indicator is equivalent to the corresponding INPO indicator. Input for this indicator is derived from LERs and is supplemented by 50.72 reports.

In determining what items should be included in the data for this indicator, the following conventions are used:

1. Only actuations of the high pressure injection system, low pressure injection system or safety injection tanks are counted for pressurized water reactors (PWRs). For boiling water reactors (BWRs), only actuations of the high pressure coolant injection system, the low pressure coolant injection system, the high pressure core spray system, or the low pressure core spray system are counted. Actuations of the reactor core isolation cooling system are not counted.
2. Actuations of emergency AC power systems that result from loss of power to a safeguards bus are captured primarily on the basis of indications of low voltage signals in the emergency power system.

3. Actuations of any of the equipment associated with the specific ECCS or emergency AC power system are considered necessary and sufficient to constitute a data count. For example, if only a valve in a system is commanded to move to its emergency operational position, this is counted as an actuation. A pump does not have to be commanded to go to its emergency mode of operation, or fluid does not need to be injection for an occurrence to be counted.
4. Only one ECCS actuation is counted in any one occurrence, even if multiple ECCS systems actuate during the occurrence. For example, actuation of both the high pressure injection and the low pressure injection systems at a PWR during the same occurrence counts as only a single ECCS actuation for that occurrence.
5. Only one emergency diesel generator (EDG) actuation is counted in any occurrence, even if multiple EDGs actuate during the occurrence. For example, actuation of all four EDGs at a unit counts as only a single actuation for that occurrence.
6. Occurrences involving actuations of both EDGs on the dead bus and an ECCS are given a count of two, one for the EDG actuation and one for the ECCS actuation.
7. At multi-unit sites that share equipment (e.g., swing EDG or shared buses), actuations are counted and assigned to the unit at which the actuation signal or loss of power originated. If the signal source cannot be associated with one unit, the actuation is assigned to both units.

### 5.3 SIGNIFICANT EVENTS (SE)

Significant events are those events identified by NRC staff through the detailed screening and evaluation of operating experience. The screening process includes the daily review and discussion of all reported operating reactor events and operational data, such as special tests being conducted or construction activity.

An event identified from the screening process as a candidate significant event is further evaluated to determine if any actual or potential threat to the health and safety of the public is involved. Specific examples of the type of criteria are summarized as follows.

1. Degradation of important safety equipment. Events considered under this classification include situations where there either existed the potential for or was an actual reduction in the operational capability of equipment. One example is the identification of a common cause failure mechanism which could cause redundant components or multiple independent components to fail in response to a test or actual demand signal. This category does not include such items as a missed surveillance test, during which the equipment was subsequently tested and determined to be operable.

2. Unexpected plant response to a transient. Events considered under this classification include situations in which changes in reactor parameters represent unanticipated reductions in margins of safety. For example, a rapid plant cooldown following a reactor trip exacerbated by a balance-of-plant malfunction or an undesirable systems interaction. This category does not include minor differences in predicted and observed conditions that can be reasonably explained by instrument errors or modeling techniques and simplifying assumptions.
3. Degradation of fuel integrity, primary coolant pressure boundary, or important associated structures. Events considered under this category include those of similar character to those identified in item 1, above related to the fuel, reactor coolant system (RCS) containment, or important plant structures.
4. Scram with complication. This event is an RPS actuation when critical, followed by an equipment failure, malfunction, or personnel error. The failure, malfunction, or error is generally not to include those that cause the transient that leads to the RPS actuation, or those that directly cause the scram. Failures that both cause the scram and reduce the capability of the mitigating system (e.g., electric power, instrument air, other auxiliary support functions, or deficient procedures) are counted.

Examples of equipment failure/malfunctions include:

- a. Mitigating system failures - Loss of redundancy due to single failures, reduced capacity, or margin. This includes components or trains out of service for maintenance.
- b. Failure adding to complexity of event - Erroneous control system responses, electrical switching difficulties, mitigating system and key plant parameter instrumentation malfunctions/failures.
- c. Additional event initiators - Stuck-open primary or secondary relief/safety valves, pipe breaks, and operating wrong equipment/trains.

Examples of personnel errors include:

- a. Improper control or termination of mitigating system.
- b. Misdiagnosis of the event or failure to follow procedures.

In addition to the situations described in items 1 through 4 above, other broad categories considered for significant events include:

5. Unplanned release of radioactivity. Events considered under this category include an unplanned release of radioactivity that had the potential for exceeding or actually exceeded the limits of the Technical Specifications or the Regulations.

6. Operation outside the limits of the Technical Specifications. Events considered under this classification include situations for which plant operation was conducted inconsistent with the license requirements.

This category applies to risk significant deviations and most likely does not include an incident involving a missed surveillance, small errors in setpoints, or other administratively inoperable conditions.

7. Other. For example, a series of events or recurring incidents that when considered collectively represent ineffective corrective actions, or a deficiency in the plant hardware or administrative programs.

#### 5.4 SAFETY SYSTEM FAILURES (SSF)

Safety system failures are any events or conditions that could prevent fulfillment of the safety function for structures or systems. If a system consists of multiple redundant subsystems or trains, failure of all trains constitutes a safety system failure. Failure of one or two or more trains is not counted as a safety system failure. The definition for the indicator parallels NRC reporting requirements in 10 CFR 50.72 and 10 CFR 50.73. The following list gives the major systems and subsystems which are monitored for this indicator:

- Reactor Trip System and Instrumentation
- Engineered Safety Features Instrumentation
- Recirculation Pump Trip Actuation Instrumentation
- Accident Monitoring Instrumentation
- Radiation Monitoring Instrumentation
- Reactor Coolant System
- Safety Valves
- Emergency Core Cooling Systems
- Auxiliary (and Emergency) Feedwater System
- Reactor Core Isolation Cooling System
- Isolation Condenser
- Standby Liquid Control System
- Main Steam Line Isolation Valves
- Component Cooling Water System
- Essential or Emergency Service Water
- Ultimate Heat Sink
- Control Room Emergency Ventilation System
- Onsite Emergency AC and DC Power and Associated Distribution
- Containment and Containment Isolation
- Containment Coolant Systems
- Residual Heat Removal Systems
- Combustible Gas Control
- Fire Detection and Suppression Systems
- Low Temperature Overpressure Protection
- Spent Fuel Systems
- Essential Compressed Air Systems

## **5.5 FORCED OUTAGE RATE (FOR)**

Forced outages are those required to be initiated no later than the end of the weekend following the discovery of an off-normal condition. The forced outage rate is the number of forced outage hours divided by the sum of unit service hours (i.e., generator on-line hours) and forced outage hours. This indicator is the same as that of INPO and the NRC monthly operating report. The data are generally obtained from the monthly operating reports. In some cases when the reports are not available, the data are obtained directly from the licensee.

## **5.6 EQUIPMENT FORCED OUTAGES PER 1000 CRITICAL HOURS (EFO)**

This indicator is the number of forced outages caused by equipment failures per 1000 hours of reactor critical operation. It is the inverse of the mean time between forced outages caused by equipment failures. The inverse number was adopted to facilitate calculation and display. The source of this data is the same as that for the forced outage rate.

## **5.7 COLLECTIVE RADIATION EXPOSURE**

This indicator is the total radiation dose at the site for a given period. To obtain unit values, the site total is divided by the number of units at the site contributing to the radiation exposure. This indicator is the same as that of INPO.

## **5.8 CAUSE CODE DEFINITIONS**

Beginning with this report the cause code trends performance indicator is incorporated. Cause code trend data lag other PI data by one quarter. Cause code trend data is developed using the NRC's Sequence Coding Search System (SCSS) database and is based on all Licensee Event Reports (LERs).

### **5.8.1 ADMINISTRATIVE CONTROL PROBLEM**

Management and supervisory deficiencies that affect plant programs or activities are included in this category. This code covers the implementation of the numerous functional disciplines necessary to operate a nuclear power facility such as operations, maintenance, licensing, design, health physics, etc. Examples of administrative control problems include poor planning, breakdown or lack of adequate management or supervisory control, inadequate interdepartmental coordination, poor communication between supervisors and staff or among departments, deficiencies resulting in weak or incorrect operating, surveillance or testing procedures, and departures from program requirements. The administrative cause code should be used if there is evidence that a particular problem is recurring and no correct action has been taken. This cause code is used in conjunction with other cause codes when necessary.

Specific examples are:

1. No corrective action after a design problem is discovered
2. QA/QC problems
3. Radioactive shipments without labeling
4. Unauthorized work activity
5. Unqualified personnel performing plant tasks
6. 10 CFR 50.59 review not performed
7. Personnel contamination due to lack of warning signs
8. Tech. Spec. surveillance not scheduled
9. Inadequate procedure resulted in inadvertent safety injection.

### **5.8.2 LICENSED OPERATOR ERROR**

This cause code captures errors of omission or commission by licensed reactor operators during plant activities. These errors may initiate events or may be committed during the course of an event. Licensed operator errors typically occur due to carelessness, lack of experience or training, fatigue, stress, attitude, or poor work habits. Improper supervision is also included whenever the event is the result of improper instructions given by a licensed operator such as an operations supervisor or control room shift supervisor. Not included in this category are instances when administrative control problems, such as incorrect procedures or inadequate planning activities caused the operator to take inappropriate actions.

Examples of licensed operator errors include:

1. Operator withdrew control rods out of order
2. Operator failed to bypass scram discharge volume high level trip following a trip. A second trip results.

### **5.8.3 OTHER PERSONNEL ERROR**

This cause code captures errors of omission or commission committed by non-licensed personnel involved in plant activities. Included in this category are plant staff (technicians, maintenance workers, equipment operators) and contract personnel. Not included in this category are administrative control problems, such as incorrect procedures or inadequate planning activities, which caused personnel to take inappropriate actions.

This cause code is used in conjunction with the maintenance code when an event is the result of a personnel error involved with a maintenance activity.

Examples of other personnel errors include:

1. Test personnel inadvertently shorts two cables while performing test
2. Maintenance personnel omits two fasteners while reassembling valve operator
3. Steps in surveillance procedure performed out of order.

#### **5.8.4 MAINTENANCE PROBLEM**

The intent of the maintenance cause code is to capture the full range of problems which can be attributed in any way to programmatic deficiencies in the maintenance functional organization. Activities included in this category are maintenance, testing, surveillance, calibration, and radiation protection.

The deficiencies noted within this group generally lead to (1) inadequate or improper upkeep and repair of plant equipment and systems or (2) inadequate programs to monitor equipment and plant performance as necessary to prevent hardware failures.

This is the broadest of all categories and is intended to identify area where improved plant performance is possible through a program which includes such things as more attention to detail more frequently performed surveillances, or the use of better trained personnel. The maintenance cause code is used to track the performance of plant management's capability to properly repair failed equipment and to preclude equipment failures through improved preventative maintenance programs. In addition those hardware failures which cannot be readily attributable to any preventable cause are included in the potential maintenance sub-category.

Maintenance related errors are often coupled with other cause codes such as Personnel or Administrative. The maintenance code is used in conjunction with other codes when an error occurs while a maintenance, surveillance, or test activity is in progress - whether the error was the result of a deficient procedure or a personnel error. Maintenance related errors are subdivided into four subcategories:

**5.8.4.1 MAINTENANCE PERSONNEL ERROR.** Errors committed by plant or contractor staff during the performance of equipment repair or replacement activities. The personnel error may be one of either omission or commission. The personnel error may be due to either an intrinsic error by personnel performing the task (in which case the maintenance cause code would be accompanied by a code for licensed operator error or other personnel error) or to an error caused by incorrect procedures (in which case the maintenance cause code would be accompanied by a code for administrative control problem).

Examples include:

1. Fasteners torqued incorrectly during valve operator reassembly
2. Pump shaft misaligned due to inadequate adjustment procedure
3. Loose parts found in pump casing following rebuild.

**5.8.4.2 TEST OR CALIBRATION PERSONNEL ERROR.** Personnel error committed by plant or contractor staff during the performance of test, surveillance, or calibration activities. The personnel error may be one of either omission or commission. The personnel error may be due to either an intrinsic error by personnel performing the task (in which case the maintenance cause code would be accompanied by a code for licensed operator error or other personnel error) or to an error caused by incorrect procedures (in which case the maintenance cause code would be accompanied by a code for administrative control Problem).

Examples include:

1. Instrument improperly calibrated due to error in procedure
2. Technician shorts test leads during testing
3. Test bypass switch moved out of sequence
4. Test or standby gas treatment charcoal filters not performed within allotted time interval.

**5.8.4.3 MAINTENANCE EQUIPMENT FAILURE.** Equipment failures that show evidence of time dependent degradation - such as setpoint drift, corrosion, erosion, aging, etc., - are considered preventable through increased surveillance and are therefore categorized as maintenance related.

Examples include:

1. MG set trip on high vibration due to worn out flywheel bearing
2. Pump suction filter leak due to failed gasket
3. Instrument calibration drift
4. Relief valve does not open within tolerance during operation or surveillance
5. Intergranular stress corrosion cracking
6. Pipe wall erosion
7. Cladding degradation (condenser circulating water piping cladding comes loose and clogs pump suction strainers)
8. Bearing failure due to low lube oil level.



Maintenance is also implied when effect codes for out of position, large leakage, cracked, low flow, out of calibration, or erroneous signal are used for equipment failures that required repair.

The equipment failures associated with the above cause or effect codes were examined for evidence of linkage to personnel errors. Failures which were attributable to personnel errors - such as maintenance errors, design errors, calibration errors, administrative control problems, etc. - were categorized under the appropriate personnel error category and not categorized under this equipment failure category. For example, although worn bearings might normally be indicative of a maintenance equipment problem, it would be considered as a design/fabrication/construction/ installation problem if the component was fabricated without the required lubrication fittings.

**5.8.4.4 POTENTIAL MAINTENANCE PROBLEM.** This subcategory of maintenance is intended to capture those hardware failures that cannot be readily attributable to a deficiency in maintenance programs, although a maintenance problem may be implied. Some equipment failures may be included in this group because of a lack of sufficient information in the LER necessary to completely ascertain the failure mechanism. Use this code if the problem might be maintenance related.

Examples include:

1. Steam generator tube leaks (when no cause is identified)
2. Fuel cladding degradation (when no cause or previous knowledge of the leak is identified)
3. Valve shaft shearing (root cause determination not yet concluded)
4. Pump impeller failure (root cause determination not yet concluded)
5. Spurious actuations or radiation monitors, toxic gas monitors, etc. when there is not evidence of a design deficiency.

The algorithms for this maintenance subcategory look for cause codes of:

missing	undercurrent
loose	overvoltage
tight	undervoltage
mechanical overload	open circuit
vibration	"other" electrical
"other" chemical	instrument repeatability
air or steam binding	electromagnetic noise
flow induced vibration	"other" instrumentation
high temperature	external fire or smoke
freezing condition	high ambient temperature
high thermal change rate	"other" ambient condition
"other" thermal-hydraulic	weld-related flaw
overcurrent	other
electrical overload	

In addition, the algorithms for this maintenance subcategory look for the following effect codes for equipment failures that required repair:

missing	dropped
maladjusted	break or shear
mispositioned	bend or deform
loose	find or jam
tight	short circuit
failure to open	open circuit
failure to close	failure to operate
small leakage	cessation or operation
medium leakage	

The equipment failures associated with the above cause or effect codes were examined for evidence of linkage to personnel errors. Failures which were attributable to personnel errors - such as maintenance personnel errors, design errors, calibration errors, administrative control problems, etc. - were categorized under the appropriate personnel error category and not categorized under the equipment failure category.

#### 5.8.5 DESIGN/CONSTRUCTION/INSTALLATION/FABRICATION PROBLEM

This code covers a full range of programmatic deficiencies in the areas of design, construction, installation, and fabrication. It is used in conjunction with other cause codes when necessary to capture all contributors to the event. One exception to the use of additional codes is that since the very nature of the design process implies a personnel error, it is not necessary to code personnel error code for the design error itself.

Examples of Design/Construction/Fabrication/Installation problems include:

1. Testable check valve being installed backwards resulted in RHR overpressurization when isolation valve opened
2. Transmitter sensing lines reversed
3. Loss of control power due to underrated fuse
4. Use of wrong seal material resulted in solenoid malfunction
5. Equipment not qualified for the environment
6. Defect discovered in pump casing attributed to a manufacturing defect.

The design modification process is an ongoing task at nuclear power plants.

Examples of design modification problems include:

1. Incorrect interpretation of plant drawings led to an incorrect design modification package

2. Incorrect modification package caused the installation of a component in an unfavorable configuration (e.g., incorrect wiring, incorrect location of instrumentation tubing, valve installed in wrong line, etc.)
3. Post modification test procedure is incorrect due to incorrect information in the design modification package.

The design error codes used in the above examples may be used in conjunction with other cause codes such as "Administrative Control Problem".

#### **5.8.5 EQUIPMENT FAILURES (ELECTRONIC PIECE-PART OR ENVIRONMENTAL-RELATED FAILURES)**

This code is used for spurious failures of electronic piece-parts (such as solid state components) and failures due to meteorological conditions such as lightning, ice, high winds, etc. Generally, it includes spurious or onetime failures. Electronic components which are included in this category are circuit cards, rectifiers, bistable, fuses, capacitors, diodes, resistors, transducers, amplifiers, and computation modules.

This category does not include failures that can be attributed to other problems, such as design/installation/fabrication problems or maintenance problems. Failures of mechanical equipment for which a cause can not be specifically identified are included in the maintenance category.

Examples of electronic piece-part or environmental-related failures include:

1. Flashovers occur in switchyard due to high wind and rain from sudden thunderstorm
2. Capacitor failure in instrument power supply causes loss of signal from containment leakage detection radiation monitor.
3. Surges from lightning strike close to plant propagate through plant electrical system and causes main generator to trip.

The algorithms used to identify spurious electronic piece-part or weather-related equipment failures look for (1) circuit cards, rectifiers, bistables, fuses, diodes, resistors, transducers, amplifiers, computation modules, modifiers, summers, and totalizers which suffered an actual failure requiring repair and which had an unknown cause of (2) actual equipment failures requiring repair due to lightning or high winds. Failures which were attributable to personnel activities were excluded.

## 6. PRECAUTIONS

The data for this report, except collective radiation exposure, were obtained from NRC sources and were reviewed by NRC personnel in headquarters and the regions for completeness and accuracy. Collective radiation exposure data is obtained from INPO. All data, with emphasis on the data for the most recent quarter, will be reviewed again in preparation for the next quarterly report in order to ensure that late information, if any, is accounted for.

Although certain NRC performance indicators are the same as those used by INPO as overall performance indicators, the criteria for including the data in the calculations for industry average are not the same in all cases. For example, INPO does not include scram values for the plants with cumulative capacity factors of less than 25% during the time period being considered in calculating the industry average. The NRC includes such plants. Therefore, the industry average values of the common indicator are likely to be different.

Tables 8.1 to 8.113 provide one-line descriptions of each performance indicator event for the third and fourth quarters 1988, and first and second quarters 1989.

For scrams above 15% power per 1000 critical hours and for equipment forced outages per 1000 critical hours, the results for plants with a small number of critical hours in a quarter can be distorted. For this report the degree of distortion has been reduced by using at least a minimum value of 200 critical hours in the calculation for any given quarter.

The forced outage rate is the ratio of forced outage hours divided by the sum of online generator and forced outage hours. For example, in a quarter a plant spends 1000 hours in a scheduled outage, 300 hours in a forced outage, and 800 hours online, the forced outage rate would be  $300/(800+300) = 27.3\%$ .

Collective radiation exposure is the total dose accumulated by station personnel at a site divided by the number of units at the site.

Collective radiation exposure and cause code data lag by one quarter.

## 7. COMPUTATIONAL NOTES

The following computational notes describe some of the detailed methods used in calculations and displays for this report.

- 7.1. The report addresses plants licensed for operation in the second quarter 1989 or earlier.
- 7.2. NAs are used under the following conditions for newer plants:
  1. For all indicators, until an operating license is first received,
  2. For scrams, until critical hours are first reported, or
  3. For forced outages, until commercial operation is declared.

Thereafter, numerical values are used. For example, plants shut down for an entire quarter after initial criticality have zeros for scrams rather than blanks.

- 7.3. Blanks are not used in calculating averages and standard deviations. Zeros do count in such calculations.
- 7.4. For plant summaries (Figures 4.1 - 4.113 of Part I)
  1. The left chart, "Trends", is based on the following numbers:
    - a. The plant's moving average for the most recent two-quarter period.
    - b. The plant's moving average for the prior four-quarter period (if there are not at least two quarters of data for this moving average, no value is displayed on the chart), and
    - c. A standard deviation based on the plant's current four-quarter period data (if the standard deviation is zero, an average of values for older or newer plants, as appropriate, is used);
  2. The right chart, "Deviations from Older Plant Means" or "Deviations from Newer Plant Means", uses the following numbers:
    - a. Moving average of the plant's current four-quarter period (if there are not at least two quarters for this, no value is displayed on the chart),
    - b. Average of the current four-quarter period moving averages for older plants or newer plants (outliers more than 2.5 standard deviations from the mean on the first calculation were discarded and the mean and standard deviation were recomputed), and

- c. Standard deviation based on the current four-quarter period moving averages for older or newer plants (outliers were discarded as discussed above); and
  3. Moving averages (average of four quarterly values) are used throughout rather than calculating true means (e.g., annual averages) for ratios such as equipment forced outages per 1000 critical hours.
- 7.5. The following parameters were used for detailed plant analysis charts of each plant's quarterly data (Figures 4.1 through 4.113 of Part I).
  1. Older plant averages are the averages of older plant values calculated quarter by quarter. Older plant averages for safety system failures and collective radiation exposure are computed separately for BWRs and PWRs.<sup>1</sup>
  2. Newer plant averages are single numbers that span all quarters.
    - a. Moving average of the plant's current four-quarter period (if there are not at least two quarters for this, no value is displayed on the chart),
    - b. Average of the current four-quarter period moving averages for older plants or newer plants (outliers more than 2.5 standard deviations from the mean on the first calculation were discarded and the mean and standard deviation were recomputed).
    - c. Standard deviation based on the current four-quarter period moving averages for older or newer plants (outliers were discarded as discussed above);
  3. Moving averages (average of four quarterly values) are used throughout rather than calculating true means (e.g., annual averages) for ratios such as equipment forced outages per 1000 critical hours.
- 7.6. For certain plants in long-term shutdown, such as Browns Ferry, the scram, forced outage rate, and equipment forced outage bars were suppressed in the plant summary charts.

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1. Older plant averages for Ft. St. Vrain includes all older plants.

**8. DESCRIPTIONS OF PLANT EVENTS  
THIRD AND FOURTH QUARTERS 1988,  
AND FIRST AND SECOND QUARTERS 1989**

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**TABLE 8.1**  
**ARKANSAS 1**

**PI EVENTS FOR 88-3**

**SSF** 09/02/88 LER# 31388010 50.72#: 13949 POWER: 0  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: SERVICE WATER FLOW RATES THROUGH SOME SAFETY RELATED COMPONENTS NOT ADEQUATE WHEN THE SYSTEM DISCHARGE IS DIRECTED TO THE EMERGENCY COOLING POND. DISCOVERED WHILE TESTING.

**SSF** 09/26/88 LER# 31388008 50.72#: 13550 POWER: 0  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: ERRORS IN ORIGINAL DESIGN ANALYSIS OF THE EXHAUST OF THE EMERGENCY DIESEL GENERATORS. UNCERTAINTY OF THEIR ABILITY TO WITHSTAND A SEISMIC EVENT. NOT CONSIDERED TO BE OPERABLE PER T.S.

**PI EVENTS FOR 88-4**

**SE** 10/26/88 LER# 31388014 50.72#: POWER: 0  
DESC: LOSS OF TWO TRAINS OF DECAY HEAT REMOVAL WHEN A TECHNICIAN PULLED THE WRONG FUSE. (MORNING REPORT: 10/27/88)

**SSF** 10/26/88 LER# 31388014 50.72#: POWER: 0  
SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
DESC: FUSE TO THE CONTROLLERS FOR BOTH DHR COOLER OUTLET VALVES WAS INADVERTENTLY REMOVED (UNLABELED), VALVES CLOSED, WHICH IS INCONSISTENT WITH THEIR DESIGN. POSITIONER OUTLET LINES WERE REVERSED.

**SSF** 11/12/88 LER# 31388017 50.72#: 13932 POWER: 0  
SYSTEM: ULTIMATE HEAT SINK SYSTEM  
DESC: EXCESSIVE LEAKAGE (325 GPM VS. T.S. LIMIT OF 3 GPM) OF ESW SLUICE GATES. POTENTIAL FOR LOSS OF ULTIMATE HEAT SINK AS THE EMERGENCY COOLING POND WAS DRAINING. FAILURE TO PERFORM SURVEILLANCE AND MAINT.

**SE** 12/16/88 LER# 50.72#: 14275 POWER: 0  
DESC: PACKING FAILURE OF 2 1/2 INCH GATE VALVE IN CHARGING LINE DURING MAINTENANCE.

**PI EVENTS FOR 89-1**

**SSA** 01/20/89 LER# 31389002 50.72#: 14546 POWER: 100  
DESC: "B" FEEDWATER BLOCK VALVE FAILED TO CLOSE DUE TO INCORRECT TORQUE SETTING. "A" AND "B" MFW STARTUP AND LOW LOAD CONTROL VALVES FAILED TO CLOSE DUE TO MISWIRING LEADING TO SG OVERFILLING.

**SE** 01/20/89 LER# 31389002 50.72#: 14546 POWER: 100  
DESC: MULTIPLE COMPLICATIONS AND REACTOR COOLANT SYSTEM BOUNDARY CHECK VALVE LEAKAGE.

**SCRAM** 01/20/89 LER# 31389002 50.72#: 14546 POWER: 100  
DESC: A BROKEN CONNECTION STRAP IN THE AC EXCITER FIELD CAUSED MAIN GENERATOR LOCKOUT, A TURBINE TRIP AND A REACTOR TRIP. BUS H1 FAILED TO FAST-TRANSFER TO OFFSITE POWER CAUSING A TRIP OF TWO REACTOR COOLANT PUMPS.

**SSF** 02/09/89 LER# 31389006 50.72#: 14707 POWER: 0  
SYSTEM: HIGH PRESSURE SAFETY INJECTION SYSTEM  
DESC: RECENT ANALYSIS HAS SHOWN THAT PORTIONS OF THE PIGGYBACK FLOW PIPING COULD BE EXPOSED TO A WORST CASE TEMPERATURE HIGHER THAN QUALIFIED DESIGN TEMPERATURE. THE PIGGYBACK MODE WAS NOT INCORPORATED IN THE INITIAL DESIGN BASIS.

**PI EVENTS FOR 89-2**

**SCRAM** 05/01/89 LER# 31389018 50.72#: 15499 POWER: 50  
DESC: THE MAIN TURBINE TRIPPED DURING MAINTENANCE AFTER A WORKER BUMPED A CABINET THAT HOUSES VARIOUS PRESSURE SWITCHES. THE TURBINE TRIP CAUSED A REACTOR TRIP.

TABLE 8.1 (CONT.)

ARKANSAS 1 (CONT.)

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.46	.00	.46	.00	.00	.00	1.92	.57
SCRAMS < 15% POWER	1	0	0	0	0	0	0	0
TOTAL SCRAMS	2	0	1	0	0	0	1	1
SAFETY SYSTEM ACTUATIONS	1	0	0	0	0	0	1	0
SIGNIFICANT EVENTS	1	0	0	0	0	2	1	0
SAFETY SYSTEM FAILURES	0	0	1	0	2	2	1	0
FORCED OUTAGE RATE (%)	4	1	2	0	0	38	77	21
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.92	.64	.46	.00	.00	2.39	1.92	.57
CRITICAL HOURS	2177	1561	2152	2183	1402	419	520	1744
COLLECTIVE RADIATION EXPOSURE	40	72	185	133	134	242	64	NA
CAUSE CODES:								
ADMINISTRATIVE	2	3	3	1	1	7	3	NA
LICENSED OPERATOR	1	0	0	0	0	4	1	NA
OTHER PERSONNEL	1	1	1	0	3	4	1	NA
MAINTENANCE	3	1	3	1	4	7	3	NA
A) MAINT PERSONNEL	1	0	1	1	2	4	1	NA
B) SURV AND TEST	0	1	2	0	1	3	1	NA
C) EQUIPMENT	2	0	0	0	1	1	1	NA
D) POTENTIAL MAINT	2	0	0	0	0	1	1	NA
DESIGN/INSTALLATION/FABRICATION	0	3	2	0	5	4	3	NA
EQUIPMENT FAILURE	2	0	1	0	0	0	0	NA

**TABLE 8.2  
ARKANSAS 2**

**PI EVENTS FOR 88-3**

**SSA** 08/01/88 LER# 36888011 50.72#: POWER: 0  
DESC: HPSI MANUALLY STARTED ABOUT 2 HOURS AFTER SCRAM TO CONTROL PZR LEVEL DURING COOLDOWN.

**SE** 08/01/88 LER# 36888011 50.72#: 13055 POWER: 0  
DESC: REACTOR COOLANT PUMP SEAL INSTRUMENT LINE FAILURE.

**PI EVENTS FOR 88-4**

**SSF** 11/11/88 LER# 36888019 50.72#: 14026 POWER: 0  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: 2 OF 3 SERVICE WATER PUMPS HAD CORRODED SNAP RINGS WHICH RESULTED IN IMPELLER & CASING DAMAGE. 3RD PUMP ALSO CORRODED. PUMPS HAD EXHIBITED HIGH STARTING CURRENT WHICH PROMPTED THE INSPECTIONS.

**SSF** 11/12/88 LER# 31388017 50.72#: 13932 POWER: 100  
SYSTEM: ULTIMATE HEAT SINK SYSTEM  
DESC: EXCESSIVE LEAKAGE (325 GPM VS. T.S. LIMIT OF 3 GPM) OF ESW SLUICE GATES. POTENTIAL FOR LOSS OF ULTIMATE HEAT SINK AS THE EMERGENCY COOLING POND WAS DRAINING. FAILURE TO PERFORM SURVEILLANCE AND MAINT.

**SCRAM** 12/01/88 LER# 36888020 50.72#: 14124 POWER: 100  
DESC: WHILE TESTING THE CONTAINMENT COOLING ACTUATION SYSTEM AND SIAS ANOTHER CHANNEL ALARMED CAUSING A REACTOR SCRAM.

**PI EVENTS FOR 89-1**

**SSF** 03/01/89 LER# 36889004 50.72#: POWER: 100  
SYSTEM: HIGH PRESSURE SAFETY INJECTION SYSTEM  
DESC: THE HPSI SYSTEM WAS DECLARED TO BE INOPERABLE DURING STARTUP BECAUSE THE STARTUP PROCEDURE ALLOWED ENTERING MODE 4 PRIOR TO LINING UP THE HPSI SUCTION FOR AUTOMATIC TRANSFER FROM THE REFUELING WATER TANK TO THE CONTAINMENT SUMP.

**PI EVENTS FOR 89-2**

**SE** 04/18/89 LER# 36889006 50.72#: 15369 POWER: 0  
DESC: RUPTURE OF EXTRACTION STEAM PIPE DUE TO EROSION.

**SCRAM** 04/18/89 LER# 36889006 50.72#: 15369 POWER: 100  
DESC: A PIPE RUPTURE DUE TO PIPE WALL THINNING CAUSED SATURATION IN THE TURBINE CONTROL LEADING TO A TURBINE TRIP AND A REACTOR TRIP. VERY POOR RE CONSIDERING SEVERITY OF EVENT.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.51	.46	.00	.00	.00	.46	.00	.64
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	1	1	0	0	0	1	0	1
SAFETY SYSTEM ACTUATIONS	0	0	2	1	1	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	1	0	0	1
SAFETY SYSTEM FAILURES	0	0	1	1	0	2	1	0
FORCED OUTAGE RATE (%)	12	1	0	3	21	1	8	29
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	1.02	.46	.00	.95	1.13	.00	.50	1.29
CRITICAL HOURS	1957	2186	1028	1056	1767	2181	2000	1553
COLLECTIVE RADIATION EXPOSURE	40	72	185	133	134	242	64	NA
CAUSE CODES:								
ADMINISTRATIVE	1	2	1	4	2	2	2	NA
LICENSED OPERATOR	0	0	0	0	0	1	0	NA
OTHER PERSONNEL	1	1	4	2	1	1	1	NA
MAINTENANCE	2	1	2	5	3	5	3	NA
A) MAINT PERSONNEL	2	1	1	3	1	0	1	NA
B) SURV AND TEST	0	0	1	2	2	3	1	NA
C) EQUIPMENT	0	0	0	1	0	3	0	NA
D) POTENTIAL MAINT	0	0	0	0	0	2	1	NA
DESIGN/INSTALLATION/FABRICATION	1	1	2	2	3	0	0	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

**TABLE 8.3**  
**BEAVER VALLEY 1**

**PI EVENTS FOR 88-3**

NONE

**PI EVENTS FOR 88-4**

NONE

**PI EVENTS FOR 89-1**

**SCRAM** 01/17/89 LER# 33489001 50.72#: 14522 POWER: 90  
DESC: OPERATOR OPENED WRONG BREAKER TO FRV INSTEAD OF BYPASS FRV CAUSING LOSS OF FEED AND LOW SG LEVEL FF/SF MISMATCH SCRAM.

**SCRAM** 02/13/89 LER# 33489002 50.72#: 14745 POWER: 90  
DESC: FAULTY PNEUMATIC CONVERTER CAUSED FRV TO FAIL PARTIALLY CLOSED CAUSING LOW SG LEVEL SCRAM.

**PI EVENTS FOR 89-2**

**SSA** 05/18/89 LER# 33489007 50.72#: 15637 POWER: 90  
DESC: SI ON LOW STEAM LINE PRESSURE WHEN POWER WAS LOST TO THE AMSAC PANEL. THIS CAUSED TURBINE BYPASS VALVES TO OPEN.

**SCRAM** 05/18/89 LER# 33489007 50.72#: 15637 POWER: 90  
DESC: DESIGN DEFICIENCY OF THE ATWS MITIGATING SYSTEM ACTUATION CIRCUITRY (AMSAC) CAUSED LOSS OF POWER TO THE AMSAC PANEL DUE TO OPERATOR ERROR WHICH CAUSED LOW STEAM LINE PRESSURE SI REACTOR TRIP.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.96	.00	.00	.94	.47
SCRAMS < 15% POWER	0	0	0	1	0	0	0	0
TOTAL SCRAMS	0	0	0	3	0	0	2	1
SAFETY SYSTEM ACTUATIONS	0	0	0	1	0	0	0	1
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	0	0	0	0	0	0	0	0
FORCED OUTAGE RATE (%)	0	0	0	4	1	9	2	4
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	1.30	1.43	.00	.50	.47	.00
CRITICAL HOURS	2208	1727	771	2091	2191	2014	2119	2109
COLLECTIVE RADIATION EXPOSURE	9	152	483	23	10	13	59	NA
CAUSE CODES:								
ADMINISTRATIVE	2	1	3	2	0	1	1	NA
LICENSED OPERATOR	1	0	1	1	2	2	1	NA
OTHER PERSONNEL	0	1	0	2	1	0	0	NA
MAINTENANCE	3	5	5	3	3	2	3	NA
A) MAINT PERSONNEL	0	3	2	1	0	0	0	NA
B) SURV AND TEST	3	0	1	2	1	2	1	NA
C) EQUIPMENT	1	2	2	1	1	0	2	NA
D) POTENTIAL MAINT	1	3	2	0	1	0	1	NA
DESIGN/INSTALLATION/FABRICATION	0	3	1	1	0	1	0	NA
EQUIPMENT FAILURE	0	1	0	0	0	0	1	NA

**TABLE 8.4  
BEAVER VALLEY 2**

**PI EVENTS FOR 88-3**

**SCRAM** 07/27/88 LER# 41288009 50.72#: 12988 POWER: 100  
DESC: DURING SURVEILLANCE TESTING OF SHUTDOWN BANK 'A' ROD MOTION, BANK 'A' RODS DROPPED CAUSING A REACTOR TRIP ON NEGATIVE RATE.

**SCRAM** 09/20/88 LER# 41288013 50.72#: 13494 POWER: 100  
DESC: A FAULTY CIRCUIT CARD CAUSED A SPURIOUS HIGH OVERPOWER DELTA TEMPERATURE SIGNAL DURING TESTING AND CAUSED A REACTOR TRIP.

**PI EVENTS FOR 88-4**

NONE

**PI EVENTS FOR 89-1**

**SCRAM** 02/12/89 LER# 41289003 50.72#: 14736 POWER: 65  
DESC: ERRATIC OPERATION OF 'C' TRV DUE TO FAILED ANTI-ROTATION PIN AND STEM DETACHING FROM THE VALVE PLUG CAUSED HIGH SG LEVEL TURBINE TRIP SCRAM.

**SSA** 03/22/89 LER# 41289005 50.72#: 15088 POWER: 0  
DESC: SI WHEN TWO SIMULTANEOUS TESTINGS OF PZR CHANNELS CAUSED SI SIGNAL - NO FLOW FROM SI PUMPS DUE TO VALVES BEING TAGGED SHUT. ONE ACCUMULATOR INJECTED WATER.

**PI EVENTS FOR 89-2**

**SSA** 04/27/89 LER# 41289012 50.72#: 15465 POWER: 0  
DESC: WHILE TESTING THE UNDERVOLTAGE RELAYS OF THE SAFETY INJECTION PUMP THE FEEDER BREAKER ON "A" EMERGENCY BUS OPENED. THE DIESEL STARTED AND SEQUENCED ON LOADS.

**SSA** 04/28/89 LER# 41289013 50.72#: 15472 POWER: 0  
DESC: EMERGENCY DIESEL GENERATOR "A" STARTED DUE TO A MOMENTARY LOSS OF TRAIN "A" OFF-SITE POWER. IT DID NOT LOAD BECAUSE ITS OUTPUT BREAKER WAS RACKED OUT FOR TESTING.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	8.28	3.50	.56	.46	.94	.00	.59	.00
SCRAMS < 15% POWER	2	1	0	0	0	0	0	0
TOTAL SCRAMS	7	7	1	1	2	0	1	0
SAFETY SYSTEM ACTUATIONS	3	2	2	0	0	0	1	2
SIGNIFICANT EVENTS	0	1	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	2	0	0	0	0	0	0	0
FORCED OUTAGE RATE (%)	NA	11	4	2	5	0	8	41
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	NA	1.17	1.12	.92	.47	.00	.59	1.99
CRITICAL HOURS	604	1715	1785	2163	2128	2209	1695	502
COLLECTIVE RADIATION EXPOSURE	NA	NA	NA	NA	NA	NA	59	NA
CAUSE CODES:								
ADMINISTRATIVE	10	3	2	0	1	1	3	NA
LICENSED OPERATOR	4	1	0	0	1	3	0	NA
OTHER PERSONNEL	7	2	2	0	1	0	1	NA
MAINTENANCE	17	10	4	1	3	3	7	NA
A) MAINT PERSONNEL	4	3	2	0	0	0	0	NA
B) SURV AND TEST	12	2	1	0	1	3	3	NA
C) EQUIPMENT	3	3	1	1	2	0	2	NA
D) POTENTIAL MAINT	1	4	1	1	1	0	3	NA
DESIGN/INSTALLATION/FABRICATION	4	3	1	1	1	1	1	NA
EQUIPMENT FAILURE	2	0	0	0	2	0	0	NA

**TABLE 8.5**  
**WIG ROCK POINT**

**PI EVENTS FOR 88-3**

NONE

**PI EVENTS FOR 88-4**

**SSA** 10/28/88 LER# 15588008 50.72#: 13843 POWER: 95  
DESC: CONTROL ROD DRIVE MG SET FAILED TO TRANSFER AN SCRAM. FIVE SECOND LOSS OF STATION POWER CAUSED A DIESEL START BUT DID NOT LOAD AS AUTOMATIC TRANSFER RESTORED POWER.

**SCRAM** 10/28/88 LER# 15588008 50.72#: 13843 POWER: 95  
DESC: LOSS OF STATION POWER DUE TO OFFSITE FAULT ON GRID CAUSED A REACTOR TRIP

**SCRAM** 11/21/88 LER# 15588009 50.72#: 14064 POWER: 93  
DESC: THE CONNECTING ROD TO TURBINE CONTROL VALVES FAILED AND CAUSED THE VALVES TO CLOSE. REACTOR PRESSURE AND POWER INCREASED. THE REACTOR TRIPPED ON HIGH WIDE RANGE POWER.

**PI EVENTS FOR 89-1**

**SSF** 01/20/89 LER# 15589001 50.72#: 14542 POWER: 24  
SYSTEM: DC POWER SYSTEM - CLASS 1E  
DESC: INSTALLED FUSES IN THE ALTERNATE SHUTDOWN BATTERY SYSTEM WERE NOT SIZED PROPERLY (TOO SMALL AND FAST). SYSTEM DECLARED INOPERABLE. CAUSED BY COMMUNICATION PROBLEM DURING DESIGN MODIFICATION REVIEW.

**PI EVENTS FOR 89-2**

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.95	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	0	0	2	0	0
SAFETY SYSTEM ACTUATIONS	0	0	1	0	0	1	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	0	0	0	0	0	0	1	0
FORCED OUTAGE RATE (%)	5	9	8	17	8	6	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.94	1.04	1.00	4.42	.48	.95	.00	.00
CRITICAL HOURS	2117	1922	1997	226	2076	2096	2063	1678
COLLECTIVE RADIATION EXPOSURE	9	15	25	106	14	11	16	NA
CAUSE CODES:								
ADMINISTRATIVE	1	0	1	1	0	0	1	NA
LICENSED OPERATOR	1	0	2	0	0	0	0	NA
OTHER PERSONNEL	1	0	0	0	0	2	0	NA
MAINTENANCE	1	0	1	2	1	2	1	NA
A) MAINT PERSONNEL	0	0	0	1	0	2	0	NA
B) SURV AND TEST	0	0	0	0	0	0	1	NA
C) EQUIPMENT	0	0	1	1	1	0	0	NA
D) POTENTIAL MAINT	1	0	0	0	1	0	0	NA
DESIGN/INSTALLATION/FABRICATION	0	2	1	2	0	0	1	NA
EQUIPMENT FAILURE	0	0	0	0	0	1	0	NA

**TABLE 8.6**  
**BRAIDWOOD 1**

**PI EVENTS FOR 88-3**

**SCRAM** 08/11/88 LER# 45688016 50.72#: 13165 POWER: 100  
DESC: REPLACING FUSES TO GRIPPER COILS TO CRD'S WHEN OPERATORS ATTEMPTED TO MOVE RODS CAUSING NEGATIVE FLUX RATE SCRAM WHEN RODS DROPPED.

**PI EVENTS FOR 88-4**

**SSA** 10/16/88 LER# 45688022 50.72#: 13734 POWER: 95  
DESC: LOSS OF OFFSITE POWER CAUSED DIESEL TO START AND SUPPLY SAFEGUARDS BUS (XFMR BLEWUP OFFSITE CAUSING VOLTAGE SURGE CAUSING BKRS TO TRIP).

**SCRAM** 10/16/88 LER# 45688022 50.72#: 13734 POWER: 95  
DESC: LOST OFFSITE POWER DUE TO A TRANSFORMER EXPLOSION OFFSITE CAUSING A REACTOR TRIP ON LOSS OF POWER AUXILIARY FEEDWATER STARTED TO COOLDOWN THE PLANT.

**PI EVENTS FOR 89-1**

**SCRAM** 03/06/89 LER# 45689004 50.72#: 14942 POWER: 97  
DESC: TURBINE GOVERNOR VALVES CLOSED DUE TO A FAULTY TEST SWITCH CAUSING SG SHRINK AND A REACTOR TRIP ON LOW SG LEVEL.

**PI EVENTS FOR 89-2**

**SSA** 04/16/89 LER# 45689002 50.72#: 15355 POWER: 0  
DESC: DURING PLANT HEAT UP AND PRESSURIZATION, THE PRESSURIZFR PRESSURE WENT ABOVE SAFETY INJECTION SETPOINT WHILE STEAMLINE PRESSURE REMAINED LOW. THIS CAUSED A SAFETY INJECTION INITIATION.

**SE** 04/18/89 LER# 50.72#: POWER: 0  
DESC: INATTENTIVE EMPLOYEES OBSERVED IN CONTROL ROOM AND AT THE AUXILIARY BUILDING RADIOLOGICAL CONTROL EXIT. EVENT INVOLVES UNIT 2 ALSO. (PN-111-89-29)

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.94	.50	.00	.00	.50	.47	.61	.00
SCRAMS < 15% POWER	2	0	0	0	0	0	0	0
TOTAL SCRAMS	3	1	0	0	1	1	1	0
SAFETY SYSTEM ACTUATIONS	2	0	1	0	0	1	0	1
SIGNIFICANT EVENTS	0	0	1	0	0	0	0	1
SAFETY SYSTEM FAILURES	1	1	0	0	0	0	0	0
FORCED OUTAGE RATE (%)	NA	NA	NA	NA	11	7	4	4
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	NA	NA	NA	NA	.00	.95	1.21	.51
CRITICAL HOURS	1060	2000	86	1557	1996	2108	1648	1961
COLLECTIVE RADIATION EXPOSURE	NA	NA	55	10	5	5	50	NA

CAUSE CODES:

ADMINISTRATIVE	8	3	2	5	3	1	0	NA
LICENSED OPERATOR	4	2	1	0	1	0	1	NA
OTHER PERSONNEL	6	1	2	1	0	1	0	NA
MAINTENANCE	20	6	7	6	6	3	3	NA
A) MAINT PERSONNEL	5	1	0	2	1	1	0	NA
B) SURV AND TEST	11	2	4	3	3	0	0	NA
C) EQUIPMENT	7	2	3	1	0	2	0	NA
D) POTENTIAL MAINT	3	3	3	1	2	1	3	NA
DESIGN/INSTALLATION/FABRICATION	3	1	1	0	0	2	0	NA
EQUIPMENT FAILURE	2	0	1	0	2	0	0	NA

TABLE 8.7  
BRAIDWOOD 2

PI EVENTS FOR 88-3

**SCRAM** 07/02/88 LER# 45788018 50.72#: 12713 POWER: 40  
DESC: PZR PRESSURE BISTABLE TRIPPED WHEN ANOTHER BISTABLE ALREADY IN TRIPPED POSITION CAUSING SCRAM.

**SSF** 09/19/88 LER# 45788023 50.72#: 13486 POWER: 0  
SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
DESC: BOTH RHR TRAINS WERE DECLARED INOPERABLE DUE TO INADEQUATE COMPLETION OF VENTING PROCEDURE FOLLOWING THE LAST SURVEILLANCE EXECUTION. SYSTEM WAS NOT ADEQUATELY VENTED.

**SCRAM** 09/19/88 LER# 45788022 50.72#: 13492 POWER: 2  
DESC: SRM HIGH FLUX BLOCK DROPPED OUT DUE TO A LOOSE CONNECTION CAUSING SCRAM ON HIGH SRM.

**SCRAM** 09/29/88 LER# 45788026 50.72#: 13582 POWER: 38  
DESC: INCOMPATIBLE GROUND CIRCUITRY BETWEEN THE MEASURING TEST EQUIPMENT AND SG LEVEL CHANNELS CAUSED HIGH SG LEVEL TURBINE TRIP - SCRAM DURING TESTING.

PI EVENTS FOR 88-4

**SCRAM** 10/17/88 LER# 45688023 50.72#: 13744 POWER: 88  
DESC: LIGHTNING INDUCED VOLTAGE TRANSIENT CAUSED VARIOUS PROTECTORS TO REMOVE POWER TO CRD CAUSING RODS TO DROP AND SCRAM ON HIGH NEGATIVE FLUX RATE.

**SCRAM** 11/05/88 LER# 45788031 50.72#: 13922 POWER: 50  
DESC: CRD BECAME DEENERGIZED DUE TO AN INCORRECT OVERVOLTAGE RELAY SETTING WHEN REPLACING FUSES CAUSING RODS TO DROP INTO CORE CAUSING NEGATIVE FLUX RATE SCRAM.

**SCRAM** 11/17/88 LER# 45788028 50.72#: 14029 POWER: 6  
DESC: COLD MAIN FEEDWATER WAS INJECTED INTO SG CAUSING LOW SG LEVEL SCRAM DUE TO A PROCEDURAL DEFICIENCY FOR OPENING MAIN FEEDWATER ISOLATION VALVES AT LOW POWER.

PI EVENTS FOR 89-1

**SSF** 02/23/89 LER# 45789001 50.72#: 14833 POWER: 0  
SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
DESC: WITH THE "A" TRAIN RHR PUMP OUT OF SERVICE FOR TESTING, THE "B" RHR SUCTION VALVE CLOSED AS A RESULT OF A TEST SIGNAL. THE PROCEDURE DID NOT IDENTIFY THAT PLACING THE SSPS IN THE TEST MODE WOULD NOT BLOCK THE AUTO-CLOSURE OF THE RHR SUCTION VALVES.

PI EVENTS FOR 89-2

**SE** 04/18/89 LER# 50.72#: POWER: 0  
DESC: INATTENTIVE EMPLOYEES OBSERVED IN CONTROL ROOM AND AT THE AUXILIARY BUILDING RADIOLOGICAL CONTROL EXIT. EVENT INVOLVES UNIT 1 ALSO. (PN-111-89-29)

**SCRAM** 05/11/89 LER# 45789002 50.72#: 15588 POWER: 67  
DESC: 345KV OFF-SITE POWER LINE TRIPPED; GENERATOR OUTPUT BREAKERS TRIPPED; TURBINE TRIP SCRAM DUE TO THE MAIN GENERATOR TRIPPING.



TABLE 8.7 (CONT.)  
BRAIDWOOD 2 (CONT.)

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	NA	NA	.00	3.62	1.02	1.11	.00	.46
SCRAMS < 15% POWER	NA	NA	0	1	1	1	0	0
TOTAL SCRAMS	NA	NA	0	4	3	3	0	1
SAFETY SYSTEM ACTUATIONS	NA	0	1	0	0	0	0	0
SIGNIFICANT EVENTS	NA	0	1	0	0	0	0	1
SAFETY SYSTEM FAILURES	NA	0	0	0	1	0	1	0
FORCED OUTAGE RATE (%)	NA	NA	NA	NA	NA	18	0	2
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	NA	NA	NA	NA	NA	1.98	.00	.46
CRITICAL HOURS	NA	0	192	829	1968	1807	1127	2152
COLLECTIVE RADIATION EXPOSURE	NA	NA	NA	NA	NA	NA	NA	NA
CAUSE CODES:								
ADMINISTRATIVE	NA	0	1	2	3	3	1	NA
LICENSED OPERATOR	NA	0	1	1	0	0	0	NA
OTHER PERSONNEL	NA	1	5	1	2	1	0	NA
MAINTENANCE	NA	1	6	8	9	4	2	NA
A) MAINT PERSONNEL	NA	1	3	0	3	1	0	NA
B) SURV AND TEST	NA	0	2	2	2	2	1	NA
C) EQUIPMENT	NA	0	0	4	2	2	0	NA
D) POTENTIAL MAINT	NA	0	1	5	3	1	1	NA
DESIGN/INSTALLATION/FABRICATION	NA	0	-	1	2	2	0	NA
EQUIPMENT FAILURE	NA	0	0	0	1	1	0	NA

**TABLE 8.8**  
**BROWNS FERRY 1**

**PI EVENTS FOR 88-3**

**SSF** 08/26/88 LER# 29688003 50.72#: 13297 POWER: 0  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: THE EMERGENCY DIESEL GENERATORS WERE DECLARED INOPERABLE DUE TO SEISMIC CONCERNS OF THE BATTERY SUPPORT RACKS FOR THE 125 VDC SYSTEM. DID NOT MEET DRAWING CONFIGURATION AND SEISMIC QUALIFICATION.

**SSF** 09/09/88 LER# 25988025 50.72#: 13421 POWER: 0  
SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
DESC: DESIGN ERROR IN CONTROL ROOM EMERGENCY VENTILATION SYSTEM THAT DURING CERTAIN CONDITIONS, IF AN ACCIDENT WERE TO OCCUR THE CONTROL BUILDING COULD BECOME PRESSURIZED-DOSE TO OPERATORS 300 REM THYROID.

**PI EVENTS FOR 88-4**

**SSF** 10/18/88 LER# 25988034 50.72#: 13755 POWER: 0  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: OVERHEATING OF DIESEL GENERATOR FIELD BREAKERS WHEN LOADED TO 95% OF RATED CAPACITY. HIGH LOCALIZED TEMPERATURES ABOVE THE BREAKER DESIGN EXISTED, COULD HAVE RESULTED IN LOSS OF AC POWER SOURCES.

**SSA** 11/01/88 LER# 25988045 50.72#: 13882 POWER: 0  
DESC: BREAKER FAILED TO CLOSE WHILE SHIFTING POWER SUPPLIES CAUSING UNDERVORTAGE ON SHUTDOWN BUS FOR ABOUT 30 SECONDS, DIESEL DID NOT LOAD BUS.

**SSA** 11/01/88 LER# 25988044 50.72#: 13879 POWER: 0  
DESC: SHIFTING POWER SUPPLIES AND OPERATOR DID NOT HOLD SWITCH LONG ENOUGH TO ENSURE BREAKER SHUT CAUSING DIESEL START ON MOMENTARY LOW VOLTS.

**SSA** 11/01/88 LER# 25988045 50.72#: 13882 POWER: 0  
DESC: BREAKER FAILED TO CLOSE WHILE SHIFTING POWER SUPPLIES CAUSING UNDERVORTAGE ON SHUTDOWN BUS FOR ABOUT 30 SECONDS, DIESEL DID NOT LOAD BUS.

**PI EVENTS FOR 89-1**

**SE** 01/31/89 LER# 50.72#: 14606 POWER: 0  
DESC: UPON LOSS OF INSTRUMENT AIR, CONTAINMENT ISOLATION VALVE (WHICH IS A BUTTERFLY VALVE) WILL FAIL IN THE OPEN POSITION, THUS LOSING ONE OF THE CONTAINMENT ISOLATION BARRIERS. (SIMILAR TO NORTH ANNA 1 & 2, MORNING REPORT 01/13/89, BRIEFING # 89-03).

**SE** 02/08/89 LER# 25989002 50.72#: 14689 POWER: 0  
DESC: ALL PARTS OF THE EMERGENCY EQUIPMENT COOLING WATER SYSTEM ARE NOT SEISMIC CLASS I PER THE COMMITMENT IN FSAR 10.10.2.2.

**SSF** 02/08/89 LER# 25989002 50.72#: 14689 POWER: 0  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: MANY COMPONENTS AND SYSTEMS DECLARED INOPERABLE AT ALL 3 BROWNS FERRY UNITS. DESIGN REVIEW - ESW DISCHARGES INTO UNQUALIFIED HEADERS. FAILURE OF HEADER COULD PREVENT ESW FROM PERFORMING SAFETY FUNCTION.

**SSA** 03/09/89 LER# 26089008 50.72#: 14980 POWER: 0  
DESC: A BUS TO GROUND FAULT ON '2B' UNIT SERVICE STATION TRANSFORMER WHICH LEAD TO A LOSS OF SHUTDOWN BUS 2 CAUSED DIESELS "C" AND "D" TO START BUT NOT LOAD.

**PI EVENTS FOR 89-2**

NONE

**TABLE 8.8 (CONT.)**  
**BROWNS FERRY 1 (CONT.)**

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	0	0	0	0	0
SAFETY SYSTEM ACTUATIONS	0	0	1	1	0	3	1	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	2	0
SAFETY SYSTEM FAILURES	2	0	2	0	2	1	1	0
FORCED OUTAGE RATE (%)	100	100	100	100	100	100	100	100
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.00
CRITICAL HOURS	0	0	0	0	0	0	0	0
COLLECTIVE RADIATION EXPOSURE	81	65	85	110	36	76	42	NA
CAUSE CODES:								
ADMINISTRATIVE	6	3	8	3	12	11	9	NA
LICENSED OPERATOR	0	0	1	1	1	3	3	NA
OTHER PERSONNEL	9	0	3	2	3	6	2	NA
MAINTENANCE	15	2	11	5	12	20	10	NA
A) MAINT PERSONNEL	2	0	3	3	5	5	6	NA
B) SURV AND TEST	9	0	6	1	5	11	4	NA
C) EQUIPMENT	4	1	1	0	1	6	3	NA
D) POTENTIAL MAINT	6	1	2	1	2	6	0	NA
DESIGN/INSTALLATION/FABRICATION	3	0	1	2	8	6	6	NA
EQUIPMENT FAILURE	2	0	0	0	0	0	0	NA

**TABLE 8.9**  
**BROWNS FERRY 2**

**PI EVENTS FOR 88-3**

**SSF** 08/26/88 LER# 29688003 50.72#: 13297 POWER: 0  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: THE EMERGENCY DIESEL GENERATORS WERE DECLARED INOPERABLE DUE TO SEISMIC CONCERNS OF THE BATTERY SUPPORT RACKS FOR THE 125 VDC SYSTEM. DID NOT MEET DRAWING CONFIGURATION AND SEISMIC QUALIFICATION.

**SSF** 09/09/88 LER# 25988025 50.72#: 13421 POWER: 0  
SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
DESC: DESIGN ERROR IN CONTROL ROOM EMERGENCY VENTILATION SYSTEM. DURING CERTAIN CONDITIONS, IF AN ACCIDENT WERE TO OCCUR THE CONTROL BUILDING COULD BECOME PRESSURIZED -DOSE TO OPERATORS 300 REM THYROID.

**PI EVENTS FOR 88-4**

**SSF** 10/18/88 LER# 25988034 50.72#: 13755 POWER: 0  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: OVERHEATING OF DIESEL GENERATOR FIELD BREAKERS WHEN LOADED TO 95% OF RATED CAPACITY. HIGH LOCALIZED TEMPERATURES ABOVE THE BREAKER DESIGN EXISTED, COULD HAVE RESULTED IN LOSS OF AC POWER SOURCES.

**SSA** 12/09/88 LER# 26088016 50.72#: 14195 POWER: 0  
DESC: 2D RHR/LPCI PUMP STARTED WHEN AUX OPERATOR PUSHED START BUTTON INSTEAD OF STOP BUTTON.

**SSA** 12/18/88 LER# 26088017 50.72#: 14286 POWER: 0  
DESC: OPERATOR TOOK WRONG SWITCH TO TEST CAUSING '2C' CORE SPRAY PUMPT TO START - DISCHARGE VALVE TAGGED SHUT.

**PI EVENTS FOR 89-1**

**SSF** 01/20/89 LER# 26089002 50.72#: 14545 POWER: 0  
SYSTEM: AUTOMATIC DEPRESSURIZATION SYSTEM  
DESC: SEISMIC DOCUMENTATION FOR 6 ADS PRESSURE SWITCHES MISSING. POTENTIAL LOSS OF DRYWELL CONTROL AIR SYSTEM, ADS, AND ABILITY OF OPERATORS TO CONTROL MAIN STEAM RELIEF VALVES AND CLOSE MSIVS.

**SE** 01/31/89 LER# 50.72#: 14606 POWER: 0  
DESC: UPON LOSS OF INSTRUMENT AIR, CONTAINMENT ISOLATION VALVE (WHICH IS A BUTTERFLY VALVE) WILL FAIL IN THE OPEN POSITION, THUS LOSING ONE OF THE CONTAINMENT ISOLATION BARRIERS. (SIMILAR TO NORTH ANNA 1 & 2, MORNING REPORT 01/13/89, BRIEFING # 89-03).

**SE** 02/08/89 LER# 25989002 50.72#: 14689 POWER: 0  
DESC: ALL PARTS OF THE EMERGENCY EQUIPMENT COOLING WATER SYSTEM ARE NOT SEISMIC CLASS I PER THE COMMITMENT IN FSAR 10.10.2.2.

**SSF** 02/08/89 LER# 25989002 50.72#: 14689 POWER: 0  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: MANY COMPONENTS AND SYSTEMS DECLARED INOPERABLE AT ALL 3 BROWNS FERRY UNITS. DESIGN REVIEW - ESW DISCHARGES INTO UNQUALIFIED HEADER. FAILURE OF HEADER COULD PREVENT ESW FROM PERFORMING SAFETY FUNCTION.

**SSA** 03/09/89 LER# 26089008 50.72#: 14980 POWER: 0  
DESC: A BUS TO GROUND FAULT ON '2B' UNIT SERVICE STATION TRANSFORMER WHICH LEAD TO A LOSS OF SHUTDOWN BUS 2 CAUSED DIESELS "C" AND "D" TO START BUT NOT LOAD.

**PI EVENTS FOR 89-2**

**SSF** 04/05/89 LER# 26089012 50.72#: POWER: 0  
SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
DESC: BOTH TRAINS OF RHR INOPERABLE. TRAIN I INOPERABLE DUE TO IMPROPER ELECTRICAL LOADING DURING ABNORMAL ELECTRICAL LINEUP. LOADING INSTRUCTIONS NOT TRANSMITTED TO SHIFT OPERATORS PRIOR TO LINEUP. TRAIN II WAS OOS FOR MAINTENANCE.

**TABLE 8.9 (CONT.)**  
**BROWNS FERRY 2 (CONT.)**

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	0	0	0	0	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	2	1	0
SIGNIFICANT EVENTS	0	1	0	0	0	0	2	0
SAFETY SYSTEM FAILURES	3	0	2	0	2	1	2	1
FORCED OUTAGE RATE (%)	100	100	100	100	100	100	100	100
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.00
CRITICAL HOURS	0	0	0	0	0	0	0	0
COLLECTIVE RADIATION EXPOSURE	81	65	85	110	36	76	42	NA
CAUSE CODES:								
ADMINISTRATIVE	6	2	7	3	12	12	10	NA
LICENSED OPERATOR	0	0	1	1	1	3	3	NA
OTHER PERSONNEL	11	0	3	3	3	10	3	NA
MAINTENANCE	12	2	9	7	12	22	11	NA
A) MAINT PERSONNEL	2	0	3	4	5	6	6	NA
B) SURV AND TEST	9	0	5	1	5	13	5	NA
C) EQUIPMENT	3	1	0	1	1	5	3	NA
D) POTENTIAL MAINT	3	1	1	2	2	5	0	NA
DESIGN/INSTALLATION/FABRICATION	3	0	1	2	8	6	7	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

**TABLE 8.10**  
**BROWNS FERRY 3**

**PI EVENTS FOR 88-3**

**SSF** 08/26/88 LER# 29688003 50.72#: 13797 POWER: 0  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: THE EMERGENCY DIESEL GENERATORS WERE DECLARED INOPERABLE DUE TO SEISMIC CONCERNS OF THE BATTERY SUPPORT RACKS FOR THE 125 VDC SYSTEM. DID NOT MEET DRAWING CONFIGURATION AND SEISMIC QUALIFICATION.

**SSF** 09/09/88 LER# 25988025 50.72#: 13421 POWER: 0  
SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
DESC: DESIGN ERROR IN CONTROL ROOM EMERGENCY VENTILATION SYSTEM THAT DURING CERTAIN CONDITIONS, IF AN ACCIDENT WERE TO OCCUR THE CONTROL BUILDING COULD BECOME PRESSURIZED. DUE TO OPERATORS 300 REM THYROID.

**PI EVENTS FOR 88-4**

**SSF** 10/18/88 LER# 25988034 50.72#: 13755 POWER: 0  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: OVERHEATING OF DIESEL GENERATOR FIELD BREAKERS WHEN LOADED TO 95% OF RATED CAPACITY. HIGH LOCALIZED TEMPERATURES ABOVE THE BREAKER DESIGN EXISTED, COULD HAVE RESULTED IN LOSS OF AC POWER SOURCES.

**SSA** 11/08/88 LER# 29688005 50.72#: 13939 POWER: 0  
DESC: REBUILT BREAKER FAILED TO SHUT CAUSING LOSS OF 4160 V BUS AND DIESEL START.

**PI EVENTS FOR 89-1**

**SE** 01/31/89 LER# 50.72#: 14606 POWER: 0  
DESC: UPON LOSS OF INSTRUMENT AIR, CONTAINMENT ISOLATION VALVE (WHICH IS A BUTTERFLY VALVE) WILL FAIL IN THE OPEN POSITION, THUS LOSING ONE OF THE CONTAINMENT ISOLATION BARRIERS. (SIMILAR TO NORTH ANNA 1 & 2, MORNING REPORT 01/13/89, BRIEFING # 89-03).

**SE** 02/08/89 LER# 25989002 50.72#: 14689 POWER: 0  
DESC: ALL PARTS OF THE EMERGENCY EQUIPMENT COOLING WATER SYSTEM ARE NOT SEISMIC CLASS I PER THE COMMITMENT IN FSAR 10.10.2.2.

**SSF** 02/08/89 LER# 25989002 50.72#: 14689 POWER: 0  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: MANY COMPONENTS AND SYSTEMS DECLARED INOPERABLE AT ALL 3 BROWNS FERRY UNITS. DESIGN REVIEW - ESW DISCHARGES INTO UNQUALIFIED HEADER. FAILURE OF HEADER COULD PREVENT ESW FROM PERFORMING SAFETY FUNCTION.

**PI EVENTS FOR 89-2**

NONE

**TABLE 8.10 (CONT.)**  
**BROWNS FERRY 3 (CONT.)**

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	0	0	0	0	0
SAFETY SYSTEM ACTUATIONS	0	1	0	0	0	1	0	0
SIGNIFICANT EVENTS	0	0	0	1	0	0	2	0
SAFETY SYSTEM FAILURES	2	0	2	1	2	1	1	0
FORCED OUTAGE RATE (%)	100	100	100	100	100	100	100	100
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.00
CRITICAL HOURS	0	0	0	0	0	0	0	0
COLLECTIVE RADIATION EXPOSURE	81	65	85	110	75	76	42	NA
CAUSE CODES:								
ADMINISTRATIVE:								
LICENSED OPERATOR	4	3	7	3	12	10	7	NA
OTHER PERSONNEL	0	0	1	1	1	3	3	NA
MAINTENANCE	7	1	2	3	4	6	3	NA
A) MAINT PERSONNEL	9	5	9	6	13	19	9	NA
B) SURV AND TEST	1	1	3	4	6	5	6	NA
C) EQUIPMENT	7	1	5	1	5	11	2	NA
D) POTENTIAL MAINT	2	3	0	0	1	5	3	NA
DESIGN/INSTALLATION/FABRICATION	3	2	1	1	2	5	0	NA
EQUIPMENT FAILURE	2	0	1	2	8	6	6	NA
	1	0	0	0	0	0	0	NA

TABLE 8.11

BRUNSWICK 1

PI EVENTS FOR 88-3

**SSF** 07/01/88 LER# 32588017 50.72#: 12697 POWER: 68  
 SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
 DESC: DURING PERFORMANCE OF HPCI OPERABILITY TEST, THE HPCI STEAM SUPPLY ISOLATION VALVE FAILED TO OPEN AND ITS ASSOCIATED BREAKER TRIPPED. MOTOR WINDING FAILURE - DESIGN ERROR SEVERE ENVIRONMENT.

**SE** 07/05/88 LER# 32588019 50.72#: 12721 POWER: 0  
 DESC: POTENTIAL COMMON MODE FAILURE OF MULTIPLE HPCI (& RCIC) DC MOTOR OPERATED VALVES. BRUNSWICK 2 LICENSED IN 1974.

**SSF** 07/13/88 LER# 32588018 50.72#: 12811 POWER: 95  
 SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
 DESC: HPCI DECLARED INOPERABLE WHEN THE TORUS SUCTION VALVE DID NOT OPEN DURING TEST. A BENT FINGER ASSEMBLY OF A LIMIT SWITCH IN THE INTERLOCK LOGIC, CAUSED BY PERSONNEL DURING PREVIOUS INSPECTION.

**SSF** 07/25/88 LER# 32488012 50.72#: 12951 POWER: 0  
 SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
 DESC: THE HIGH PRESSURE COOLANT INJECTION SYSTEM WAS DECLARED INOPERABLE WHEN IT WAS DISCOVERED THAT THE EQ OF THE ELECTRICAL TERMINATION/SPLICES ON THE AUX OIL PUMP COULD NOT BE ASSURED. INITIAL CONSTRUCT.

**SSF** 09/15/88 LER# 32588020 50.72#: 13455 POWER: 84  
 SYSTEM: REACTOR CORE ISOLATION COOLING SYSTEM  
 DESC: RCIC DECLARED INOPERABLE AFTER ISOLATION VALVE TRIPPED DURING TESTING. TURBINE THEN TRIPPED ON HIGH EXHAUST PRESSURE AS UNEXPECTED. ATTEMPTS TO RESTART TURBINE FAILED, CAUSED BY DAMAGED SPEED SENSOR.

PI EVENTS FOR 88-4

**SCRAM** 10/21/88 LER# 32588023 50.72#: 13783 POWER: 27  
 DESC: MAIN FEEDWATER SINGLE ELEMENT CONTROL INSTRUMENT FAILED DO-INSIDE CAUSING HIGH REACTOR LEVEL TURBINE TRIP AND A REACTOR TRIP.

**SCRAM** 11/10/88 LER# 32588024 50.72#: 13964 POWER: 72  
 DESC: SCRAM WHILE CONDUCTING MAIN TURBINE LOGIC TEST DUE TO AN ELECTRICAL FAULT IN THE ELECTROHYDRAULIC CONTROL SYSTEM.

**SSF** 11/15/88 LER# 32588025 50.72#: 13999 POWER: 0  
 SYSTEM: PRIMARY CONTAINMENT/UNDETERMINED SYSTEM  
 DESC: TOTAL PRIMARY CONTAINMENT LEAKRATE GREATER THAN TECH. SPEC. LIMITS. VARIOUS PRIMARY CONTAINMENT ISOLATION VALVES WOULD NOT PRESSURIZE. CAUSES UNDER INVESTIGATION.

**SSA** 11/16/88 LER# 32588026 50.72#: 14013 POWER: 0  
 DESC: DOING LOCA TESTING AND OFFSITE POWER LOSS TESTING WHEN MOMENTARY LOSS OF POWER TO UNIT 1 AND 2 COMMON EMERGENCY POWER BUS DUE TO NOT TIGHTENING A TEST AMPHENOL CAUSED DIESEL #2 TO START AND LOAD BUS.

**SE** 12/14/88 LER# 32588033 50.72#: 14228 POWER: 0  
 DESC: LICENSEE DISCOVERED SEVERAL LPCI THROTTLE & PCS ISOLATION VALVE BODIES WITH SIGNIFICANT SIGNS OF EROSION. UNIT 1 COLD SHUTDOWN, UNIT 2 IN OPERATION AT TIME OF EVENT.

**SSF** 12/14/88 LER# 32588032 50.72#: 14231 POWER: 0  
 SYSTEM: EMERGENCY/STANDBY GAS TREATMENT SYSTEM  
 DESC: BOTH STANDBY GAS TREATMENT SYSTEM TRAINS' INLET VALVES WERE DISCOVERED TO BE 5-10% OPEN. SYSTEM DECLARED INOPERABLE. FUEL MOVEMENT HAD TAKEN PLACE. DESIGN ERROR OF COMMON DAMPER INDICATION SWITCH.

**SSF** 12/14/88 LER# 32588033 50.72#: 14228 POWER: 0  
 SYSTEM: CONTAINMENT ISOLATION CONTROL SYSTEM  
 DESC: EROSION OF VALVE BODY INTERNALS IN RHR DUE TO THROTTLING BELOW DESIGN FLOW RANGE. NORMAL FLOWRATE FOR THESE VALVES WAS LESS THAN ACCIDENT FLOWRATES FOR WHICH VALVES WERE DESIGNED.



**TABLE 8.11 (CONT.)**  
**BRUNSWICK 1 (CONT.)**

**PI EVENTS FOR 88-4 (CONT.)**

**SSF** 12/16/88 LER# 32588034 50.72#: POWER: 0  
SYSTEM: SECONDARY CONTAINMENT/UNDETERMINED SYSTEM  
DESC: LOSS OF SECONDARY CONTAINMENT DURING IRRADIATED FUEL SIPPING DUE TO ISOLATION OF AIR SUPPLY TO THE REACTOR BUILDING DAMPERS. DESIGN DEFICIENCIES AND PERSONNEL ERROR.

**SSF** 12/22/88 LER# 32588035 50.72#: 14320 POWER: 0  
SYSTEM: EMERGENCY/STANDBY GAS TREATMENT SYSTEM  
DESC: A COMMON PIPE SUPPORT ON THE DISCHARGE OF THE SBGYS WAS FOUND OUTSIDE OF DESIGN BASIS. THIS RENDERS BOTH TRAINS OF THE STANDBY GAS TREATMENT SYSTEM AND SECONDARY CONTAINMENT INOPERABLE.

**PI EVENTS FOR 89-1**

**SSF** 03/13/89 LER# 32489005 50.72#: 15010 POWER: 0  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: HPCI DECLARED INOPERABLE. AN ERROR IN VENDOR SOFTWARE RESULTED IN A MOTOR ACTUATOR CLOSING TORQUE SWITCH SETPOINT BEING SET TOO LOW. THIS WOULD RESULT IN THE VALVE REACHING THE TORQUE CUTOUT SETPOINT PRIOR TO FULL CLOSURE UNDER CERTAIN CONDITIONS.

**SSF** 03/17/89 LER# 32589008 50.72#: POWER: 0  
SYSTEM: LOW PRESSURE CORE SPRAY SYSTEM  
DESC: THE CORE SPRAY AND LPCI/RHR SYSTEMS WERE UNINTENTIONALLY MADE INOPERABLE AT THE SAME TIME (6.5 HRS.). WITH LPCI/RHR OUT OF SERVICE PER LCO, THE BREAKERS ASSOCIATED WITH THE LPCS INJECTION VALVES WERE TAGGED OPEN, PERSONNEL ERROR.

**PI EVENTS FOR 89-2**

**SSF** 04/07/89 LER# 50.72#: 15239 POWER: 2  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: HPCI DECLARED INOPERABLE DUE TO STEAM LINE DELTA PRESSURE SWITCH FOUND TO BE OUT OF CALIBRATION.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.47	.00	.00	.00	.00	2.08	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	1	0	0	0	0	2	0	0
SAFETY SYSTEM ACTUATIONS	2	0	0	0	0	1	0	0
SIGNIFICANT EVENTS	1	0	1	0	1	1	0	0
SAFETY SYSTEM FAILURES	2	2	2	5	4	5	2	1
FORCED OUTAGE RATE (%)	4	0	0	0	9	5	0	26
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.47	.00	.00	.00	.49	1.04	.00	.66
CRITICAL HOURS	2125	2209	1531	2137	2031	962	0	1519
COLLECTIVE RADIATION EXPOSURE	73	70	448	65	44	316	258	NA
CAUSE CODES:								
ADMINISTRATIVE	0	1	4	2	1	4	4	NA
LICENSED OPERATOR	0	0	0	0	0	3	4	NA
OTHER PERSONNEL	3	0	1	1	2	3	1	NA
MAINTENANCE	3	2	6	2	3	10	3	NA
A) MAINT PERSONNEL	1	1	2	2	2	2	3	NA
B) SURV AND TEST	1	0	2	0	0	4	1	NA
C) EQUIPMENT	1	1	2	0	0	3	0	NA
D) POTENTIAL MAINT	0	0	2	0	1	5	0	NA
DESIGN/INSTALLATION/FABRICATION	0	1	1	3	2	4	3	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

TABLE 8.12  
BRUNSWICK 2

PI EVENTS FOR 88-3

**SE** 07/05/88 LER# 32588019 50.72#: 12721 POWER:  
DESC: POTENTIAL COMMON MODE FAILURE OF MULTIPLE HPCI (& RCIC) DC MOTOR OPERATED VALVES. BRUNSWICK 2  
LICENSED IN 1974.

**SSF** 07/05/88 LER# 32588019 50.72#: 12721 POWER: 100  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: DESIGN REVIEW INFORMATION DISCOVERED THAT THE TORQUE REQUIREMENTS WOULD EXCEED THE CAPACITY OF  
STARTING MOTORS ON HPCI INJECTION VALVES DURING DEGRADED VOLTAGE CONDITIONS. HPCI DECLARED  
INOPERABLE.

**SSF** 07/25/88 LER# 32488011 50.72#: POWER: 0  
SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
DESC: FAILURE OF A PRESSURE SWITCH RESULTED IN FAILURE OF THE RHR SUCTION VALVE TO OPEN, RHR/LPSI  
INOPERABLE.

**SSF** 07/25/88 LER# 32488012 50.72#: 12951 POWER: 0  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: THE HIGH PRESSURE COOLANT INJECTION SYSTEM WAS DECLARED INOPERABLE WHEN IT WAS DISCOVERED THAT THE EQ  
OF THE ELECTRICAL TERMINATION/SPLICES ON THE AUX OIL PUMP COULD NOT BE ASSURED. INITIAL  
CONSTRUCT.

PI EVENTS FOR 88-4

**SSA** 11/16/88 LER# 32488018 50.72#: 14007 POWER: 100  
DESC: HPCI RECEIVED INJECTION SIGNAL BUT RECEIVED A TRIP SIGNAL BEFORE INJECTION COULD OCCUR. HPCI STARTED  
MANUALLY TO CONTROL REACTOR LEVEL.

**SCRAM** 11/16/88 LER# 32488018 50.72#: 14007 POWER: 100  
DESC: TOPAZ INVERTER TO MAIN FEEDWATER CONTROL SYSTEM FAILED CAUSED A TURBINE TRIP AND A REACTOR TRIP.

**SE** 12/14/88 LER# 32588033 50.72#: 14228 POWER: 0  
DESC: LICENSEE DISCOVERED SEVERAL LPCI THROTTLE & PCS ISOLATION VALVE BODIES WITH SIGNIFICANT SIGNS OF  
EROSION. UNIT 1 COLD SHUTDOWN, UNIT 2 IN OPERATION AT TIME OF EVENT.

**SSF** 12/14/88 LER# 32588033 50.72#: 14228 POWER: 100  
SYSTEM: CONTAINMENT ISOLATION CONTROL SYSTEM  
DESC: EROSION OF VALVE BODY INTERNALS IN RHR DUE TO THROTTLING BELOW DESIGN FLOW RANGE. NORMAL FLOWRATE FOR  
THESE VALVES WAS LESS THAN ACCIDENT FLOWRATES FOR WHICH VALVES WERE DESIGNED.

**SSF** 12/22/88 LER# 32588035 50.72#: 14320 POWER: 100  
SYSTEM: EMERGENCY/STANDBY GAS TREATMENT SYSTEM  
DESC: A COMMON PIPE SUPPORT ON THE DISCHARGE OF THE SBTGS WAS FOUND OUTSIDE OF DESIGN BASIS. THIS RENDERS  
BOTH TRAINS OF THE STANDBY GAS TREATMENT SYSTEM AND SECONDARY CONTAINMENT INOPERABLE.

PI EVENTS FOR 89-1

**SSA** 02/14/89 LER# 32489001 50.72#: 14757 POWER: 100  
DESC: HPCI STARTED AND RECIRCLED TO SUPPRESSION POOL DUE TO AN ECCS START SIGNAL SUSPECTED TO BE FROM  
SPURIOUS ELECTRICAL NOISE CAUSING HPCI START.

**SSF** 02/21/89 LER# 32489002 50.72#: 14820 POWER: 100  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: THE HIGH PRESSURE COOLANT INJECTION SYSTEM WAS DECLARED INOPERABLE BECAUSE CRACKS WERE DISCOVERED IN  
TWO STEAM SUPPLY PIPING SUPPORTS. CAUSE IS BELIEVED TO BE POOR QUALITY WELDS.

**SSF** 03/13/89 LER# 32489005 50.72#: 15010 POWER: 100  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: HPCI DECLARED INOPERABLE. AN ERROR IN VENDOR SOFTWARE RESULTED IN A MOTOR ACTUATOR CLOSING TORQUE  
SWITCH SETPOINT BEING SET TOO LOW. THIS WOULD RESULT IN THE VALVE PEACHING THE TORQUE CUTOFF  
SETPOINT PRIOR TO FULL CLOSURE UNDER CERTAIN CONDITIONS.

**TABLE 8.12 (CONT.)**  
**BRUNSWICK 2 (CONT.)**

**PI EVENTS FOR 89-2**

**SSF** 04/24/89 LER# 32489006 50.72#: 15428 POWER: 100  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: WITH THE HPCI SYSTEM IN STANDBY LINEUP A HPCI HIGH STEAM FLOW ISOLATION INSTRUMENT FAILED IN THE TRIP CONDITION CAUSING ISOLATION OF THE HPCI STEAM SUPPLY INBOARD VALVE. HPCI DECLARED INOPERABLE. TRANSMITTER SENSOR MODULE DETERMINED TO HAVE FAILED.

**SSA** 06/05/89 LER# 32489008 50.72#: 15787 POWER: 100  
DESC: HPCS AND LPCI STARTED ON LOCA SIGNAL WHEN TESTING ECCS LOW-LOW-LOW LEVEL TRIP CALIBRATION UNITS.

**SSA** 06/17/89 LER# 32489009 50.72#: 15895 POWER: 75  
DESC: STARTUP AUXILIARY TRANSFORMER (SAT) LOST POWER, CAUSING LOSS OF OFF-SITE POWER CAUSING DIESEL TO START AND LOAD BUS. HPCI AND RCIC STARTED AFTER THE SCRAM.

**SSA** 06/17/89 LER# 32489009 50.72#: 15895 POWER: 75  
DESC: STARTUP AUXILIARY TRANSFORMER (SAT) LOST POWER, CAUSING LOSS OF OFF-SITE POWER CAUSING DIESEL TO START AND LOAD BUS. HPCI AND RCIC STARTED AFTER THE SCRAM.

**SE** 06/17/89 LER# 32489009 50.72#: 15895 POWER: 0  
DESC: LOSS OF OFFSITE POWER FOR APPROX 10 HOURS. ALL SAFETY SYSTEMS (INCLUDING EMERGENCY DIESEL GENERATORS) FUNCTIONED PROPERLY.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.46	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	0	0	1	0	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	1	1	3
SIGNIFICANT EVENTS	0	0	3	0	1	1	0	1
SAFETY SYSTEM FAILURES	0	1	3	3	3	2	2	1
FORCED OUTAGE RATE (%)	0	0	0	20	0	4	0	12
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	2.04	.00	.46	.00	.52
CRITICAL HOURS	2208	2209	24	1467	2001	2154	2160	1939
COLLECTIVE RADIATION EXPOSURE	73	70	448	65	44	316	258	NA
CAUSE CODES:								
ADMINISTRATIVE	0	2	5	1	1	5	1	NA
LICENSED OPERATOR	0	0	1	1	0	2	1	NA
OTHER PERSONNEL	1	2	3	0	0	4	2	NA
MAINTENANCE	3	3	11	1	3	9	4	NA
A) MAINT PERSONNEL	0	2	4	0	0	1	1	NA
B) SURV AND TEST	1	0	2	1	1	6	2	NA
C) EQUIPMENT	1	2	6	0	1	2	1	NA
D) POTENTIAL MAINT	2	0	3	0	2	2	1	NA
DESIGN/INSTALLATION/FABRICATION	0	0	2	2	4	4	2	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

TABLE 8.13

BYRON 1

PI EVENTS FOR 88-3

**SCRAM** 07/16/88 LER# 45488004 50.72#: 12863 POWER: 98  
 DESC: MFP TACHOMETER FAILED CAUSING MFP TO OVERSPEED AND TRIP CAUSING LOW SG LEVEL FF/SF MISMATCH SCRAM.

**SCRAM** 08/04/88 LER# 45488005 50.72#: 13096 POWER: 98  
 DESC: UNKNOWN OFFSITE ELECTRICAL DISTURRRANCE SIGNAL CAUSED TURBINE TRIP REACTOR TRIP.

**SE** 09/19/88 LER# 50.72#: 13487 POWER: 0  
 DESC: IMPROPERLY MONITORED REACTOR VESSEL INVENTORY RESULTED IN LOSS OF RHR WHILE IN A REFUELING OUTAGE AT MID-LOOP.

PI EVENTS FOR 88-4

NONE

PI EVENTS FOR 89-1

NONE

PI EVENTS FOR 89-2

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.41	.00	.00	.67	1.33	.00	.00	.00
SCRAMS < 15% POWER	1	0	0	0	0	0	0	0
TOTAL SCRAMS	4	0	0	1	2	0	0	0
SAFETY SYSTEM ACTUATIONS	1	0	0	0	0	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	1	0	0	0
SAFETY SYSTEM FAILURES	0	0	0	0	0	0	0	0
FORCED OUTAGE RATE (%)	6	0	0	4	4	0	1	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.47	.00	.00	.67	1.33	.00	.47	.00
CRITICAL HOURS	2129	2209	2184	1494	1499	1309	2143	2183
COLLECTIVE RADIATION EXPOSURE	11	15	4	87	156	191	66	NA
CAUSE CODES:								
ADMINISTRATIVE	1	2	0	1	1	1	2	NA
LICENSED OPERATOR	1	0	0	0	1	0	0	NA
OTHER PERSONNEL	1	1	0	0	0	0	1	NA
MAINTENANCE	4	3	1	1	5	2	3	NA
A) MAINT PERSONNEL	0	0	0	0	0	1	1	NA
B) SURV AND TEST	0	2	0	0	1	0	1	NA
C) EQUIPMENT	2	1	0	1	3	1	1	NA
D) POTENTIAL MAINT	3	1	1	1	3	1	0	NA
DESIGN/INSTALLATION/FABRICATION	0	0	0	0	0	0	0	NA
EQUIPMENT FAILURE	0	0	0	0	2	0	1	NA

TABLE 8.14

BYRON 2

PI EVENTS FOR 88-3

**SCRAM** 07/14/88 LER# 45588008 50.72#: 12821 POWER: 95  
DESC: OPERATOR SHIFTED POWER FROM UNIT AUXILIARY TRANSFORMER TO STARTUP TRANSFORMER INCORRECTLY CAUSING LOSS OF MFP'S AND SUBSEQUENT SCRAM ON LOW SG LEVELS.

**SCRAM** 07/15/88 LER# 45588009 50.72#: 12836 POWER: 4  
DESC: 2 MAIN FEEDWATER BYPASS VALVES FAILED TO OPEN CAUSING NO FEED FLOW TO SG CAUSING SCRAM.

PI EVENTS FOR 88-4

**SCRAM** 12/15/88 LER# 45588012 50.72#: 14251 POWER: 40  
DESC: CLEANING BORIC ACID FROM RCS LOOP PRESSURE INSTRUMENT VALVE CAUSED LOW LOOP FLOW SIGNAL SCRAM.

PI EVENTS FOR 89-1

**SE** 01/16/89 LER# 50.72#: POWER: 0  
DESC: INCORRECT PROCEDURE ALLOWED COMBUSTIBLE GAS MIXTURE TO FILL THE ACCUMULATOR. (MORNING REPORT: 01/23/89)

**SSA** 02/11/89 LER# 45589001 50.72#: 14733 POWER: 0  
DESC: INADEQUATE PROCEDURE DURING LOAD SEQUENCE TEST CAUSED SI AND DIESEL AUTO START DUE TO SEQUENCER DEENERGIZING.

PI EVENTS FOR 89-2

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.51	.64	.46	.47	.46	.46	.00	.00
SCRAMS < 15% POWER	0	1	0	0	1	0	0	0
TOTAL SCRAMS	1	2	1	1	2	1	0	0
SAFETY SYSTEM ACTUATIONS	1	2	0	0	0	0	1	0
SIGNIFICANT EVENTS	0	1	0	0	0	0	1	0
SAFETY SYSTEM FAILURES	0	0	0	0	0	0	0	0
FORCED OUTAGE RATE (%)	22	4	1	4	2	1	0	8
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	1.54	1.29	.46	1.40	.92	.46	.00	.49
CRITICAL HOURS	1947	1551	2170	2141	2171	2194	806	2021
COLLECTIVE RADIATION EXPOSURE	NA	NA	NA	NA	NA	NA	66	NA
CAUSE CODES:								
ADMINISTRATIVE	3	2	0	3	1	1	2	NA
LICENSED OPERATOR	2	0	0	2	1	0	1	NA
OTHER PERSONNEL	3	3	2	1	1	1	0	NA
MAINTENANCE	8	3	3	4	6	2	1	NA
A) MAINT PERSONNEL	0	1	0	0	0	2	0	NA
B) SURV AND TEST	4	2	2	1	2	0	1	NA
C) EQUIPMENT	6	0	1	2	4	1	1	NA
D) POTENTIAL MAINT	4	0	2	3	3	0	0	NA
DESIGN/INSTALLATION/FABRICATION	0	0	2	0	0	0	1	NA
EQUIPMENT FAILURE	1	0	0	1	2	0	0	NA

TABLE 8.15

CALLAWAY

PI EVENTS FOR 88-3

**SCRAM** 09/02/88 LER# 48388010 50.72#: 13358 POWER: 100  
 DESC: DURING OPERATOR TRAINING, A POTENTIAL TRANSFORMER DOOR WAS OPENED WHICH DISCONNECTED FUSES CAUSED LOSS OF 4160 V BUS TRIPPING CONDENSATE PUMPS AND HEATER DRAIN PUMPS CAUSING LOSS OF MAIN FEEDWATER.

PI EVENTS FOR 88-4

**SBF** 10/29/88 LER# 48388013 50.72#: POWER: 100  
 SYSTEM: ENGINEERED SAFETY FEATURES ACTUATION SYSTEM  
 DESC: INSTRUMENT AND CONTROL TERMINATIONS FAILED TO MEET EQ REQUIREMENTS: VARIOUS ESF SYSTEMS, RPS, ACCIDENT MONITORING, REMOTE SHUTDOWN MONITORING. INSTRUMENTS DECLARED INOPERABLE.

**SSA** 11/16/88 LER# 48388015 50.72#: 14015 POWER: 100  
 DESC: RACKING IN BREAKER WHEN ADJACENT BREAKER OPENED CAUSING LOSS OF OFFSITE POWER TO SAFEGUARDS BUS NB01, DIESEL STARTED AND LOADED BUS.

PI EVENTS FOR 89-1

NONE

PI EVENTS FOR 89-2

**SSA** 05/18/89 LER# 48389005 50.72#: 15638 POWER: 0  
 DESC: OPERATOR TURNED SHUNT TRIP CIRCUITRY SWITCH ON REACTOR TRIP BREAKER IN THE WRONG DIRECTION DURING SURVEILLANCE CAUSING A SI SIGNAL, RE STATES 180 GALLONS INJECTED, LER STATES NO SI OCCURRED DUE TO SI BEING IN BLOCK.

**SSA** 05/18/89 LER# 48389005 50.72#: 15638 POWER: 0  
 DESC: OPERATOR PRESSED WRONG BUTTON WHILE RECOVERING FROM ABOVE SSA CAUSING SECOND SI SIGNAL. RE STATES 180 GALLONS INJECTED, LER STATES NO SI OCCURRED DUE TO SI BEING IN BLOCK.

**SCRAM** 05/29/89 LER# 48389006 50.72#: 15740 POWER: 97  
 DESC: WHILE PREPARING FOR SURVEILLANCE AND INCORE/EXCORE CALIBRATION, TECHNICIAN DROPPED A LEAD CAUSING A GROUND AND FALSE HIGH RATE SCRAM SIGNAL.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.96	.53	.46	.00	.00	1.08
SCRAMS < 15% POWER	0	1	0	1	0	0	0	0
TOTAL SCRAMS	0	1	2	2	1	0	0	1
SAFETY SYSTEM ACTUATIONS	0	2	1	0	0	1	0	2
SIGNIFICANT EVENTS	1	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	3	2	1	0	0	1	0	0
FORCED OUTAGE RATE (%)	0	5	6	5	1	0	0	3
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.89	.00	1.59	.00	.00	.00	1.08
CRITICAL HOURS	1724	1126	2078	1883	2187	2055	2138	927
COLLECTIVE RADIATION EXPOSURE	101	154	3	5	6	13	6	NA
CAUSE CODES:								
ADMINISTRATIVE	7	2	2	1	1	2	0	NA
LICENSED OPERATOR	0	2	2	2	1	1	1	NA
OTHER PERSONNEL	2	1	2	0	1	1	1	NA
MAINTENANCE	7	3	2	3	3	2	2	NA
A) MAINT PERSONNEL	1	0	1	1	1	1	0	NA
B) SURV AND TEST	4	2	1	1	2	1	1	NA
C) EQUIPMENT	2	2	1	1	2	0	1	NA
D) POTENTIAL MAINT	2	2	0	1	0	0	1	NA
DESIGN/INSTALLATION/FABRICATION	2	0	1	0	1	1	1	NA
EQUIPMENT FAILURE	0	0	1	1	1	0	0	NA

**TABLE 8.16  
CALVERT CLIFFS 1**

**PI EVENTS FOR 88-3**

**SCRAM** 07/15/88 LER# 31788006 50.72#: 12835 POWER: 89  
DESC: MAINTENANCE PERSONNEL, FOLLOWING AN UNCLEAR PROCEDURE, ISOLATED THE FEED HEATER LEVEL SWITCH CAUSING A TURBINE TRIP AND A REACTOR TRIP.

**SCRAM** 08/24/88 LER# 31788009 50.72#: 13278 POWER: 100  
DESC: VIBRATION CAUSED A FITTING ON AIR LINE TO FRV TO FAIL CAUSING FRV TO FAIL OPEN RESULTING IN A HIGH SG LEVEL SCRAM.

**PI EVENTS FOR 88-4**

NONE

**PI EVENTS FOR 89-1**

**SSA** 03/19/89 LER# 31789003 50.72#: 15059 POWER: 0  
DESC: A LICENSED OPERATOR MISSED A STEP IN A SURVEILLANCE TEST PROCEDURE TO BLOCK THE PRESSURIZER LOW PRESSURE TRIP CAUSING A SAFETY INJECTION.

**SSA** 03/20/89 LER# 31789004 50.72#: 15070 POWER: 0  
DESC: ESFAS LOGIC SIGNAL WHEN OPERATOR MISSED TWO STEPS IN PROCEDURE THEN TRIED TO RETURN TO NORMAL CAUSING 4 HPSI HEADER MOV'S TO OPEN.

**SSF** 03/24/89 LER# 31789005 50.72#: 15111 POWER: 0  
SYSTEM: ULTIMATE HEAT SINK SYSTEM  
DESC: POTENTIAL FOR A LOSS OF THE ULTIMATE HEAT SINK SYSTEM DUE TO A LOSS OF INSTRUMENT AIR. WHILE PERFORMING A TEST PROCEDURE TO IDENTIFY AIR SYSTEM LEAKAGE, A BOUNDARY CHECK VALVE WAS FOUND LEAKING. DESIGN REVIEW FOUND THE VALVE INCORRECT FOR APPLICATION

**PI EVENTS FOR 89-2**

**SSF** 05/08/89 LER# 31789008 50.72#: 15576 POWER: 0  
SYSTEM: ULTIMATE HEAT SINK SYSTEM  
DESC: POTENTIAL FOR LOSS OF COOLING TO THE ESW AND CCW SYSTEMS DUE TO POSSIBLE LOSS OF INSTRUMENT AIR TO VALVES CAUSING PUMP RUNOUT. REPRESENTS ULTIMATE HEAT SINK. THE SAFETY RELATED AIR TUBING TO THE VALVES DID NOT MEET DESIGN BASIS SEISMIC MOUNTING REQMT

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.61	.50	.00	.00	.94	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	3	1	0	0	2	0	0	0
SAFETY SYSTEM ACTUATIONS	1	0	0	4	0	0	2	0
SIGNIFICANT EVENTS	1	0	0	1	0	0	0	0
SAFETY SYSTEM FAILURES	0	0	0	0	0	0	1	1
FORCED OUTAGE RATE (%)	16	11	1	0	4	2	4	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	1.07	.50	.00	.00	.47	1.06	1.37	.00
CRITICAL HOURS	1866	1983	2184	194	2139	1881	1455	352
COLLECTIVE RADIATION EXPOSURE	20	17	19	105	9	12	20	NA
CAUSE CODES:								
ADMINISTRATIVE	0	1	0	1	1	2	3	NA
LICENSED OPERATOR	2	0	0	0	2	0	2	NA
OTHER PERSONNEL	2	0	0	4	2	1	1	NA
MAINTENANCE	2	2	0	4	1	3	4	NA
A) MAINT PERSONNEL	2	0	0	4	1	2	2	NA
B) SURV AND TEST	0	1	0	0	0	1	3	NA
C) EQUIPMENT	0	1	0	1	0	0	0	NA
D) POTENTIAL MAINT	0	1	0	0	0	0	0	NA
DESIGN/INSTALLATION/FABRICATION	3	0	0	0	2	2	1	NA
EQUIPMENT FAILURE	0	1	0	0	0	0	0	NA

**TABLE 8.17  
CALVERT CLIFFS 2**

**PI EVENTS FOR 88-3**

NONE

**PI EVENTS FOR 88-4**

NONE

**PI EVENTS FOR 89-1**

**SE** 03/01/87 LER# 50.72#: 14893 POWER: 0  
DESC: TURBINE DRIVEN AUXILIARY FEED PUMP THROTTLE TRIP VALVE FAILURE WITH RESULTING CONTROL ROOM FIRE.

**PI EVENTS FOR 89-2**

**SE** 05/05/89 LER# 50.72#: 15540 POWER: 0  
DESC: BORIC ACID BUILDUP ON PRESSURIZER HEATERS ON BOTTOM OF PRESSURIZER.

**SSF** 05/08/89 LER# 31789008 50.72#: 15576 POWER: 0  
SYSTEM: ULTIMATE HEAT SINK SYSTEM  
DESC: POTENTIAL FOR LOSS OF COOLING TO THE ESW AND CCW SYSTEMS DUE TO POSSIBLE LOSS OF INSTRUMENT AIR TO VALVES CAUSING PUMP RUNOUT. REPRESENTS ULTIMATE HEAT SINK. THE SAFETY RELATED AIR TUBING TO THE VALVES DID NOT MEET DESIGN BASIS SEISMIC MOUNTING REQMT

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.47	.48	.74	.49	.00	.00	.00	.00
SCRAMS < 15% POWER	1	0	0	0	0	0	0	0
TOTAL SCRAMS	2	1	1	1	0	0	0	0
SAFETY SYSTEM ACTUATIONS	1	0	0	0	0	0	0	0
SIGNIFICANT EVENTS	1	0	0	1	0	0	1	1
SAFETY SYSTEM FAILURES	0	0	0	0	0	0	0	1
FORCED OUTAGE RATE (%)	5	6	1	6	0	0	11	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.94	1.43	.00	.49	.00	.00	.57	.00
CRITICAL HOURS	2121	2104	1358	2052	2208	2209	1766	0
COLLECTIVE RADIATION EXPOSURE	20	17	19	105	9	12	20	NA
CAUSE CODES:								
ADMINISTRATIVE	1	1	1	0	1	0	5	NA
LICENSED OPERATOR	1	0	0	1	1	0	1	NA
OTHER PERSONNEL	0	2	0	1	1	0	2	NA
MAINTENANCE	1	2	3	1	1	0	5	NA
A) MAINT PERSONNEL	0	2	2	0	0	0	3	NA
B) SURV AND TEST	1	0	0	1	1	0	3	NA
C) EQUIPMENT	0	1	2	0	0	0	1	NA
D) POTENTIAL MAINT	0	0	2	0	0	0	0	NA
DESIGN/INSTALLATION/FABRICATION	2	1	1	1	0	1	0	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA



**TABLE 8.18**

**CATAWBA 1**

**PI EVENTS FOR 88-3**

**NONE**

**PI EVENTS FOR 88-4**

**SSF** 10/25/88 LER# 41388023 50.72#: POWER: 95  
 SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
 DESC: BOTH TRAINS OF CONTROL ROOM VENTILATION INOPERABLE DUE TO DESIGN DEFICIENCY OF THE COOLING WATER FLOW CONTROL VALVE.

**SSF** 12/30/88 LER# 41388027 50.72#: POWER: 0  
 SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
 DESC: RHR FLOW WAS BELOW TECH. SPEC. LIMITS APPROXIMATELY 53.5 HOURS. RCS LEVEL WAS LOWERED TO FACILITATE REMOVAL OF S/G NOZZLE DAMS. TO PREVENT RHR LOSS OF PUMP SUCTION FLOW WAS REDUCED. PROCEDURE ERROR.

**PI EVENTS FOR 89-1**

**SSA** 01/07/89 LER# 41389012 50.72#: 14436 POWER: 0  
 DESC: 6900 BREAKER OPENED AND CAUSED LOSS OF POWER TO ESSENTIAL BUS 'A'. THE DIESEL GENERATOR "1A" WAS OUT OF SERVICE FOR MAINTENANCE. BREAKER OPENED DURING RCP STARTING BECAUSE WRONG TYPE RELAY WAS INSTALLED.

**SSA** 03/05/89 LER# 41389008 50.72#: 14940 POWER: 100  
 DESC: OPERATOR SHUT 'A' MSIV INSTEAD OF MAIN STEAM PORV RELIEF VALVE DURING TESTING CAUSING A SAFETY INJECTION ON LOW MAIN STEAMLINE PRESSURE. DIESEL GENERATORS ALSO STARTED.

**SCRAM** 03/05/89 LER# 41389008 50.72#: 14940 POWER: 100  
 DESC: OPERATOR SHUT 'A' MSIV INSTEAD OF 'A' MAIN STEAM PORV RELIEF VALVE (RIGHT BESIDE EACH OTHER) CAUSING A REACTOR TRIP ON OVER POWER DELTA TEMPERATURE.

**SSF** 03/31/89 LER# 41389010 50.72#: 15175 POWER: 100  
 SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
 DESC: BOTH TRAINS OF THE CONTROL ROOM EMERGENCY VENTILATION SYSTEM DECLARED INOPERABLE. ONE TRAIN HAD BEEN OOS FOR MAINTENANCE WHEN THE OTHER TRAIN FAILED DUE TO A FAILED BEARING ON AN AHU MOTOR. BOTH UNITS AFFECTED.

**PI EVENTS FOR 89-2**

**NONE**

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.49	.00	.00	.00	.00	.00	.78	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	1	0	0	0	0	0	1	0
SAFETY SYSTEM ACTUATIONS	0	1	1	0	0	0	2	0
SIGNIFICANT EVENTS	0	0	0	2	0	0	0	0
SAFETY SYSTEM FAILURES	0	1	2	0	0	2	1	0
FORCED OUTAGE RATE (%)	9	90	15	0	16	0	9	6
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	1.48	8.77	1.05	.00	1.19	.00	3.10	.99
CRITICAL HOURS	2030	114	1898	2183	1681	1308	1289	2020
COLLECTIVE RADIATION EXPOSURE	208	356	141	8	30	98	79	NA

**CAUSE CODES:**

ADMINISTRATIVE	6	5	7	2	1	2	3	NA
LICENSED OPERATOR	0	1	3	0	0	0	2	NA
OTHER PERSONNEL	1	3	5	1	1	1	4	NA
MAINTENANCE	6	6	9	1	1	4	8	NA
A) MAINT PERSONNEL	1	2	4	0	1	1	4	NA
B) SURV AND TEST	4	1	5	1	1	1	1	NA
C) EQUIPMENT	4	4	2	0	0	1	4	NA
D) POTENTIAL MAINT	4	2	2	0	1	2	2	NA
DESIGN/INSTALLATION/FABRICATION	4	2	5	3	0	3	4	NA
EQUIPMENT FAILURE	0	1	2	0	0	0	0	NA

**TABLE 8.19**

**CATAWBA 2**

**PI EVENTS FOR 88-3**

**NONE**

**PI EVENTS FOR 88-4**

**SSF** 10/25/88 LER# 41388023 50.72#: POWER: 95  
 SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
 DESC: BOTH TRAINS OF CONTROL ROOM VENTILATION INOPERABLE DUE TO DESIGN DEFICIENCY OF THE COOLING WATER FLOW CONTROL VALVE.

**PI EVENTS FOR 89-1**

**SCRAM** 01/12/89 LER# 41489001 50.72#: 14481 POWER: 95  
 DESC: BLOWN FUSE, DUE TO A MANUFACTURING DEFICIENCY, IN FRV CAUSED FRV TO FAIL CLOSED RESULTING IN A LOW SG LEVEL SCRAM.

**SSA** 02/21/89 LER# 41489003 50.72#: 14808 POWER: 94  
 DESC: SAFETY INJECTION WHEN MSIV'S WENT <90% OPEN DURING TESTING CAUSING LOW STEAMLINE PRESSURE SCRAM AND SAFETY INJECTION. MSIV'S CLOSED WHEN A TECHNICIAN JUMPED A SET OF CONTACTS CAUSING A SHORT CIRCUIT.

**SSA** 02/21/89 LER# 41489004 50.72#: 14817 POWER: 0  
 DESC: LOW STEAMLINE PRESSURE SETPOINT WAS REACHED WHILE COOLING DOWN CAUSING SAFETY INJECTION AND SYSTEM ISOLATIONS. THE ESSENTIAL SERVICE WATER AND CLOSED COMPONENT COOLING WATER SYSTEMS STARTED.

**SCRAM** 02/21/89 LER# 41489003 50.72#: 14808 POWER: 94  
 DESC: LOW STEAMLINE PRESSURE WHEN MSIV'S WENT <90% OPEN CAUSING SCRAM.

**SSF** 03/31/89 LER# 41389010 50.72#: 15175 POWER: 0  
 SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
 DESC: BOTH TRAINS OF THE CONTROL ROOM EMERGENCY VENTILATION SYSTEM DECLARED INOPERABLE. ONE TRAIN HAD BEEN OOS FOR MAINTENANCE WHEN THE OTHER TRAIN FAILED DUE TO A FAILED BEARING ON AN AHU MOTOR. BOTH UNITS AFFECTED.

**PI EVENTS FOR 89-2**

**NONE**

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.32	.00	2.65	1.60	.00	.00	1.31	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	2	0	1	3	0	0	2	0
SAFETY SYSTEM ACTUATIONS	0	0	2	0	0	0	2	0
SIGNIFICANT EVENTS	0	0	1	1	0	0	0	0
SAFETY SYSTEM FAILURES	0	1	1	1	0	1	1	0
FORCED OUTAGE RATE (%)	34	6	60	7	8	3	9	18
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	3.30	.52	5.29	3.20	1.44	1.39	3.28	.00
CRITICAL HOURS	1514	1923	378	1875	2080	2164	1526	505
COLLECTIVE RADIATION EXPOSURE	NA	NA	141	8	30	98	79	NA
CAUSE CODES:								
ADMINISTRATIVE	6	6	10	6	2	3	6	NA
LICENSED OPERATOR	3	1	4	3	0	0	2	NA
OTHER PERSONNEL	4	5	7	4	2	1	3	NA
MAINTENANCE	7	6	15	12	3	7	9	NA
A) MAINT PERSONNEL	4	4	4	5	2	2	2	NA
B) SURV AND TEST	2	2	6	3	1	2	4	NA
C) EQUIPMENT	2	3	6	5	2	4	1	NA
D) POTENTIAL MAINT	3	2	4	3	2	3	3	NA
DESIGN/INSTALLATION/FABRICATION	2	1	5	4	0	3	4	NA
EQUIPMENT FAILURE	0	0	1	1	0	0	0	NA

**TABLE 8.20**

**CLINTON 1**

**PI EVENTS FOR 88-3**

**SSA** 09/01/88 LER# 46188022 50.72#: 13351 POWER: 100  
DESC: HPCS ACTUATED AND INJECTED WHEN RETURNING LEVEL TRANSMITTER TO SERVICE DUE TO DESIGN OF PRESSURE TRANSMITTER.

**PI EVENTS FOR 88-4**

**SSF** 10/26/88 LER# 46188024 50.72#: 13818 POWER: 93  
SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
DESC: BOTH TRAINS OF THE CONTROL ROOM EMERGENCY VENTILATION SYSTEM INOP. DUE TO UNRELATED EQUIPMENT FAILURES. ONE TRAIN WAS INOPERABLE, OTHER TRAIN DAMPER FAILED, PERSONNEL DID NOT RECOGNIZE INOPERABILITY.

**SSF** 11/09/88 LER# 46188026 50.72#: POWER: 87  
SYSTEM: SECONDARY CONTAINMENT/UNDETERMINED SYSTEM  
DESC: LOSS OF SECONDARY CONTAINMENT INTEGRITY DUE TO FAILURE TO PROVIDE A PROGRAM FOR MAINTAINING LOOP SEAL DRAIN TRAPS OPERABLE.

**SSF** 11/10/88 LER# 46188027 50.72#: POWER: 87  
SYSTEM: HIGH PRESSURE CORE SPRAY SYSTEM  
DESC: DIVISION III DIESEL GENERATOR PROVIDES POWER TO HPCS. A METAL DISK INSTALLED IN THE EXHAUST FLOW PATH COULD HAVE CAUSED EXCESSIVE BACK PRESSURE TO DAMAGE THE DG, AND LOSS OF HPCS. HPCS DECLARED INOPERABLE.

**SCRAM** 11/11/88 LER# 46188028 50.72#: 13970 POWER: 88  
DESC: FIRE IN MAIN TRANSFORMER '1C' DUE TO AN INTERNAL FAULT CAUSED GENERATOR TRIP SCRAM.

**SE** 11/14/88 LER# 50.72#: 13970 POWER: 0  
DESC: LOSS OF RESERVE TRANSFORMER AND LOSS OF MAIN TRANSFORMER.

**PI EVENTS FOR 89-1**

**SSF** 01/05/89 LER# 46189001 50.72#: 14416 POWER: 0  
SYSTEM: MAIN STEAM ISOLATION VALVES  
DESC: FIVE MSIVS FAILED THEIR LEAK RATE TEST. TWO OF THE LINES HAD FAILURE OF BOTH INBOARD AND OUTBOARD VALVES. CAUSE ATTRIBUTED TO WEAR RESULTING IN ANOMALIES OF THE SEATING AREAS OF VALVES.

**SSF** 03/01/89 LER# 46189017 50.72#: POWER: 0  
SYSTEM: HIGH PRESSURE CORE SPRAY SYSTEM  
DESC: DURING A WALKDOWN BY A DG SYSTEMS ENGINEER, THE MOUNTING HARDWARE FOR THE DIV. III DIESEL GENERATOR DG/SX HEAT EXCHANGER WAS FOUND TO BE OUTSIDE DESIGN. THE DIV. III DG AND THE HPCS SYSTEM (DIV III DG LOAD) WERE BOTH DECLARED INOPERABLE.

**PI EVENTS FOR 89-2**

**SSF** 04/14/89 LER# 46189019 50.72#: POWER: 0  
SYSTEM: INSTRUMENT AND UNINTERRUPTIBLE POWER SYSTEM - CLASS 1E  
DESC: 13 ISSUES RELATIVE TO EQ OF ELECTRICAL EQUIP. WERE IDENTIFIED. SYSTEMS AND COMPONENTS: COMBUSTIBLE GAS CONTROL, MSIVS, SBTGS, ECCS, RCIC, INSTRUMENTATION TERMINAL STRIPS, RHR, DRYWELL VACUUM RELIEF. POTENTIAL FOR SOME SYSTEMS TO NOT FULFILL SAFETY FUNCTION.

**SE** 06/01/89 LER# 50.72#: 15761 POWER: 0  
DESC: REBUILT INBOARD AND OUTBOARD SEALS FAILED ON A RECIRCULATION PUMP.

**SCRAM** 06/28/89 LER# 46189028 50.72#: 15975 POWER: 100  
DESC: HIGH TRANSFORMER OIL PRESSURE CAUSED A MAIN GENERATOR TRIP, FAST CLOSURE OF THE TURBINE CONTROL VALVES WHICH CAUSED A REACTOR SCRAM.

TABLE D.20 (CONT.)

CLINTON 1 (CONT.)

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	2.67	.85	.00	.71	.00	.52	.00	2.35
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	5	1	0	1	0	1	0	1
SAFETY SYSTEM ACTUATIONS	0	1	0	0	1	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	1	0	1
SAFETY SYSTEM FAILURES	3	3	1	3	0	3	2	1
FORCED OUTAGE RATE (%)	NA	0	0	10	2	15	0	69
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	NA	3.41	2.67	.71	.45	1.03	.00	4.69
CRITICAL HOURS	1870	1173	1875	1407	2171	1936	51	426
COLLECTIVE RADIATION EXPOSURE	NA	NA	NA	NA	NA	NA	260	NA
CAUSE CODES:								
ADMINISTRATIVE	8	5	2	4	1	4	9	NA
LICENSED OPERATOR	6	1	1	2	0	1	4	NA
OTHER PERSONNEL	8	5	2	3	3	3	3	NA
MAINTENANCE	22	8	8	7	5	7	10	NA
A) MAINT PERSONNEL	2	3	1	2	3	3	1	NA
B) SURV AND TEST	17	4	4	4	1	3	8	NA
C) EQUIPMENT	3	2	5	6	2	1	2	NA
D) POTENTIAL MAINT	2	1	4	0	1	1	0	NA
DESIGN/INSTALLATION/FABRICATION	2	2	1	1	1	1	3	NA
EQUIPMENT FAILURE	2	0	0	1	0	1	0	NA

**TABLE 8.21**

**COOK 1**

**PI EVENTS FOR 88-3**

**SSF** 09/07/88 LER# 31588006 50.72#: POWER: 0  
 SYSTEM: CONTAINMENT COMBUSTIBLE GAS CONTROL SYSTEM  
 DESC: FOUR HYDROGEN SKIMMING DAMPERS WERE FOUND TO BE MISPOSITIONED COMBUSTIBLE GAS CONTROL SYSTEM SUCH THAT HYDROGEN CONCENTRATION COULD HAVE EXCEEDED 4% LIMIT. CAUSED BY PERSONNEL ERROR.

**SE** 09/09/88 LER# 31588007 50.72#: POWER:  
 DESC: FAILURE OF STUDS ON ANCHOR DARTING CHECK VALVES. COOK 2 LICENSED IN 1977. (MORNING REPORT: 10/17/88)

**PI EVENTS FOR 88-4**

**SSF** 10/11/88 LER# 31588010 50.72#: POWER: 90  
 SYSTEM: REACTOR COOLANT SYSTEM  
 DESC: CABLES FOR THE PZR AND PRESSURE VENT VALVES NOT CONFIGURED PER DES. W. VENTS DESIGNED TO MITIGATE POSSIBLE CONDITION OF INADEQUATE CORE COOLING, NATURAL CIRCULATION, OR AN INABILITY TO DEPRESSURIZE RCS

**SCRAM** 10/19/88 LER# 31588011 50.72#: 13760 POWER: 90  
 DESC: AN INDICATING LIGHT SOCKET SHORTING OUT AND CAUSED A FUSE TO BLOW RESULTED IN A SENSED LOSS OF LOOP FLOW WHICH CAUSED A REACTOR SCRAM.

**SCRAM** 11/23/88 LER# 31588013 50.72#: 14077 POWER: 90  
 DESC: A SPURIOUS BUS UNDERFREQUENCY CONDITION CAUSED ALL THREE REACTOR COOLANT PUMP BREAKERS TO OPEN RESULTING IN A REACTOR TRIP ON LOW COOLANT FLOW.

**PI EVENTS FOR 89-1**

**SCRAM** 01/16/89 LER# 31589001 50.72#: 14510 POWER: 71  
 DESC: OPERATOR OPENED AIR OFFTAKES ON STARTUP AIR EJECTORS CAUSING LOSS OF CONDENSOR VACUUM TURBINE TRIP SCRAM.

**SCRAM** 03/18/89 LER# 31589003 50.72#: 15049 POWER: 10  
 DESC: IRM BISTABLE OUT OF CALIBRATION CAUSED SCRAM WHEN POWER REDUCED BELOW 10% POWER.

**PI EVENTS FOR 89-2**

**NONE**

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.43	.47	.00	.00	.95	.55	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	1	0
TOTAL SCRAMS	0	1	1	0	0	2	2	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	0	0
SIGNIFICANT EVENTS	1	1	0	0	1	0	0	0
SAFETY SYSTEM FAILURES	2	0	0	0	1	1	0	0
FORCED OUTAGE RATE (%)	0	1	1	0	0	6	1	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.48	.00	.00	.00	.95	.00	.00
CRITICAL HOURS	0	2104	2131	2183	2010	2109	1810	0
COLLECTIVE RADIATION EXPOSURE	203	24	7	109	184	74	95	NA
CAUSE CODES:								
ADMINISTRATIVE	5	3	1	2	4	2	2	NA
LICENSED OPERATOR	2	0	1	0	0	0	1	NA
OTHER PERSONNEL	1	0	0	0	3	1	1	NA
MAINTENANCE	8	3	4	2	5	4	5	NA
A) MAINT PERSONNEL	1	0	0	0	2	1	0	NA
B) SURV AND TEST	5	2	2	2	3	1	2	NA
C) EQUIPMENT	2	1	2	0	0	2	3	NA
D) POTENTIAL MAINT	1	1	0	0	0	2	0	NA
DESIGN/INSTALLATION/FABRICATION	1	2	0	0	2	1	1	NA
EQUIPMENT FAILURE	1	0	0	0	0	1	0	NA

TABLE 8.22

COOK 2

PI EVENTS FOR 88-3

SE 09/09/88 LER# 50.72#: POWER:  
 DESC: FAILURE OF STUDS ON ANCHOR DARLING CHECK VALVES. COOK 2 LICENSED IN 1977. (MORNING REPORT: 10/17/88)

PI EVENTS FOR 88-4

SSF 10/11/88 LER# 31588010 50.72#: POWER: 0  
 SYSTEM: REACTOR COOLANT SYSTEM  
 DESC: CABLES FOR THE PZR AND VESSEL VENT VALVES NOT CONFIGURED PER DESIGN. VENTS DESIGNED TO MITIGATE POSSIBLE CONDITION OF INADEQUATE CORE COOLING, NATURAL CIRCULATION, OR AN INABILITY TO DEPRESSURIZE RCS

PI EVENTS FOR 89-1

NONE

PI EVENTS FOR 89-2

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.73	.00	.00	.00	.00	.00	.00	.00
SCRAMS < 15% POWER	0	1	0	0	0	0	0	0
TOTAL SCRAMS	2	1	0	0	0	0	0	0
SAFETY SYSTEM ACTUATIONS	1	1	0	0	0	0	0	0
SIGNIFICANT EVENTS	1	0	0	0	1	0	0	0
SAFETY SYSTEM FAILURES	0	0	0	1	0	1	0	0
FORCED OUTAGE RATE (%)	48	11	0	0	0	0	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	2.59	.00	.00	.00	.00	.00	.00	.00
CRITICAL HOURS	1158	1974	2184	532	0	0	395	1863
COLLECTIVE RADIATION EXPOSURE	203	24	7	109	184	74	95	NA
CAUSE CODES:								
ADMINISTRATIVE	3	3	1	2	3	3	2	NA
LICENSED OPERATOR	1	1	0	0	0	0	2	NA
OTHER PERSONNEL	0	4	0	0	1	1	3	NA
MAINTENANCE	6	7	2	3	3	3	8	NA
A) MAINT PERSONNEL	0	2	0	0	1	1	2	NA
B) SURV AND TEST	3	4	1	2	2	2	2	NA
C) EQUIPMENT	4	2	1	1	0	0	4	NA
D) POTENTIAL MAINT	3	2	0	0	0	0	0	NA
DESIGN/INSTALLATION/FABRICATION	1	2	0	1	2	1	2	NA
EQUIPMENT FAILURE	2	0	0	0	0	0	0	NA

**TABLE 2.23  
COOPER STATION**

**PI EVENTS FOR 88-3**

**SSA** 08/25/88 LER# 29888021 50.72#: 13279 POWER: 100  
DESC: AUTO START OF HPCI AND RCIC WITH NO INJECTION, LEVEL MANUALLY CONTROLLED WITH HPCI AND RCIC TO MAINTAIN WATER LEVEL.

**SCRAM** 08/25/88 LER# 29888021 50.72#: 13279 POWER: 100  
DESC: SPURIOUS HIGH MAIN STEAM LINE RADIATION SIGNAL POSSIBLY DUE TO ELECTRICAL NOISE CAUSED REACTOR SCRAM.

**SSF** 08/27/88 LER# 29888022 50.72#: POWER: 10  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: HPCI FAILED TO REACH RATED FLOW WITHIN TIME REQUIRED DURING SURVEILLANCE TEST. FAILED EGM BOX

**SSA** 09/30/88 LER# 29888026 50.72#: 13589 POWER: 100  
DESC: UNDERVOLTAGE CONDITION ON EMERGENCY TRANSFORMER FOR ABOUT 2-SECONDS CAUSED DIESEL START.

**PI EVENTS FOR 88-4**

NONE

**PI EVENTS FOR 89-1**

**SCRAM** 01/25/89 LER# 29889001 50.72#: 14570 POWER: 100  
DESC: APRM HIGH TRIP SIGNAL DUE TO A FAILED DISC (DISC CAME LOOSE FROM STEM) ON A MSIV SEATING CAUSING A PRESSURE SPIKE AND HIGH NEUTRON FLUX SIGNAL SCRAM.

**SSF** 02/16/89 LER# 29889004 50.72#: POWER: 61  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: BOTH DIESEL GENERATORS WERE INOPERABLE AT THE SAME TIME. THE "B" EDG WAS OUT OF SERVICE FOR MAINTENANCE WHEN THE "A" EDG OVERSPEED TRIP VALVE WAS ACCIDENTLY TRIPPED WHICH WOULD HAVE PREVENTED THE EDG, WHICH WAS IN STANDBY, FROM STARTING IF NEEDED.

**SSF** 02/17/89 LER# 29889010 50.72#: 14781 POWER: 100  
SYSTEM: REACTOR BUILDING ENVIRONMENTAL CONTROL SYSTEM  
DESC: THE NRC SSFI TEAM FOUND THAT LOSS OF A NONESSENTIAL SERVICE AIR SYSTEM SUPPLY TO THE DIESEL GENERATOR HEV SYSTEM AND DG COOLING WATER BYPASS VALVES COULD CAUSE THE DIESEL GENERATORS TO SHUTDOWN DUE TO ROOM OVERTEMPERATURE.

**SSF** 02/17/89 LER# 29889006 50.72#: 14782 POWER: 100  
SYSTEM: REACTOR BUILDING ENVIRONMENTAL CONTROL SYSTEM  
DESC: THE NRC SSFI TEAM FOUND THAT SINCE THE HVAC SYSTEM WAS A NON-ESSENTIAL SYSTEM ITS PROBABLE LOSS DURING CERTAIN DESIGN BASIS ACCIDENTS WOULD RESULT IN LOSS OF ESSENTIAL ELECTRICAL SUPPLY SWITCHGEAR TO ECCS LOADS.

**SSF** 02/17/89 LER# 29889005 50.72#: 14780 POWER: 100  
SYSTEM: MEDIUM-VOLTAGE POWER SYSTEM - CLASS 1E  
DESC: THE NRC SSFI TEAM FOUND THAT DUE TO DESIGN ERRORS, DURING A DESIGN BASIS ACCIDENT THE LOADING ON THE STARTUP AND EMERGENCY TRANSFORMERS BY INITIATION OF ECCS EQUIPMENT WOULD TRIP UNDERVOLTAGE RELAYS DEENERGIZING THE LOADS.

**PI EVENTS FOR 89-2**

**SSA** 05/10/89 LER# 29889016 50.72#: 15592 POWER: 0  
DESC: RELAYS NOT LABELED AND A PLASTIC BUSH TO PREVENT A CORE SPRAY ACTUATION WAS PLACED ON THE WRONG RELAY SO THAT WHEN AN INITIATION SIGNAL SIMULATED CORE SPRAY STARTED.

**SSA** 05/29/89 LER# 29889020 50.72#: 15739 POWER: 0  
DESC: PLANT LOST F4160V BUS WHILE PERFORMING ACCEPTANCE TEST OF RELAYS. DIESEL OPS FOR MAINTENANCE.

**TABLE 8.23 (CONT.)**  
**COOPER STATION (CONT.)**

**PI EVENTS FOR 89-2 (CONT.)**

**SSF** 06/02/89 LER# 29889021 50.72#: 15789 POWER: 0  
 SYSTEM: ENGINEERED SAFETY FEATURES ACTUATION SYSTEM  
 DESC: UNDOCUMENTED WIRING CONFIGURATIONS ASSOCIATED WITH SAFETY RELATED EQUIPMENT DISCOVERED DURING DESIGN CHANGE ACTIVITIES. INSTRUMENTATION FOR TRIPS AND MONITORING REACTOR WATER LEVEL (SCRAM, PRIMARY AND SECONDARY ISOLATION FUNCTIONS, HPCI, RCIC & SBTIS)

**SSF** 06/13/89 LER# 29889022 50.72#: POWER: 0  
 SYSTEM: EMERGENCY/STANDBY GAS TREATMENT SYSTEM  
 DESC: BOTH TRAINS OF THE SBTG SYSTEM COULD BE RENDERED INOPERABLE BY THE FAILURE OF A SINGLE E/P CONVERTER. ALSO, THE SOLENOID PILOT VALVES SUPPLYING THE DIFF. PRESSURE CV'S COULD NOT BE VENTED DUE TO INSTRUMENT AIR CONNECTED TO EXHAUST PORT.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.77	.00	.47	.00	.52	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	1	0	1	0	1	0
SAFETY SYSTEM ACTUATIONS	2	0	1	2	2	0	0	2
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	1	0	0	0	1	0	4	2
FORCED OUTAGE RATE (%)	0	0	17	0	5	0	12	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.77	.00	.47	.00	.52	.00
CRITICAL HOURS	2208	2209	1297	332	2130	2209	1913	512
COLLECTIVE RADIATION EXPOSURE	19	20	60	149	20	21	28	NA
CAUSE CODES:								
ADMINISTRATIVE	3	0	2	4	0	0	4	NA
LICENSED OPERATOR	0	0	1	3	0	0	3	NA
OTHER PERSONNEL	1	0	2	2	1	0	4	NA
MAINTENANCE	4	0	3	9	7	1	5	NA
A) MAINT PERSONNEL	0	0	2	2	0	0	3	NA
B) SURV AND TEST	3	0	1	3	1	0	2	NA
C) EQUIPMENT	0	0	0	4	5	1	0	NA
D) POTENTIAL MAINT	1	0	0	3	6	0	0	NA
DESIGN/INSTALLATION/FABRICATION	2	2	3	1	0	0	6	NA
EQUIPMENT FAILURE	1	0	0	0	1	0	0	NA



TABLE 8.24  
CRYSTAL RIVER 3

PI EVENTS FOR 88-3

NONE

PI EVENTS FOR 88-4

**SSA** 10/14/88 LER# 30288021 50.72#: 13710 POWER: 0  
DESC: ESFAS LOGIC SIGNAL AND INADEQUATE TRAINING ON THE PROCEDURE CAUSED LPC1 TO INJECT, HPCI TAGGED OUT.

**SSA** 10/28/88 LER# 30288024 50.72#: 13838 POWER: 21  
DESC: SI STARTED MANUALLY TO MAINTAIN PZR PRESSURE.

**SCRAM** 10/28/88 LER# 30288024 50.72#: 13838 POWER: 21  
DESC: A RECENT MAIN TURBINE GOVERNOR VALVE SETTING CHANGE RESULTED IN AN EXCESSIVE STEAM DEMAND WHEN THE GENERATOR WAS LOADED. THIS DEMAND CAUSED LOW SG PRESSURE AND LEAD TO A REACTOR TRIP.

PI EVENTS FOR 89-1

**SE** 01/17/89 LER# 50.72#: POWER: 0  
DESC: RCP SHAFT FAILURE. (MORNING REPORT: 01/18/89, NO LETTER SUBMITTED 03/01/89)

**SSF** 01/31/89 LER# 30289004 50.72#: 14613 POWER: 70  
SYSTEM: DC POWER SYSTEM - CLASS 1E  
DESC: PERSONNEL ERROR IN OVERFILLING STATION 125 VDC STATION BATTERIES. BATTERIES DECLARED INOPERABLE UPON THE DISCOVERY OF HIGH ELECTROLYTE LEVELS (ABOVE TECH. SPEC. LIMIT). DISCOVERED DURING SURVEILLANCE.

**SSF** 03/15/89 LER# 30289009 50.72#: 15024 POWER: 0  
SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
DESC: CHANGE IN VENDOR GUIDANCE RESULTED IN THE DETERMINATION THAT THE DECAY HEAT REMOVAL PUMPS WERE UNABLE TO PERFORM THEIR SAFETY FUNCTION.

PI EVENTS FOR 89-2

**SSA** 04/09/89 LER# 30289013 50.72#: 15271 POWER: 0  
DESC: DIESEL GENERATORS STARTED WHEN 4160V BUS VOLTAGE DROOPED DOWN TO 3680V DURING STARTING OF BOILER FEED PUMP IN UNIT 1. DIESEL GENERATORS DID NOT LOAD TO THE BUS.

**SSA** 06/16/89 LER# 30289023 50.72#: 15886 POWER: 12  
DESC: TECHNICIAN BUMPED A CARRIER TRIP BUTTON CAUSING LOSS OF OFF-SITE POWER, DIESELS STARTED ON LOSS OF OFF-SITE POWER.

**SSA** 06/16/89 LER# 30289023 50.72#: 15886 POWER: 12  
DESC: TECHNICIAN BUMPED A CARRIER TRIP BUTTON CAUSING LOSS OF OFF-SITE POWER, 1 HPIS INJECTION VALVE MANUALLY OPENED TO MAINTAIN PRESSURIZER LEVEL.

**SE** 06/16/89 LER# 50.72#: 15923 POWER: 0  
DESC: LOOP AND CLASS 1E ELECTRIC POWER DISTRIBUTION ANOMALIES.

**SCRAM** 06/16/89 LER# 30289023 50.72#: 15886 POWER: 12  
DESC: TECHNICIAN BUMPED A CARRIER TRIP BUTTON CAUSING LOSS OF OFF-SITE POWER WHICH CAUSED THE REACTOR COOLANT PUMPS TO TRIP ON UNDERVOLTAGE AND REACTOR SCRAM ON LOSS OF REACTOR COOLANT PUMPS.

**SSA** 06/29/89 LER# 50.72#: 15986 POWER: 0  
DESC: LOST OFFSITE POWER WHEN STARTUP TRANSFORMER BREAKERS OPENED, 'B' EMERGENCY HAD TO BE MANUALLY ALIGNED TO SU TRANSFORMER BECAUSE 'B' DIESEL OOS.

**TABLE 8.24 (CONT.)**  
**CRYSTAL RIVER 3 (CONT.)**

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.34	.00	.52	.00	.00	.87	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	1
TOTAL SCRAMS	2	0	1	0	0	1	0	1
SAFETY SYSTEM ACTUATIONS	0	6	0	0	0	2	0	4
SIGNIFICANT EVENTS	0	1	1	1	0	0	1	1
SAFETY SYSTEM FAILURES	2	1	0	0	0	0	2	0
FORCED OUTAGE RATE (%)	7	0	5	0	0	2	0	12
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	1.34	.00	.52	.00	.00	.00	.00	.00
CRITICAL HOURS	1494	0	1913	2183	2208	1153	1016	279
COLLECTIVE RADIATION EXPOSURE	42	414	16	3	5	39	130	NA
CAUSE CODES:								
ADMINISTRATIVE	4	3	5	2	2	7	5	NA
LICENSED OPERATOR	2	1	0	0	1	1	1	NA
OTHER PERSONNEL	2	6	3	0	2	5	0	NA
MAINTENANCE	10	7	9	2	2	7	4	NA
A) MAINT PERSONNEL	0	4	3	0	0	3	1	NA
B) SURV AND TEST	6	3	3	1	2	4	3	NA
C) EQUIPMENT	4	0	1	1	0	0	0	NA
D) POTENTIAL MAINT	2	1	4	1	0	0	0	NA
DESIGN/INSTALLATION/FABRICATION	2	0	1	2	3	3	7	NA
EQUIPMENT FAILURE	1	1	0	0	0	0	0	NA

TABLE 8.25

DAVIS-BESSE

PI EVENTS FOR 88-3

**SSF** 07/13/88 LER# 34688016 50.72#: 12831 POWER: 0  
 SYSTEM: LOW-VOLTAGE POWER SYSTEM - CLASS 1E  
 DESC: NON SAFETY ELECTRICAL CABLES DISCOVERED TO BE BUNDLED WITH SAFETY RELATED CABLES, THIS CONDITION COULD HAVE AFFECTED MANY SAFETY SYSTEMS, INCLUDING THE DIESEL GENERATORS.

**SSF** 09/09/88 LER# 34688019 50.72#: 13420 POWER: 0  
 SYSTEM: DC POWER SYSTEM - CLASS 1E  
 DESC: IMPROPER CRIMPS FOUND IN VITAL DC MCCS. EVALUATION DETERMINED THAT DURING A SEISMIC EVENT, VOLTAGE COULD HAVE DROPPED RESULTING IN LOSS OF DC CONTROL POWER, ALSO LOSS OF ABILITY TO START DIESELS.

PI EVENTS FOR 88-4

**SCRAM** 12/17/88 LER# 34688028 50.72#: 14278 POWER: 28  
 DESC: MAIN FEEDWATER FLOW OSCILLATIONS CAUSED POWER FLUCTUATIONS AND SCRAM ON INTERMEDIATE HIGH FLUX DUE TO FAILURE TO ESTABLISH HI FLUX TRIP SETPOINTS COMING OFF LOW LEVEL LIMITS AND AN ERROR IN HEAT BALANCE.

PI EVENTS FOR 89-1

**SCRAM** 01/18/89 LER# 34689003 50.72#: 14527 POWER: 100  
 DESC: LOGIC DID NOT RESET WHEN TESTING CRD WHICH CAUSED THE FRV TO CLOSE AND TURBINE TRIPPED CAUSING HIGH PRESSURE SCRAM.

PI EVENTS FOR 89-2

**SCRAM** 05/30/89 LER# 34689005 50.72#: 15750 POWER: 100  
 DESC: REACTOR SCRAM WHEN THE TURBINE TRIPPED ON LOW CONDENSER VACUUM DUE TO THE LOSS OF 13.8KV BUS 'F4' CAUSED LOSS OF CIRC WATER PUMPS.

**SSF** 06/29/89 LER# 34689005 50.72#: 15991 POWER: 100  
 SYSTEM: HIGH PRESSURE SAFETY INJECTION SYSTEM  
 DESC: LICENSEE DISCOVERED THAT THE DBA OPENING TIMES FOR THE HPSI DISCHARGE VALVES COULD NOT BE MET WITH PRESENT DDG LOAD SEQUENCE CIRCUITRY. VALVES HAVE NO "SEAL IN", EDG SEQUENCER WOULD SEND A 3 SEC. OPEN SIGNAL AND STROKE TIME OF VALVES IS 8 SEC.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.04	.46	.00	.00	.00	2.15	.51	.46
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	2	1	0	0	0	1	1	1
SAFETY SYSTEM ACTUATIONS	1	0	0	0	0	0	0	0
SIGNIFICANT EVENTS	1	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	0	1	1	0	2	0	0	1
FORCED OUTAGE RATE (%)	14	2	0	0	0	15	6	1
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.52	.46	.00	.00	.00	2.15	.51	.46
CRITICAL HOURS	1932	2176	1661	0	0	465	1962	2168
COLLECTIVE RADIATION EXPOSURE	8	14	26	162	102	17	7	NA
CAUSE CODES:								
ADMINISTRATIVE	3	1	3	4	5	3	2	NA
LICENSED OPERATOR	0	0	0	1	0	4	1	NA
OTHER PERSONNEL	1	2	1	4	1	2	0	NA
MAINTENANCE	3	3	4	4	4	4	2	NA
A) MAINT PERSONNEL	1	1	2	3	2	1	0	NA
B) SURV AND TEST	2	1	1	1	3	2	1	NA
C) EQUIPMENT	0	1	0	0	0	1	0	NA
D) POTENTIAL MAINT	0	1	2	0	0	1	1	NA
DESIGN/INSTALLATION/FABRICATION	1	1	4	1	4	1	0	NA
EQUIPMENT FAILURE	1	0	0	0	1	0	1	NA

**TABLE 8.26**  
**DIABLO CANYON 1**

**PI EVENTS FOR 88-3**

**SCRAM** 07/10/88 LER# 27588020 50.72#: 12775 POWER: 2  
DESC: OVER TEMPERATURE DELTA-T CAUSED A REACTOR TRIP WHILE CALIBRATING PZR PRESSURE. TRIP ATTRIBUTED TO I&C TECHNICIAN TESTING CHANNEL "A" INSTEAD OF CHANNEL "B".

**SCRAM** 07/12/88 LER# 27588021 50.72#: 12803 POWER: 18  
DESC: A REACTOR TRIP OCCURRED DUE TO STEAM GENERATOR HIGH-HIGH LEVEL WHEN MAIN FEEDWATER OSCILLATIONS OCCURRED AFTER CONTROL WAS TAKEN FROM MANUAL TO AUTOMATIC BEFORE MAIN TURBINE WAS ON LINE.

**SSA** 07/17/88 LER# 32388008 50.72#: POWER: 30  
DESC: LOSS OF STARTUP POWER TO UNIT 1 AND 2 CAUSED UNIT 1 DIESEL TO START ON LOW VOLT SIGNAL.

**SCRAM** 08/30/88 LER# 27588025 50.72#: 13328 POWER: 99  
DESC: SPEED PROBE ON MFP FAILED CAUSING MFP TRIP, LOW SG LEVEL, AND A REACTOR SCRAM.

**SCRAM** 09/01/88 LER# 27588026 50.72#: 13350 POWER: 13  
DESC: PROBLEM WITH ANTI-MOTERING LOGIC CAUSED BY A ROOT VALVE BEING SHUT RESULTED IN A TURBINE TRIP AND A REACTOR TRIP.

**PI EVENTS FOR 88-4**

**SSF** 10/14/88 LER# 27588028 50.72#: POWER: 100  
SYSTEM: MAIN STEAM ISOLATION VALVES  
DESC: MAIN STEAM ISOLATION VALVES DECLARED INOPERABLE BECAUSE OF INADEQUATE ENVIRONMENTAL QUALIFICATION OF SURGE SUPPRESSORS WITH ELECTRICAL CONNECTIONS. BOTH UNITS

**PI EVENTS FOR 89-1**

**SE** 01/17/89 LER# 32339001 50.72#: POWER:  
DESC: UNRECOGNIZED INOPERABILITY OF AUX FEEDWATER SYSTEM DUE TO CLOSURE OF ONE OF TWO REDUNDANT STEAM SUPPLY VALVES TO TURBINE. (SOURCE NOT GIVEN)

**SSF** 02/24/89 LER# 27589002 50.72#: 14853 POWER: 100  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: FAILURE TO REINSTALL BACKWATER CHECK VALVES IN FUEL OIL TRANSFER PUMP VAULT DRAIN DUE TO INADEQUATE INSTRUCTIONS TO CONTRACTOR PERSONNEL. POTENTIAL FOR EDG TO NOT PERFORM THEIR SAFETY FUNCTION.

**PI EVENTS FOR 89-2**

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.47	.65	.00	1.03	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	2	0	0	0
TOTAL SCRAMS	0	1	1	0	4	0	0	0
SAFETY SYSTEM ACTUATIONS	1	0	0	1	1	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	1	0
SAFETY SYSTEM FAILURES	0	0	0	0	0	1	1	0
FORCED OUTAGE RATE (%)	0	7	4	0	4	0	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.47	.00	.00	.51	.00	.00	.00
CRITICAL HOURS	2200	2121	1532	0	1942	2209	2160	2183
COLLECTIVE RADIATION EXPOSURE	7	7	69	154	64	143	3	NA
CAUSE CODES:								
ADMINISTRATIVE	1	7	3	5	3	2	3	NA
LICENSED OPERATOR	2	1	0	1	1	1	0	NA
OTHER PERSONNEL	2	3	4	2	4	3	2	NA
MAINTENANCE	4	13	9	7	6	3	3	NA
A) MAINT PERSONNEL	1	5	2	1	2	2	2	NA
B) SURV AND TEST	3	5	3	4	4	1	1	NA
C) EQUIPMENT	0	5	2	2	2	0	0	NA
D) POTENTIAL MAINT	0	2	4	2	1	0	0	NA
DESIGN/INSTALLATION/FABRICATION	1	2	0	2	3	2	1	NA
EQUIPMENT FAILURE	0	2	0	0	0	0	0	NA

**TABLE 8.27**  
**DIABLO CANYON 2**

**PI EVENTS FOR 88-3**

**SSA** 07/17/88 LER# 32388008 50.72#: 12870 POWER: 50  
DESC: GROUND ON 12KV LINE CAUSED SCRAM AND SUBSEQUENT HPCI ON HIGH STEAM LINE DIFFERENTIAL PRESSURE. DIESELS STARTED ON LOSS OF STARTUP POWER.

**SSA** 07/17/88 LER# 32388008 50.72#: 12870 POWER: 50  
DESC: GROUND ON 12KV LINE CAUSED SCRAM AND SUBSEQUENT HPCI ON HIGH STEAM LINE DIFFERENTIAL PRESSURE. DIESELS STARTED ON LOSS OF STARTUP POWER.

**SCRAM** 09/01/88 LER# 32388010 50.72#: 13345 POWER: 100  
DESC: A REACTOR TRIP RESULTED WHEN ONE SEISMIC CHANNEL WAS TAKEN TO TEST WHILE AN UNDETECTED SEISMIC RELAY WAS CLOSED.

**PI EVENTS FOR 88-4**

**SSA** 10/10/88 LER# 32388012 50.72#: 13667 POWER: 0  
DESC: ELECTRICIAN JUMPED ACROSS WRONG TRANSFORMER CAUSING LOSS OF 4160V BUSES F, G, AND H. DIESEL 1-3 STARTED AND SUPPLIED BUSES.

**SE** 10/10/88 LER# 32388012 50.72#: 13667 POWER: 0  
DESC: FAILURE OF STUDS ON ANCHOR DARLING CHECK VALVES. (MORNING REPORT: 10/17/88)

**SSF** 10/14/88 LER# 32388028 50.72#: 13667 POWER: 0  
SYSTEM: MAIN STEAM ISOLATION VALVES  
DESC: MAIN STEAM ISOLATION VALVES DECLARED INOPERABLE BECAUSE OF INADEQUATE ENVIRONMENTAL QUALIFICATION OF SURGE SUPPRESSORS WITH ELECTRICAL CONNECTIONS. BOTH UNITS

**PI EVENTS FOR 89-1**

**SE** 01/17/89 LER# 32389001 50.72#: 14853 POWER: 100  
DESC: UNRECOGNIZED INOPERABILITY OF AUX FEEDWATER SYSTEM DUE TO CLOSURE OF ONE OF TWO REDUNDANT STEAM SUPPLY VALVES TO TURBINE. (SOURCE NOT GIVEN)

**SSF** 01/17/89 LER# 32389001 50.72#: 14853 POWER: 100  
SYSTEM: AUXILIARY/EMERGENCY FEEDWATER SYSTEM  
DESC: WITH AFW PUMP 2-3 INOPERABLE FOR VALVE REPAIR, AFW PUMP 2-1 WAS INADVERTENTLY RENDERED INOPERABLE FOR MAINTENANCE. THE AFW SYSTEM DID NOT MEET DESIGN BASIS REQUIREMENTS WHILE BOTH AFW PUMPS WERE INOPERABLE.

**SSF** 02/24/89 LER# 27589002 50.72#: 14853 POWER: 999  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: FAILURE TO REINSTALL BACKWATER CHECK VALVES IN FUEL OIL TRANSFER PUMP VAULT DRAIN DUE TO INADEQUATE INSTRUCTIONS TO CONTRACTOR PERSONNEL. POTENTIAL FOR EGG TO NOT PERFORM THEIR SAFETY FUNCTION.

**PI EVENTS FOR 89-2**

**SCRAM** 04/16/89 LER# 32389005 50.72#: 15357 POWER: 50  
DESC: THE GENERATOR BACKUP RELAY ACTUATED WHICH TRIPPED THE GENERATOR OUTPUT. A CIRCULATOR WATER PUMP FAILED TO START. CONDENSER VACUUM WAS LOST. THE REACTOR TRIPPED ON LOW SG LEVEL.

**TABLE 8.27 (CONT.)**  
**DIABLO CANYON 2 (CONT.)**

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% P								
/1000 CRITICAL HOURS	.00	.00	.47	.00	.79	.00	.00	.51
SCRAMS < 15% POWER	1	0	0	0	0	0	0	0
TOTAL SCRAMS	1	0	1	0	1	0	0	1
SAFETY SYSTEM ACTUATIONS	2	0	0	0	2	1	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	1	1	0
SAFETY SYSTEM FAILURES	0	1	0	0	0	1	2	0
FORCED OUTAGE RATE (%)	5	7	3	0	33	0	0	4
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.49	.47	.00	1.59	.00	.00	.51
CRITICAL HOURS	1868	2058	2117	2183	1258	632	2160	1946
COLLECTIVE RADIATION EXPOSURE	7	7	69	154	64	143	3	NA
CAUSE CODES:								
ADMINISTRATIVE	3	1	1	3	1	8	4	NA
LICENSED OPERATOR	4	0	1	0	0	1	0	NA
OTHER PERSONNEL	1	3	0	2	1	5	0	NA
MAINTENANCE	5	5	4	6	7	10	3	NA
A) MAINT PERSONNEL	2	3	1	1	1	6	2	NA
B) SURV AND TEST	2	1	1	3	1	4	1	NA
C) EQUIPMENT	0	1	2	2	0	1	0	NA
D) POTENTIAL MAINT	3	1	2	2	1	2	0	NA
DESIGN/INSTALLATION/FABRICATION	2	3	2	1	2	5	1	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	1	NA

**TABLE 8.28****DRESDEN 2****PI EVENTS FOR 88-3**

**SSF** 07/08/88 LER# 23788013 50.72#: 12741 POWER: 72  
SYSTEM: ENGINEERED SAFETY FEATURES ACTUATION SYSTEM  
DESC: FAILED STANDBY GAS TREATMENT MASTER TRIP UNIT RESULTED IN ANALOG TRIP PANEL FAILURE. HPCI MADE INOPERABLE. ONE TRAIN OF SBGTS AND LPCI ALSO MADE INOPERABLE.

**SSF** 08/25/88 LER# 23788015 50.72#: 13280 POWER: 77  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: HPCI DECLARED INOPERABLE WHEN IT WAS DISCOVERED THAT THE HPCI HIGH STEAM FLOW ISOLATION TRANSMITTER SETPOINTS WERE OUT OF TECH. SPEC. LIMITS.

**PI EVENTS FOR 88-4**

**SE** 11/15/88 LER# 50.72#: POWER: 0  
DESC: DEGRADATION OF SAFETY-RELATED EQUIPMENT (STM SUPPLY VALVES TO HPCI & ISOLATION CONDENSER) & ELECTRICAL WIRING CAUSED BY HIGH TEMP IN UPPER REGION OF DRYWELL. VENTILATION PORT LEFT IN CLOSED POSITION 04/19/87, PROCS MISINTERPRETED. (MR: 11/15/88)

**PI EVENTS FOR 89-1**

**SE** 01/30/89 LER# 50.72#: 14597 POWER: 0  
DESC: MISSING BALLS IN 2 CRD ACCUMULATOR CHARGING WATER CHECK VALVES.

**SSA** 02/05/89 LER# 23789005 50.72#: 14657 POWER: 0  
DESC: FALSE HIGH DRYWELL PRESSURE FROM TEST EQUIPMENT DUE TO A LEAKING INLET VALVE CAUSED LPCI AND LPCS INJECTION.

**SSF** 02/21/89 LER# 23789013 50.72#: 14814 POWER: 16  
SYSTEM: EMERGENCY/STANDBY GAS TREATMENT SYSTEM  
DESC: POSSIBLE SINGLE FAILURE LOSS OF BOTH STANDBY GAS TREATMENT TRAINS DUE TO A DESIGN DEFICIENCY.

**SCRAM** 03/04/89 LER# 23789012 50.72#: 14926 POWER: 92  
DESC: TECHNICIAN TRIPPED WRONG BREAKER CAUSING MFP TO TRIP CAUSING LOW REACTOR LEVEL SCRAM.

**SSF** 03/14/89 LER# 23789011 50.72#: 15016 POWER: 99  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: THE HPCI SYSTEM WAS DECLARED INOPERABLE DUE TO FAILURE OF THE HPCI GLAND SEAL LEAKOFF PUMP DUE TO DEGRADED MOTOR START CIRCUIT CAPACITOR. POTENTIAL FOR CONDENSATE OVERFLOW INTO HPCI ROOM RESULTING IN HPCI ISOLATION.

**PI EVENTS FOR 89-2**

**SSF** 04/07/89 LER# 23789014 50.72#: 15245 POWER: 95  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: THE HPCI SYSTEM MINIMUM FLOW VALVE FAILED TO OPEN DURING SURVEILLANCE TEST. THE VALVE BREAKER TRIPPED DUE TO A THERMAL OVERLOAD CONDITION CAUSED BY MOISTURE INTRUSION AT THE MOTOR WINDINGS. MOISTURE FROM CELL W/G/FOUNDATION. HPCI DECLARED INOPERABLE.

TABLE 8.28 (CONT.)

DRESDEN 2 (CONT.)

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.03	.46	.00	.00	.00	.00	1.03	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	2	1	0	0	0	0	1	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	1	0
SIGNIFICANT EVENTS	0	0	0	1	0	1	1	0
SAFETY SYSTEM FAILURES	1	2	0	4	2	0	2	1
FORCED OUTAGE RATE (%)	15	3	0	0	0	0	9	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	1.03	.00	.00	.53	.00	.00	.00	.00
CRITICAL HOURS	1933	2183	2184	1882	2208	700	929	2183
COLLECTIVE RADIATION EXPOSURE	55	37	56	253	46	343	370	NA
CAUSE CODES:								
ADMINISTRATIVE	3	1	5	5	0	3	7	NA
LICENSED OPERATOR	0	1	0	1	0	1	2	NA
OTHER PERSONNEL	0	3	1	3	1	1	3	NA
MAINTENANCE	7	5	4	7	3	7	11	NA
A) MAINT PERSONNEL	0	0	1	4	0	4	4	NA
B) SURV AND TEST	2	4	3	2	2	1	3	NA
C) EQUIPMENT	5	1	0	1	2	3	3	NA
D) POTENTIAL MAINT	4	1	1	2	2	3	3	NA
DESIGN/INSTALLATION/FABRICATION	0	0	1	1	0	0	3	NA
EQUIPMENT FAILURE	1	0	0	0	1	0	2	NA



TABLE 6.29

DRESDEN 3

PI EVENTS FOR 88-3

NONE

PI EVENT FOR 88-4

**SCRAM** 11/27/88 LER# 24988017 50.72#: 14091 POWER: 17  
DESC: THE MAIN TURBINE TRIPPED DUE TO HIGH VIBRATION. MSIV'S CLOSED DUE TO A VIBRATION INDUCED SPURIOUS LOW STEAM LINE SIGNAL. THIS CAUSED A REACTOR TRIP.

PI EVENTS FOR 89-1

**SSF** 02/21/89 LER# 23789013 50.72#: 1484  
SYSTEM: EMERGENCY/STANDBY GAS TREATMENT SYSTEM  
DESC: POSSIBLE SINGLE FAILURE LOSS OF BOTH STANDBY GAS TREATMENT TRAINS DUE TO A DESIGN DEFICIENCY.

**SSA** 03/25/89 LER# 24989001 50.72#: 15116 POWER: 89  
DESC: REACTOR SCRAM CAUSED LOSS OF OFFSITE POWER AND ALL DIESELS STARTED, HPCI MANUALLY STARTED TO RESTORE REACTOR LEVEL AFTER SCRAM.

**SSA** 03/25/89 LER# 24989001 50.72#: 15116 POWER: 89  
DESC: REACTOR SCRAM CAUSED LOSS OF OFFSITE POWER AND ALL DIESELS STARTED, HPCI MANUALLY STARTED TO RESTORE REACTOR LEVEL AFTER SCRAM.

**SCRAM** 03/25/89 LER# 24989001 50.72#: 15116 POWER: 89  
DESC: AUX TRANSFORMER TRIPPED, POWER SUPPLY SHIFTED, MFP TRIPPED, STANDBY PUMP STARTED AND RAISED LEVEL TO HIGH TURBINE TRIP SETPOINT CAUSING SCRAM ON TURBINE TRIP.

**SCRAM** 03/30/89 LER# 24989002 50.72#: 15167 POWER: 70  
DESC: SUPPLY BREAKER TO 'B' RPS BUS OPENED CONCURRENTLY WITH THE LOCKUP OF THE '3A' MAIN STEAM RADIATION MONITOR CAUSING A SCRAM.

PI EVENTS FOR 89-2

**SSF** 04/03/89 LER# 24989001 50.72#: 15200 POWER: 100  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: HPCI SYSTEM GLAND SEAL WATER PUMP MOTOR FAILED DURING SURVEILLANCE TEST. HPCI DECLARED INOPERABLE. ONE CORE SPRAY PUMP WAS PREVIOUSLY INOPERABLE.

**SSF** 04/12/89 LER# 24989005 50.72#: 15303 POWER: 100  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: THE HPCI SYSTEM WAS DECLARED INOPERABLE DUE TO AN EQ PROBLEM ON THE TURBINE STEAM SUPPLY ISOLATION VALVE MOTOR TERMINAL BOX. SYSTEM WAS DECLARED INOPERABLE DUE TO THE QUESTIONABLE OPERABILITY STATUS OF THE VALVE.

**SCRAM** 04/15/89 LER# 24989006 50.72#: 15342 POWER: 92  
DESC: A REACTOR TRIP OCCURRED AFTER ALL MAIN STEAM STOP VALVES WENT CLOSED.

TABLE 8.29 (CONT.)

DRESDEN 3 (CONT.)

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.73	.00	.00	.00	.00	.52	.98	.65
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	2	0	0	0	0	1	2	1
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	2	0
SIGNIFICANT EVENTS	1	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	6	0	0	0	0	0	1	2
FORCED OUTAGE RATE (%)	57	0	0	0	0	0	7	4
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	2.60	.00	.00	.00	.00	.00	1.47	1.94
CRITICAL HOURS	1155	2209	2066	133	2208	1939	2040	1548
COLLECTIVE RADIATION EXPOSURE	55	37	56	253	46	343	370	NA
CAUSE CODES:								
ADMINISTRATIVE	4	1	3	10	0	1	1	NA
LICENSED OPERATOR	0	0	0	0	0	0	2	NA
OTHER PERSONNEL	2	1	0	3	1	0	1	NA
MAINTENANCE	8	1	4	12	1	2	2	NA
A) MAINT PERSONNEL	3	0	1	7	0	1	1	NA
B) SURV AND TEST	2	1	2	4	1	0	0	NA
C) EQUIPMENT	5	0	1	3	0	0	2	NA
D) POTENTIAL MAINT	3	0	0	3	0	1	1	NA
DESIGN/INSTALLATION/FABRICATION	2	0	2	2	0	0	2	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	1	NA

**TABLE 8.30  
DUANE ARNOLD**

**PI EVENTS FOR 88-1**

**SCRAM** 07/24/80 LER# 33188008 50.72#: 12944 POWER: 61  
DESC: FAILURE OF VIBRATION TRANSMITTER CAUSED A TURBINE TRIP ON HIGH VIBRATION RESULTING IN A REACTOR TRIP.

**PI EVENT: FOR 88-4**

**SSA** 10/17/88 LER# 33188016 50.72#: 13747 POWER: 0  
DESC: LOW VOLTS ON 1A3 BUS - "A" DIESEL LOCKED-OUT FOR MAINTENANCE.

**SSA** 10/26/88 LER# 33188013 50.72#: 13817 POWER: 0  
DESC: MOISTURE IN RX LEVEL SWITCHES CAUSED LOW LEVEL SIGNAL AND HPCI START.

**SE** 11/21/88 LER# 50.72#: POWER: 0  
DESC: OPERATING ENVIRONMENT MORE SEVERE THAN DESIGN. (MORNING REPORT: 11/25/88)

**PI EVENTS FOR 89-1**

**SSF** 01/26/89 LER# 33189002 50.72#: 14575 POWER: 90  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: HPCI DECLARED INOPERABLE AFTER STEAM ISOLATION VALVE WENT CLOSED DURING SURVEILLANCE TEST (TWICE). HIGH STEAM FLOW WAS SENSED BUT DID NOT EXIST. CAUSE BY ELECTRONIC FAILURE IN THE TURBINE GOVERNOR.

**SSA** 02/02/89 LER# 33189003 50.72#: 14627 POWER: 100  
DESC: HPCI AND RCIC AUTO STARTED WHEN MSIV SHUT AND CAUSED LOW REACTOR LEVEL DUE TO SHRINK - WHEN RELIEF VALVE OPENED, SWELLED TO HIGH LEVEL, TRIPPED HPCI AND RCIC - HPCI USED MANUALLY TO CONTROL LEVEL.

**SCRAM** 02/02/89 LER# 33189003 50.72#: 14627 POWER: 100  
DESC: DURING A TEST - TOO MUCH HYDROGEN WAS ADDED CAUSING HIGH MAINSTEAM LINE RADIATION AND MSIV CLOSURE - REACTOR SCRAM ON MSIV CLOSURE.

**SSF** 02/24/89 LER# 33189007 50.72#: 14847 POWER: 100  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: WITH RCIC DECLARED INOPERABLE (RE 14846), HPCI DECLARED INOPERABLE AFTER TURBINE OVERSPEED AND STEAM LINE ISOLATED DURING PERFORMANCE OF SURVEILLANCE. THE TURBINE GOVERNOR CONTROL WOULD NOT CONTROL STEAM FLOW ON TURBINE STARTUP. CAUSE UNKNOWN.

**SSF** 02/24/89 LER# 33189006 50.72#: 14846 POWER: 100  
SYSTEM: REACTOR CORE ISOLATION COOLING SYSTEM  
DESC: RCIC DECLARED INOPERABLE AFTER SYSTEM ISOLATED ON SPURIOUS STEAM LEAK. TC WIRE FOUND NEARLY BROKEN AT TEMPERATURE DETECTION MODULE TERMINATION AND LOOSE CONNECTIONS WERE ALSO TIGHTENED.

**SSF** 03/02/89 LER# 33189006 50.72#: 14908 POWER: 0  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: HPCI SYSTEM EXPERIENCED TWO ESF ISOLATIONS ON HIGH AMBIENT TEMPERATURE. HPCI WAS DECLARED INOPERABLE. THE CAUSE WAS FOUND TO BE A POOR CONNECTION OF TEST SWITCH INTERNAL CONTACTS BETWEEN THE THERMOCOUPLE AND THE TEMPERATURE DETECTION MODULE.

**SSA** 03/05/89 LER# 33189008 50.72#: 14937 POWER: 100  
DESC: (SPECIAL TEST PROCEDURE 156) CAUSED MSIV CLOSURE SCRAM. RCIC AND HPCI STARTED ON LOW RX LEVEL.

**SCRAM** 03/05/89 LER# 33189008 50.72#: 14937 POWER: 100  
DESC: MSIV CLOSURE CAUSED REACTOR SCRAM WHEN INCREASING HIGH RADIATION SETPOINT.

**PI EVENTS FOR 89-2**

**SCRAM** 06/12/89 LER# 33189009 50.72#: 15841 POWER: 100  
DESC: SPURIOUS APRM UPSCALE TRIP CAUSED A REACTOR SCRAM DUE TO HAND HELD RADIOS BEING KEYED IN THE VICINITY OF THE APRM FLOW BIASING TRANSMITTERS.

TABLE 8.30 (CONT.)  
DUANE ARNOLD (CONT.)

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.48	.00	1.15	.48
SCRAMS < 15% POWER	0	0	0	0	1	0	0	0
TOTAL SCRAMS	0	0	0	0	1	0	2	1
SAFETY SYSTEM ACTUATIONS	0	0	0	0	3	2	2	0
SIGNIFICANT EVENTS	0	0	0	0	0	1	0	0
SAFETY SYSTEM FAILURES	1	1	2	2	0	0	4	0
FORCED OUTAGE RATE (%)	0	19	0	0	3	100	23	5
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.55	.00	.00	.48	5.78	1.72	.95
CRITICAL HOURS	2069	1823	2184	2162	2091	173	174	2103
COLLECTIVE RADIATION EXPOSURE	27	37	22	17	50	526	45	NA
CAUSE CODES:								
ADMINISTRATIVE	5	1	0	2	3	2	3	NA
LICENSED OPERATOR	1	0	0	0	0	1	0	NA
OTHER PERSONNEL	1	1	0	1	0	2	2	NA
MAINTENANCE	5	3	1	3	3	1	6	NA
A) MAINT PERSONNEL	5	2	0	3	1	0	2	NA
B) SURV AND TEST	1	0	0	2	1	1	2	NA
C) EQUIPMENT	2	1	1	0	1	0	1	NA
D) POTENTIAL MAINT	2	0	1	0	2	0	1	NA
DESIGN/INSTALLATION/FABRICATION	0	0	0	2	4	5	1	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	1	NA

TABLE 8.31

FARLEY 1

PI EVENTS FOR 88-3

NONE

PI EVENTS FOR 88-4

SCRAM 10/21/88 LER# 34888021 50.72#: 13782 POWER: 100  
DESC: LOSS OF DIGITAL EHC CAUSED TURBINE TRIP AND REACTOR TRIP.

PI EVENTS FOR 89-1

NONE

PI EVENTS FOR 89-2

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.45	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	0	0	1	0	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	0	1	0	1	0	0	0	0
FORCED OUTAGE RATE (%)	0	11	0	2	0	1	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.00
CRITICAL HOURS	2208	2007	2041	982	2208	2198	2160	2183
COLLECTIVE RADIATION EXPOSURE	18	205	64	192	10	11	35	NA
CAUSE CODES:								
ADMINISTRATIVE	0	2	1	4	0	1	0	NA
LICENSED OPERATOR	0	0	2	0	0	0	0	NA
OTHER PERSONNEL	0	1	2	1	0	3	0	NA
MAINTENANCE	1	3	4	4	0	6	0	NA
A) MAINT PERSONNEL	0	3	2	0	0	3	0	NA
R) SURV AND TEST	0	0	0	1	0	1	0	NA
C) EQUIPMENT	1	0	2	3	0	2	0	NA
D) POTENTIAL MAINT	0	1	1	3	0	3	0	NA
DESIGN/INSTALLATION/FABRICATION	4	3	1	2	1	0	0	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

TABLE 8.32

FARLEY 2

PI EVENTS FOR 88-3

NONE

PI EVENTS FOR 88-4

NONE

PI EVENTS FOR 89-1

NONE

PI EVENTS FOR 89-2

**SFA** 04/29/89 LER# 36489005 50.72#: 15479 POWER: 0  
 DESC: INSTRUMENTATION AND CONTROL PERSONNEL PROVIDED THE OPERATORS WITH THE WRONG PROCEDURE CAUSING A SAFETY INJECTION ACTUATION DURING TESTING.

**SCRAM** 05/22/89 LER# 36489007 50.72#: 15676 POWER: 35  
 DESC: LOOSE CABLE TO MFP TRIP THROTTLE AND GOVERNOR VALVES WERE BUMPED BY SOMEONE CLEANING CAUSING MFP TO TRIP AND SCRAM ON LOW SG LEVEL

**SCRAM** 05/27/89 LER# 36489008 50.72#: 15727 POWER: 8P  
 DESC: EXCITATION TO MAIN GENERATOR LOST DUE TO A FAILED BEARING ON THE EXCITER CAUSING TURBINE TRIP REACTOR SCRAM.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	2.09
SCRAMS < 15% POWER	0	1	0	0	0	0	0	0
TOTAL SCRAMS	0	1	0	0	0	0	0	2
SAFETY SYSTEM ACTUATIONS	0	2	0	0	0	0	0	1
SIGNIFICANT EVENTS	0	2	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	0	0	1	1	0	0	0	0
FORCED OUTAGE RATE (%)	0	67	0	0	0	0	0	13
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	2.91	.00	.00	.00	.00	.00	.00
CRITICAL HOURS	2208	344	2184	2183	2208	2209	1995	959
COLLECTIVE RADIATION EXPOSURE	18	205	64	192	10	11	35	NA
CAUSE CODES:								
ADMINISTRATIVE	0	3	2	2	0	0	1	NA
LICENSED OPERATOR	0	1	2	0	0	0	0	NA
OTHER PERSONNEL	0	3	1	0	0	2	0	NA
MAINTENANCE	0	7	2	2	0	3	1	NA
A) MAINT PERSONNEL	0	4	1	0	0	1	0	NA
B) SURV AND TEST	0	2	1	1	0	0	1	NA
C) EQUIPMENT	0	3	0	1	0	1	0	NA
D) POTENTIAL MAINT	0	2	0	1	0	1	0	NA
DESIGN/INSTALLATION/FABRICATION	2	1	4	0	1	1	0	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

TABLE 8.33

FERMI 2

PI EVENTS FOR 88-3

- SSF** 07/26/88 LER# 34188028 50.72#: 12975 POWER: 0  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: THE HPCI SYSTEM INJECTION VALVE FAILED TO OPEN DURING A SURVEILLANCE TEST. CAUSE WAS FOUND TO BE  
GROUNDING OF THE VALVE OPEN CIRCUIT BELIEVED TO BE CAUSED BY VIBRATION.
- SE** 08/02/88 LER# 34188029 50.72#: 13060 POWER: 0  
DESC: UNDETECTED, NONINDICATING HALF SCRAM SIGNAL UNKNOWINGLY EXISTS ON A GROUP OF RODS CONCURRENT WITH  
SURVEILLANCE TESTS WHICH INSERT A HALFSRAM SIGNAL ON THE OPPOSITE RPS CHANNEL CAUSING AN  
UNEXPECTED PARTIAL CORE SCRAM.
- SCRAM** 08/13/88 LER# 34188030 50.72#: 13181 POWER: 77  
DESC: TURBINE TRIP DUE TO HIGH VIBRATION ON BEARINGS #8 AND #9 DUE TO CONTROL VALVE FAILURE CAUSING LOW OIL  
TEMP WHICH CAUSED OIL WHIRL WHICH EXCEEDED VIBRATION SETPOINTS RESULTING IN A REACTOR TRIP.
- SSF** 08/20/88 LER# 34188032 50.72#: 13249 POWER: 41  
SYSTEM: LOW PRESSURE COOLANT INJECTION SYSTEM  
DESC: LPCI WAS DECLARED INOPERABLE WHEN THE 'B' RECIRC PUMP DISCHARGE VALVE WOULD NOT CLOSE. PLANS ARE TO  
ENTER DRYWELL TO REPAIR VALVE, BUT EVENT OCCURS AGAIN ON 08/28/88 - RE 13315.
- SSF** 08/28/88 LER# 34188032 50.72#: 13315 POWER: 35  
SYSTEM: LOW PRESSURE COOLANT INJECTION SYSTEM  
DESC: LPCI WAS DECLARED INOPERABLE WHEN THE 'B' RECIRC PUMP DISCHARGE VALVE FAILED TO CLOSE. ('B' RECIRC  
PUMP COULD NOT BE RESTARTED UNTIL DISCHARGE VALVE CLOSED). HPCI WAS INOPERABLE FOR MAINTENANCE.

PI EVENTS FOR 88-4

NONE

PI EVENTS FOR 89-1

- SE** 01/04/89 LER# 34189002 50.72#: 14402 POWER: 0  
DESC: ATWS RECIRCULATION PUMP TRIP BREAKER FAILURE.
- SSF** 01/04/89 LER# 34189002 50.72#: 14402 POWER: 0  
SYSTEM: ANTICIPATED TRANSIENT WITHOUT SCRAM SYSTEM  
DESC: "B" MG SET FIELD BREAKER FAILED TO OPEN UPON SHUTDOWN OF THE "B" RECIRC PUMP. THE FAILURE OF THE  
BREAKER TO TRIP WOULD HAVE PREVENTED ATWS IF PLANT HAD BEEN OPERATING. BOTH BREAKER'S COILS  
BURNED.
- SSA** 01/10/89 LER# 34189003 50.72#: 14456 POWER: 0  
DESC: LOST DIVISION 101 ESF BUS DUE TO IMPROPERLY INSTALLED EPOXY SEAL IN MAY OF 1988 CAUSED DIESEL TO START  
AND LOAD BUSES 64B AND 64C.
- SSF** 01/18/89 LER# 34189004 50.72#: 14528 POWER: 100  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: HPCI DECLARED INOPERABLE WHEN THE STEAM LINE FLOW ISOLATION CHECK FAILED TEST (NON-CONSERVATIVE).  
CAUSED BY STUCK INDICATOR ON THE OUTPUT OF D/P TRANSMITTER AND ERROR IN HEAD CORRECTION FACTOR.
- SSF** 02/08/89 LER# 34189005 50.72#: 14691 POWER: 100  
SYSTEM: REACTOR BUILDING  
DESC: TESTING SHOWED THAT IF A SEISMIC EVENT CAUSED A LOSS OF REACTOR BUILDING RAILROAD DOOR SEAL AIR  
SUPPLY, THE REQUIRED SECONDARY CONTAINMENT VACUUM COULD NOT BE MAINTAINED.
- SCRAM** 02/26/89 LER# 34189006 50.72#: 14863 POWER: 100  
DESC: TURBINE TRIP WHEN CONDUCTING TURBINE OVERSPEED TRIP TESTING CAUSED A REACTOR TRIP WHEN THE NUCLEAR  
SUPERVISING OPERATOR PRESSED THE OVERSPEED RESET OUT OF SEQUENCE.

TABLE 8.33 (CONT.)

FERMI 2 (CONT.)

PI EVENTS FOR 89-2

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.54	.50	.88	.80	1.01	.00	.53	.00
SCRAMS < 15% POWER	1	0	0	1	0	0	0	0
TOTAL SCRAMS	2	1	1	2	1	0	1	0
SAFETY SYSTEM ACTUATIONS	0	0	1	2	0	0	1	0
SIGNIFICANT EVENTS	1	0	0	1	1	0	1	0
SAFETY SYSTEM FAILURES	4	1	4	1	3	0	3	0
FORCED OUTAGE RATE (%)	NA	NA	2	0	61	8	28	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	NA	NA	.00	.00	3.02	.00	.53	.00
CRITICAL HOURS	649	1986	1134	1247	994	1950	1870	2183
COLLECTIVE RADIATION EXPOSURE	5	10	38	32	18	15	11	NA
CAUSE CODES:								
ADMINISTRATIVE	11	3	5	2	1	1	2	NA
LICENSED OPERATOR	3	0	6	1	0	2	1	NA
OTHER PERSONNEL	1	2	4	1	6	1	2	NA
MAINTENANCE	9	5	11	8	10	3	7	NA
A) MAINT PERSONNEL	3	1	6	1	3	0	2	NA
B) SURV AND TEST	4	3	5	3	3	2	3	NA
C) EQUIPM NT	3	2	2	4	2	2	0	NA
D) POTENTIAL MAINT	2	1	2	4	3	2	3	NA
DESIGN/INSTALLATION/FABRICATION	8	2	0	2	2	0	2	NA
EQUIPMENT FAILURE	0	0	1	0	0	0	0	NA



**TABLE 8.34  
FITZPATRICK**

**PI EVENTS FOR 88-3**

**SE** 08/22/88 LER# 33388008 50.72#: 13804 POWER: 0  
DESC: SRO OPERATING THE REFUELING BRIDGE SNAGGED THE OVERHEAD CRANE CABLE WITH THE MONORAIL HOIST WHICH HAD A NEW FUEL BUNDLE SUSPENDED FROM IT. (MORNING REPORT: 08/22/88)

**SSF** 09/01/88 LER# 33388008 50.72#: 13804 POWER: 0  
SYSTEM: PRIMARY CONTAINMENT/UNDETERMINED SYSTEM  
DESC: EXCESSIVE LEAKAGE OF PRIMARY CONTAINMENT PENETRATION, HPCI TURBOINE EXHAUST LINE. LEAKAGE IN EXCESS OF T.S. LIMIT OF 0.6 LA. CAUSE ATTRIBUTED TO WEAR OF ISOLATION VALVES.

**PI EVENTS FOR 88-4**

**SE** 10/24/88 LER# 33388009 50.72#: 13804 POWER: 0  
DESC: AREA COOLERS REQUIRED FOR ECCS OPERABILITY INOPERABLE BECAUSE OF SILT IMPEDING COOLING WATER FLOW.

**SSF** 10/24/88 LER# 33388009 50.72#: 13804 POWER: 0  
SYSTEM: REACTOR BUILDING ENVIRONMENTAL CONTROL SYSTEM  
DESC: PRESS. AND TEMP. MEASUREMENTS OF THE COOLING WATER SUPPLY TO ROOM COOLERS IN RX BUILDING CRESCENT AREA DELTA PRESS. VALUES OUTSIDE OF DESIGN SPECS. PROCEDURE ERROR.

**SSA** 10/31/88 LER# 33388011 50.72#: 13863 POWER: 0  
DESC: HIGH WINDS CAUSED A LOSS OF OFFSITE POWER, DIESEL STARTED AND LOAD BUSES.

**SSF** 11/17/88 LER# 33388013 50.72#: 13863 POWER: 0  
SYSTEM: LOW PRESSURE COOLANT INJECTION SYSTEM  
DESC: POTENTIAL INOPERABILITY OF CONTAINMENT SPRAY VALVES OF LPCI DUE TO MISINTERPRETATION OF PURCHASE SPECS. PRESSURIZED FLUID BETWEEN DISCS OF DOUBLE DISC GATE VALVES RESULTED IN D/P GREATER THAN DESIGN.

**SSF** 12/05/88 LER# 33388014 50.72#: 13863 POWER: 0  
SYSTEM: MEDIUM-VOLTAGE POWER SYSTEM - CLASS 1E  
DESC: FAILURE OF A CIRCUIT BREAKER TO TRIP PROMPTED AN INVESTIGATION WHICH RESULTED IN THE DISCOVERY OF MISALIGNMENT INTERNAL TO BREAKER LINKAGE. PROCEDUR ERROR, OTHER BREAKERS SUSCEPTIBLE TO SAME PROBLEM.

**PI EVENTS FOR 89-1**

**SSF** 02/28/89 LER# 33389001 50.72#: 14879 POWER: 100  
SYSTEM: LOW PRESSURE COOLANT INJECTION SYSTEM  
DESC: LOOSE TERMINAL BOX DISCOVERED ON A LPCI/RHR PUMP MOTOR (ONLY ONE BOLT HOLDING BOX ON MOTOR). ADDITIONAL INSPECTION REVEALED SAME PROBLEM ON ALL PUMP MOTORS IN THE LPCI/RHR AND LPCS SYSTEMS. CAUSED BY AGE HARDENING OF GASKET OR SHALLOW THREAD ENGAGEMENT

**SSF** 02/28/89 LER# 33389001 50.72#: 14879 POWER: 100  
SYSTEM: LOW PRESSURE CORE SPRAY SYSTEM  
DESC: LOOSE TERMINAL BOX DISCOVERED ON A LPCI/RHR PUMP MOTOR (ONLY ONE BOLT HOLDING BOX ON MOTOR). ADDITIONAL INSPECTION REVEALED SAME PROBLEM ON ALL PUMP MOTORS IN THE LPCI/RHR AND LPCS SYSTEMS. CAUSED BY AGE HARDENING OF GASKET OR SHALLOW THREAD ENGAGEMENT

**SSF** 03/02/89 LER# 33389002 50.72#: 14900 POWER: 100  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: HPCI WAS DECLARED INOPERABLE BY T.S. WHEN TURBINE STOP VALVE FAILED TO OPEN WITHIN THE IN-SERVICE INSPECTION REQUIRED TIME. AFTER DISCUSSION WITH VENDORS THE STROKE TIME WAS INCREASED AND THE VALVE OPENING TIME WAS ACCEPTED.

**SSF** 03/09/89 LER# 33389004 50.72#: 14900 POWER: 100  
SYSTEM: REACTOR BUILDING ENVIRONMENTAL CONTROL SYSTEM  
DESC: TEMPERATURE CONTROL VALVES FOR CW TO THE VENTILATION AND COOLING OF ELECTRICAL AREAS INCLUDING SAFETY AND NON-SAFETY RELATED EQUIPMENT WOULD CLOSE ON LOSS OF NON-SAFETY RELATED DESIGN INSTRUMENTATION. INCORRECT VALVES PURCHASED DURING ORIGINAL CONSTRUCTION

TABLE 8.34 (CONT.)

FITZPATRICK (CONT.)

PI EVENTS FOR 89-2

SSF 04/12/89 LER# 33389005 50.72#: 15300 POWER: 100

SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM

DESC: THE HPCI SYSTEM WAS DECLARED INOPERABLE WHEN A GROUND WAS DISCOVERED. GROUND WAS FOUND IN THE HPCI TURBINE GOVERNOR ACTUATOR.

SSF 04/19/89 LER# 33389006 50.72#: 15376 POWER: 100

SYSTEM: STANDBY LIQUID CONTROL SYSTEM

DESC: BOTH TRAINS OF THE STANDBY LIQUID CONTROL SYSTEM WERE RENDERED INOPERABLE. 'B' TRAIN WAS INOP. DUE TO A SLOW LEAK IN THE ACCUMULATOR CHARGING CONNECTION, 'A' TRAIN WAS INOP. WHEN ITS CHARGING CONNECTION WAS BROKEN DURING CONNECTION OF A PRESSURE GAUGE

SSF 05/17/89 LER# 33389008 50.72#: 15630 POWER: 100

SYSTEM: CONTAINMENT ISOLATION CONTROL SYSTEM

DESC: THE PRIMARY CONTAINMENT ISOLATION SYSTEM WAS DECLARED INOPERABLE WHEN THE INSTALLED TIME DELAY RELAYS IN THE HPCI AND RCIC LEAK DETECTION SYSTEM WERE FOUND TO ACTUATE IN 15 MINUTES. OUTSIDE DB LIMITS. TDRS HAD NEVER BEEN TESTED.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.49	.93	.00	.00	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	3	2	0	0	0	0	0	0
SAFETY SYSTEM ACTUATIONS	1	0	0	0	0	1	0	0
SIGNIFICANT EVENTS	0	0	0	0	1	1	0	0
SAFETY SYSTEM FAILURES	3	0	2	1	1	3	4	3
FORCED OUTAGE RATE (%)	11	3	0	0	0	42	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.99	.47	.00	.00	.00	.00	.00	.00
CRITICAL HOURS	2011	2149	1802	2183	1386	690	2160	2183
COLLECTIVE RADIATION EXPOSURE	63	53	139	87	224	335	58	NA
CAUSE CODES:								
ADMINISTRATIVE	1	1	1	1	0	4	0	NA
LICENSED OPERATOR	2	1	0	0	0	0	1	NA
OTHER PERSONNEL	1	2	1	0	1	0	0	NA
MAINTENANCE	7	5	2	3	2	3	2	NA
A) MAINT PERSONNEL	1	1	1	0	1	2	0	NA
B) SURV AND TEST	2	3	1	1	0	2	1	NA
C) EQUIPMENT	4	1	0	2	2	0	1	NA
D) POTENTIAL MAINT	3	1	0	2	1	0	0	NA
DESIGN/INSTALLATION/FABRICATION	2	0	0	1	0	4	2	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

**TABLE 8.35  
FORT CALHOUN**

**PI EVENTS FOR 88-3**

**SSF** 08/16/88 LER# 28588019 50.72#: POWER: 80  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: DESIGN ERROR IN DIESEL ROOM DAMPER CONTROL CIRCUITRY COULD HAVE RENDERED DIESEL INOPERABLE.

**PI EVENTS FOR 88-4**

**SSA** 10/03/88 LER# 28588024 50.72#: 13609 POWER: 0  
DESC: MOMENTARY LOW VOLTAGE CONDITION ON 1A4 4160V SAFEGUARDS BUS WHEN EO OPENED SWITCHGEAR CABINETS AND A DIESEL START.

**SSF** 10/20/88 LER# 28588028 50.72#: POWER: 0  
SYSTEM: ESSENTIAL AIR SYSTEM  
DESC: CHECK VALVE ON AIR ACCUMULATOR FOR STEAM ISOLATION VALVE WAS LEAKING. SAFETY FUNCTION OF ACCUMULATOR RENDERED INOPERABLE. POTENTIAL PATH FROM S/G TO ATMOSPHERE. PERSONNEL ERROR CAUSED.

**SSF** 11/01/88 LER# 28588032 50.72#: 13877 POWER: 0  
SYSTEM: LOW PRESSURE SAFETY INJECTION SYSTEM  
DESC: RECIRC FLOW CAPABILITIES ASSOCIATED WITH SAFETY INJECTION WERE DISCOVERED TO BE INADEQUATE. FLOW IS CHOKED BY TWO VALVES LOCATED IN RECIRC PIPING.

**PI EVENTS FOR 89-1**

NONE

**PI EVENTS FOR 89-2**

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	0	0	0	0	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	1	0	0
SIGNIFICANT EVENTS	1	0	0	1	0	0	0	0
SAFETY SYSTEM FAILURES	1	0	0	2	1	2	0	0
FORCED OUTAGE RATE (%)	0	0	0	0	0	0	0	9
EQUIP. FORCED OUTAGS/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.00
CRITICAL HOURS	2208	2209	2184	2183	2143	0	1479	2022
COLLECTIVE RADIATION EXPOSURE	22	21	20	17	30	213	48	NA
CAUSE CODES:								
ADMINISTRATIVE	2	1	3	2	3	5	5	NA
LICENSED OPERATOR	1	1	0	0	0	0	0	NA
OTHER PERSONNEL	1	4	4	3	2	7	2	NA
MAINTENANCE	3	5	5	6	5	8	7	NA
A) MAINT PERSONNEL	1	1	2	2	1	3	0	NA
B) SURV AKD TEST	2	4	4	2	1	3	7	NA
C) EQUIPMENT	1	0	1	0	1	1	0	NA
D) POTENTIAL MAINT	1	0	0	3	2	2	0	NA
DESIGN/INSTALLATION/FABRICATION	0	1	1	1	3	4	1	NA
EQUIPMENT FAILURE	0	0	0	1	1	0	0	NA

**TABLE 8.36**  
**FORT ST. VRAIN**

**PI EVENTS FOR 88-3**

**SSF** 07/06/88 LER# 26788011 50.72#: 12730 POWER: 0  
 SYSTEM: REACTOR VESSEL SYSTEM  
 DESC: CORE SUPPORT FLOOR VENT VALVE FOUND TO BE IN AN IMPROPER POSITION AND WAS CLOSED FAR ENOUGH TO PREVENT THE CORE SUPPORT CONTROLLER FROM OPERATING. STEM/DISC SEPARATED, POTENTIAL SAFETY SYSTEM FAILURE.

**PI EVENTS FOR 88-4**

NONE

**PI EVENTS FOR 89-1**

**SSF** 03/17/89 LER# 26789003 50.72#: 15039 POWER: 0  
 SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
 DESC: THE EMER ON-SITE DG'S MAY NOT HAVE BEEN ABLE TO OPERATE TO DESIGN RQMT'S DUE TO DISLODGING OF 8 OF 90 UNROLLED CYL HEAD CW FLOW DIRECTORS. THE UNROLLED PARTS RESULTED FROM LOCAL VENDOR REFURBISHMENT USING MANUF. O&M, WHICH CALLED FOR PRESSING ONLY.

**PI EVENTS FOR 89-2**

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	2.02	.00	.65	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	1	0	1	0	0	0	0
SAFETY SYSTEM ACTUATIONS	0	2	0	0	0	0	0	0
SIGNIFICANT EVENTS	0	1	0	1	0	0	0	0
SAFETY SYSTEM FAILURES	0	0	0	0	1	0	1	0
FORCED OUTAGE RATE (%)	71	90	4	42	0	0	100	29
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	4.27	2.02	.93	1.31	.00	.00	.00	1.52
CRITICAL HOURS	703	496	2149	1530	119	0	193	1971
COLLECTIVE RADIATION EXPOSURE	1	0	0	0	0	0	1	NA
CAUSE CODES:								
ADMINISTRATIVE	NA	NA	NA	NA	NA	NA	NA	NA
LICENSED OPERATOR	NA	NA	NA	NA	NA	NA	NA	NA
OTHER PERSONNEL	NA	NA	NA	NA	NA	NA	NA	NA
MAINTENANCE	NA	NA	NA	NA	NA	NA	NA	NA
A) MAINT PERSONNEL	NA	NA	NA	NA	NA	NA	NA	NA
B) SURV AND TEST	NA	NA	NA	NA	NA	NA	NA	NA
C) EQUIPMENT	NA	NA	NA	NA	NA	NA	NA	NA
D) POTENTIAL MAINT	NA	NA	NA	NA	NA	NA	NA	NA
DESIGN/INSTALLATION/FABRICATION	NA	NA	NA	NA	NA	NA	NA	NA
EQUIPMENT FAILURE	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 8.37

GINNA

PI EVENTS FOR 88-3

SSA 07/16/88 LER# 24488006 50.72#: 12866 POWER: 100  
 DESC: OFFSITE POWER SOURCE LOST WHEN TRANSFORMER EXPLODED DIESEL STARTED.

PI EVENTS FOR 88-4

NONE

PI EVENTS FOR 89-1

NONE

PI EVENTS FOR 89-2

SSA 05/06/89 LER# 24489002 50.72#: 15552 POWER: 0  
 DESC: PROCEDURE IDENTIFIED WRONG TERMINAL TO BE DISCONNECTED CAUSING SUPPLY BREAKER TO VITAL BUS '14' TO TRIP. DIESEL STARTED AND LOADED BUS.

SSA 05/18/89 LER# 24489003 50.72#: 15640 POWER: 0  
 DESC: 'A' TRAIN S1 LOGIC SIGNAL DURING A SAFEGUARD LOGIC TEST CAUSING 'A' TRAIN EQUIPMENT NOT IN PULL TO LOCK TO OPERATE.

SCRAM 06/01/89 LER# 24489004 50.72#: 15764 POWER: 53  
 DESC: TURBINE/REACTOR TRIP DUE TO INCOMPLETE SYSTEM RESET AFTER POST MODIFICATION TESTING.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.86	.47	.00	.00	.00	1.41
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	1	1	0	0	0	1
SAFETY SYSTEM ACTUATIONS	0	0	0	1	1	0	0	2
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	0	1	0	0	0	0	0	0
FORCED OUTAGE RATE (%)	0	0	17	4	1	0	1	12
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.86	.47	.46	.00	.55	.00
CRITICAL HOURS	2208	2209	1166	2111	2193	2209	1806	708
COLLECTIVE RADIATION EXPOSURE	16	13	226	12	13	21	124	NA
CAUSE CODES:								
ADMINISTRATIVE	0	0	1	1	1	1	0	NA
LICENSED OPERATOR	0	0	1	0	0	0	0	NA
OTHER PERSONNEL	0	1	2	0	1	0	0	NA
MAINTENANCE	0	0	3	1	4	0	0	NA
A) MAINT PERSONNEL	0	0	1	0	1	0	0	NA
B) SURV AND TEST	0	0	1	0	0	0	0	NA
C) EQUIPMENT	0	0	2	1	2	0	0	NA
D) POTENTIAL MAINT	0	0	0	1	2	0	0	NA
DESIGN/INSTALLATION/FABRICATION	0	2	0	0	1	0	0	NA
EQUIPMENT FAILURE	0	0	0	1	2	0	0	NA

**TABLE 8.38**

**GRAND GULF**

**PI EVENTS FOR 88-3**

**SCRAM** 08/15/88 LER# 41688012 50.72#: 13202 POWER: 100  
DESC: REACTOR TRIP DURING AN ELECTRICAL STORM WHEN LIGHTNING CAUSED HIGH APRM SIGNAL.

**SCRAM** 09/05/88 LER# 41688013 50.72#: 13390 POWER: 100  
DESC: OPENING A BREAKER FOR A TAGOUT CAUSED CONTAINMENT INSTRUMENT AIR VALVES TO SHUT AND CONTROL RODS TO DRIFT INTO THE CORE. AUTO SCRAM JUST BEFORE MANUAL SCRAM ON HIGH SCRAM DISCHARGE VOLUME TANK LEVEL.

**SE** 09/15/88 LER# 41688015 50.72#: 13497 POWER: 0  
DESC: INTERNAL DIFFUSER PLATE (GUIDE VANE) OF DM 2 EDG DROPPED ONTO THE INTERCOOLER CAUSING IT TO LEAK. THE DIV 1 INTERNAL DIFFUSER PLATE HAS CRACK INDICATION.

**SSF** 09/15/88 LER# 41688015 50.72#: 13497 POWER: 95  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: POTENTIAL FAILURE OF BOTH EMERGENCY DIESELS GENERATORS. RUPTURED TUBES DISCOVERED IN DIVISION 2 EDG. DESIGN ERROR OF INTERCOOLER ADAPTER PLATE ALLOWED FOR IT TO MOVE CAUSING FATIGUE.

**PI EVENTS FOR 88-4**

**SSA** 10/10/88 LER# 41688019 50.72#: 13659 POWER: 100  
DESC: HPCS INJECTED - DUE TO KEYING A TWO-WAY RADIO IN THE VICINITY OF THE LOW LEVEL INSTRUMENT TRANSMITTERS.

**SCRAM** 10/10/88 LER# 41688019 50.72#: 13659 POWER: 100  
DESC: SCRAM AFTER HPCS INJECTED - DUE TO KEYING A TWO-WAY RADIO IN THE VICINITY OF THE LOW LEVEL INSTRUMENT TRANSMITTERS.

**SSF** 12/06/88 LER# 41688020 50.72#: POWER: 100  
SYSTEM: HIGH PRESSURE CORE SPRAY SYSTEM  
DESC: HPCS DECLARED INOPERABLE WHEN MIN FLOW VALVE BREAKER TRIPPED, COULD NOT BE DUPLICATED. ECCS DIV 1, LPCS, AND "A" LPCI WERE INOPERABLE AT THIS TIME DUE TO PLANNED MAINT. TECH. SPEC. 3.0.3 ENTERED.

**PI EVENTS FOR 89-1**

**SSA** 03/27/89 LER# 41689001 50.72#: 15127 POWER: 0  
DESC: MOMENTARY POWER LOSS OCCURRED WHEN A MANUAL DISCONNECT WAS OPENED. DIESEL OUT-OF-SERVICE FOR MAINTENANCE SO DID NOT START ON LOW VOLTAGE ON THE DIVISION 1 ESF BUS.

**PI EVENTS FOR 89-2**

**SSF** 04/20/89 LER# 41689004 50.72#: 15399 POWER: 0  
SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
DESC: THE "A" TRAIN RHR PUMP TRIPPED AS A RESULT OF A FALSE SUCTION TRIP SIGNAL GENERATED WHEN A RCIC FUSE WAS REPLACED. THE "B" TRAIN RHR WAS OUT OF SERVICE AT THIS TIME. RHR RESTORED IN 25 MINS. CONDITION COULD ONLY OCCUR WITH RCIC IN TRIPPED CONDITION.

**SCRAM** 05/05/89 LER# 50.72#: 15542 POWER: 5  
DESC: SHUTTING DOWN TO REPAIR MFW ISOLATION VALVE WHEN STARTUP FRV STARTED MALFUNCTIONING AND A SCRAM ON LOW REACTOR LEVEL OCCURRED.

**SSF** 05/23/89 LER# 41689008 50.72#: 15686 POWER: 0  
SYSTEM: SECONDARY CONTAINMENT/UNDETERMINED SYSTEM  
DESC: TWO REDUNDANT SECONDARY CONTAINMENT ISOLATION DAMPERS FAILED TO CLOSE. FAILURE OF THE DAMPERS TO CLOSE COULD ADVERSELY AFFECT THE SBOGTS DRAWDOWN TIME. CAUSE NOT DETERMINED, LICENSEE IS INVESTIGATING.

TABLE 8.38 (CONT.)

GRAND GULF (CONT.)

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.47	.00	1.52	.00	.93	.46	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	1
TOTAL SCRAMS	1	0	3	0	2	1	0	1
SAFETY SYSTEM ACTUATIONS	1	1	1	0	0	1	1	0
SIGNIFICANT EVENTS	0	0	0	0	1	0	0	0
SAFETY SYSTEM FAILURES	0	0	0	0	1	1	0	2
FORCED OUTAGE RATE (%)	6	0	11	0	7	1	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.47	.00	1.52	.00	.93	.00	.00	.00
CRITICAL HOURS	2129	891	1970	2183	2154	2191	1829	1025
COLLECTIVE RADIATION EXPOSURE	24	315	54	20	36	37	143	NA
CAUSE CODES:								
ADMINISTRATIVE	1	5	5	0	2	1	0	NA
LICENSED OPERATOR	0	1	0	0	1	0	0	NA
OTHER PERSONNEL	1	2	4	0	2	1	1	NA
MAINTENANCE	1	9	8	0	2	2	1	NA
A) MAINT PERSONNEL	0	1	2	0	0	0	1	NA
B) SURV AND TEST	0	6	3	0	1	1	0	NA
C) EQUIPMENT	0	0	3	0	0	0	1	NA
D) POTENTIAL MAINT	1	2	4	0	1	1	0	NA
DESIGN/INSTALLATION/FABRICATION	2	0	1	0	2	0	0	NA
EQUIPMENT FAILURE	0	1	1	0	0	0	1	NA

**TABLE 8.39  
HADDAM NECK**

**PI EVENTS FOR 86-3**

**NONE**

**PI EVENTS FOR 88-4**

**SSF** 12/16/88 LER# 21388022 50.72#: 14270 POWER: 100  
SYSTEM: CONTAINMENT FAN COOLING SYSTEM  
DESC: HEAT LOAD ON CONTAINMENT COOLING SYSTEM WOULD BE EXCESSIVE AND CAUSE FLASHING OF ESW DISCHARGE AND CHOKE FLOW IF RIVER WATER > 85 DEG. UNIT HAS OPERATED UP TO 90 DEG. IN PAST.

**PI EVENTS FOR 89-1**

**SSF** 01/25/89 LER# 21389004 50.72#: POWER: 100  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: DESIGN REVIEW OF THE REQUIRED CAPACITY OF THE EMERGENCY DIESEL GENERATOR FUEL IN THE EVENT OF A DESIGN BASIS FLOOD REVEALED THAT THE EMERGENCY DIESEL GENERATORS WOULD RUN APPROXIMATELY 44 HOURS, NOT 160 HOURS AS REQUIRED.

**SSF** 03/17/89 LER# 21389002 50.72#: 15344 POWER: 100  
SYSTEM: AUXILIARY/EMERGENCY FEEDWATER SYSTEM  
DESC: DESIGN DEFICIENCY IDENTIFIED IN THE AUX. FEEDWATER SYSTEM SUCH THAT THE SYSTEM COULD BE COMPROMISED DURING CERTAIN DBAS DUE TO POSTULATED FAILURES.

**PI EVENTS FOR 89-2**

**SSF** 04/13/89 LER# 21389005 50.72#: 15315 POWER: 100  
SYSTEM: CONTAINMENT SPRAY SYSTEM  
DESC: DUE TO INSTRUMENT UNCERTAINTY OF THE CONTAINMENT PRESSURE INSTRUMENTATION THE EOPS WOULD ALLOW CONTAINMENT SPRAY ACTUATION BELOW THE REQUIRED 40 PSIG WHICH IS BEYOND THE DESIGN BASIS. THIS IS A PROCEDURAL ERROR.

**SSF** 04/14/89 LER# 21389006 50.72#: 15330 POWER: 100  
SYSTEM: SECONDARY CONTAINMENT/UNDETERMINED SYSTEM  
DESC: CONTAINMENT INTEGRITY COULD NOT BE MAINTAINED DUE TO FAILURE OF THE TWO HEATING STEAM CONTAINMENT ISOLATION VALVES TO OPERATE DURING SURVEILLANCE TESTING.

**SSF** 04/21/89 LER# 21389007 50.72#: 15404 POWER: 100  
SYSTEM: STEAM GENERATING SYSTEM  
DESC: AS A RESULT OF A WESTINGHOUSE ANALYSIS, 53 STEAM GENERATOR HOT LEG TUBE PLUGS WERE IDENTIFIED AS BEING SUSCEPTIBLE TO CIRCUMFERENTIAL STRESS CORROSION CRACKING. INDICATES THAT PLUG FAILURE COULD OCCUR WITHOUT WARNING. IMPROPER MANUFACTURE OF PLUGS.

**SSF** 04/25/89 LER# 21389008 50.72#: 15435 POWER: 100  
SYSTEM: REACTOR VESSEL SYSTEM  
DESC: AN ERROR IN THE LBLOCA ANALYSIS WAS DISCOVERED SUCH THAT PEAK CLAD TEMPERATURES WOULD EXCEED THE IAC LIMITS. A NON CONSERVATIVE REACTOR VESSEL VOLUME WAS USED IN THE ANALYSIS, WHICH RESULTED IN TOO HIGH A LINEAR HEAT GENERATION T.S. LIMIT.

**SSF** 05/23/89 LER# 21389009 50.72#: 15694 POWER: 100  
DESC: OPERATOR OPENED WRONG BREAKER (EMERGENCY TIE VERSUS DG OUTPUT) DIESEL WHICH WAS ALREADY RUNNING FOR A TEST CLOSED BACK ONTO THE EMERGENCY BUS.



TABLE 8.39 (CONT.)  
HADDAM NECK (CONT.)

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.67	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	2	0	0	0	0	0
TOTAL SCRAMS	0	0	2	1	0	0	0	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	0	1
SIGNIFICANT EVENTS	0	0	0	1	0	0	0	0
SAFETY SYSTEM FAILURES	1	0	3	2	0	1	2	4
FORCED OUTAGE RATE (%)	0	0	0	0	0	0	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.00
CRITICAL HOURS	420	0	258	1502	2208	2208	2160	2183
COLLECTIVE RADIATION EXPOSURE	529	178	170	39	13	14	17	NA
CAUSE CODES:								
ADMINISTRATIVE	1	2	0	1	1	0	2	NA
LICENSED OPERATOR	0	0	1	1	0	0	0	NA
OTHER PERSONNEL	2	2	4	2	1	0	0	NA
MAINTENANCE	3	3	4	4	3	2	0	NA
A) MAINT PERSONNEL	1	2	3	1	0	0	0	NA
B) SURV AND TEST	1	0	2	2	1	0	0	NA
C) EQUIPMENT	1	1	1	1	2	2	0	NA
D) POTENTIAL MAINT	1	1	0	1	1	2	0	NA
DESIGN/INSTALLATION/FABRICATION	4	0	5	2	1	1	3	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

## TABLE 8.40

### HATCH 1

#### PI EVENTS FOR 88-3

**SSF** 08/26/88 LER# 32188012 50.72#: 13296 POWER: 100  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: HIGH PRESSURE COOLANT INJECTION SYSTEM FAILED SURVEILLANCE TEST, FAILED SPEED CONTROLLER, ONE TRAIN OF LPSI WAS OUT OF SERVICE FOR MAINTENANCE.

**SSA** 09/04/88 LER# 32188013 50.72#: 13378 POWER: 100  
DESC: FAULTY MFP SPEED CONTROLLER CAUSED LOW REACTOR LEVEL SCRAM AND HPCI AND RCIC START.

**SCRAM** 09/04/88 LER# 32188013 50.72#: 13378 POWER: 100  
DESC: A BAD SOLDER CONNECTION CAUSED A MFP SPEED CONTROLLER FAILURE LEADING TO A MFP TRIP AND RESULTED IN A LOW REACTOR LEVEL AND A REACTOR TRIP.

#### PI EVENTS FOR 88-4

**SSF** 10/03/88 LER# 32188014 50.72#: 13662 POWER: 0  
SYSTEM: CONTAINMENT ISOLATION CONTROL SYSTEM  
DESC: EXCESSIVE LEAK RATES OF VARIOUS PRIMARY CONTAINMENT ISOLATION PENETRATIONS (28 PENETRATIONS), COULD HAVE PREVENTED PRIMARY CONTAINMENT ISOLATION CONTROL SYSTEM FROM FULFILLING ITS SAFETY FUNCTION

**SSF** 10/26/88 LER# 32188015 50.72#: 13821 POWER: 0  
SYSTEM: AUTOMATIC DEPRESSURIZATION SYSTEM  
DESC: DESIGN ERROR ADS POWER SUPPLY CIRCUIT, LOSS OF "A" BATTERY WILL CAUSE LOSS OF "B" ADS LOGIC AND "A" TRAIN TRANSMITTER TRIP SYSTEM (ATTS) SENSOR INPUTS. AUTO ADS INITIATION WOULD BE LOST.

**SSF** 12/09/88 LER# 32188017 50.72#: 14193 POWER: 21  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: THE HPCI PUMP COULD NOT ATTAIN RATED FLOW DURING AN OPERABILITY TEST. HPCI DECLARED INOPERABLE. FLOW CONTROLLER NULL VOLTAGE SETTINGS WERE FOUND TO BE SET INCORRECTLY, CAUSED BY PERSONNEL ERROR.

**SSA** 12/17/88 LER# 32189018 50.72#: 14276 POWER: 0  
DESC: HPCI MANUALLY STARTED AFTER SCRAM TO CONTROL RX WATER LEVEL.

**SSA** 12/17/88 LER# 32188018 50.72#: 14276 POWER: 85  
DESC: "C" AND "D" 4160 BUSES LOST WHEN STARTUP TRANSFORMER DID NOT AUTO TRANSFER. DIESELS STARTED BUT DID NOT LOAD.

**SCRAM** 12/17/88 LER# 32188018 50.72#: 14276 POWER: 85  
DESC: TURBINE TRIP ON LOW EHC PRESSURE CAUSED SCRAM DUE TO UNIT 2 OPERATOR TAGGING OUT UNIT 1 EHC INSTEAD OF UNIT 2 EHC.

**SSF** 12/19/88 LER# 32188019 50.72#: POWER: 0  
SYSTEM: PRIMARY CONTAINMENT/UNDETERMINED SYSTEM  
DESC: PROCEDURE ERROR COULD HAVE RESULTED IN ISOLATION TIMES OF PRIMARY CONTAINMENT VALVES TO BE EXCESSIVE.

#### PI EVENTS FOR 89-1

**SSF** 03/29/89 LER# 32189006 50.72#: 15154 POWER: 100  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: LOSS OF CONTROL POWER TO THE HPCI SYSTEM CAUSED BY FAILURE OF INVERTER DUE TO A DIODE FAILURE IN THE INVERTER. HPCI DECLARED INOPERABLE.

#### PI EVENTS FOR 89-2

**SSF** 06/08/89 LER# 32189008 50.72#: POWER: 100  
SYSTEM: EMERGENCY ON-SITE POWER SUPPLY SYSTEM  
DESC: INADEQUATE ANALYSIS OF THE FSAR RESULTED IN INSUFFICIENT TECH. SPEC. REQUIREMENTS FOR THE AMOUNT OF ON-SITE FUEL OIL TO SUPPORT FOUR EDGs FOR SEVEN DAYS UNDER ACCIDENT CONDITIONS.

TABLE 8.40 (CONT.)

HATCH 1 (CONT.)

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.92	.00	.47	1.65	.47	1.90	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	2	0	1	2	1	1	0	0
SAFETY SYSTEM ACTUATIONS	2	0	0	0	1	2	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	2	1	1	1	1	4	1	1
FORCED OUTAGE RATE (%)	3	0	2	44	2	18	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.92	.00	.47	.00	.47	1.90	.00	.00
CRITICAL HOURS	2169	2209	2144	1210	2128	527	2160	2183
COLLECTIVE RADIATION EXPOSURE	49	59	198	73	69	361	57	NA
CAUSE CODES:								
ADMINISTRATIVE	2	2	2	4	2	3	3	NA
LICENSED OPERATOR	1	1	0	0	0	0	1	NA
OTHER PERSONNEL	0	0	0	2	0	3	1	NA
MAINTENANCE	4	2	3	4	2	5	4	NA
A) MAINT PERSONNEL	1	0	0	1	1	2	0	NA
B) SURV AND TEST	1	1	2	1	1	2	4	NA
C) EQUIPMENT	3	0	1	2	0	1	0	NA
D) POTENTIAL MAINT	2	1	1	2	0	1	0	NA
DESIGN/INSTALLATION/FABRICATION	3	0	1	1	2	2	0	NA
EQUIPMENT FAILURE	1	0	0	0	1	0	1	NA

**TABLE 8.41**

**HATCH 2**

**PI EVENTS FOR 88-3**

**SSA** 08/05/88 LER# 36688020 50.72#: 13120 POWER: 100  
 DESC: DURING MAINTENANCE BLOWN FUSE IN MFW CONTROLLER PANEL CAUSED LOSS OF FEED LOW LEVEL HPCI AND RCIC INITIATED.

**SCRAM** 08/05/88 LER# 36689020 50.72#: 13120 POWER: 100  
 DESC: DURING MAINTENANCE, A BLOWN FUSE CAUSED A LOSS OF MAIN FEEDWATER SCRAM ON LOW-LOW REACTOR LEVEL DUE TO POOR DESIGN WITH ONE FUSE CONTAINING 12 INSTRUMENTS.

**PI EVENTS FOR 88-4**

**SSF** 10/26/88 LER# 32188015 50.72#: 13821 POWER: 100  
 SYSTEM: AUTOMATIC DEPRESSURIZATION SYSTEM  
 DESC: DESIGN ERROR ADS POWER SUPPLY CIRCUIT. LOSS OF "A" BATTERY WILL CAUSE LOSS OF "B" ADS LOGIC AND "A" TRAIN TRANSMITTER TRIP SYSTEM (ATTS) SENSOR INPUTS. AUTO ADS INITIATION WOULD BE LOST.

**SSF** 12/05/88 LER# 36688025 50.72#: 14153 POWER: 100  
 SYSTEM: EMERGENCY/STANDBY GAS TREATMENT SYSTEM  
 DESC: DESIGN ERROR DISCOVERED WHERE AUTO START OF SBGTS WOULD NOT AUTO START ON LOSS OF OFFSITE POWER AND DIESEL GENERATOR START. JUMPER WAS INSTALLED TO TEMPORARILY CORRECT

**PI EVENTS FOR 89-1**

**NONE**

**PI EVENTS FOR 89-2**

**SSF** 06/08/89 LER# 32189008 50.72#: POWER: 89  
 SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
 DESC: INADEQUATE ANALYSIS OF THE FSAR RESULTED IN INSUFFICIENT TECH. SPEC. REQUIREMENTS FOR THE AMOUNT OF ON-SITE FUEL OIL TO SUPPORT FOUR EDGS FOR SEVEN DAYS UNDER ACCIDENT CONDITIONS.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.00	.00	.00	2.04	.46	.00	.00	.00
SCRAMS < 15% POWER	0	0	1	0	0	0	0	0
TOTAL SCRAMS	2	0	1	3	1	0	0	0
SAFETY SYSTEM ACTUATIONS	2	0	0	1	0	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	3	2	3	2	0	2	0	1
FORCED OUTAGE RATE (%)	10	0	6	45	2	1	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	1.50	.00	.00	.00	.00	.48	.00	.00
CRITICAL HOURS	2005	2209	616	1471	2178	2095	2160	2183
COLLECTIVE RADIATION EXPOSURE	49	59	198	73	69	361	57	NA

**CAUSE CODES:**

ADMINISTRATIVE	2	1	6	6	1	1	2	NA
LICENSED OPERATOR	1	0	0	1	0	0	0	NA
OTHER PERSONNEL	3	2	4	1	1	1	1	NA
MAINTENANCE	8	4	9	10	4	2	3	NA
A) MAINT PERSONNEL	3	1	2	1	2	1	0	NA
B) SURV AND TEST	3	2	8	6	1	0	3	NA
C) EQUIPMENT	6	1	2	2	1	2	0	NA
D) POTENTIAL MAINT	4	1	2	3	1	1	0	NA
DESIGN/INSTALLATION/FABRICATION	2	0	1	2	2	2	0	NA
EQUIPMENT FAILURE	1	0	0	0	1	0	0	NA

TABLE 8.42

HOPE CREEK

PI EVENTS FOR 88-3

**SSF** 07/19/88 LER# 35488017 50.72#: 12882 POWER: 100  
SYSTEM: MAIN STEAM ISOLATION VALVES  
DESC: THE MSIV SEALING SYSTEM INOPERABLE. WITH ONE TRAIN OUT OF SERVICE, THE PRESSURE TRANSMITTER ON OTHER TRAIN FAILED CHANNEL CHECK. SYSTEM DESIGNED TO LIMIT LEAKAGE OF FISSION PRODUCTS AFTER DBA-LOCA.

**SSA** 07/28/88 LER# 35488019 50.72#: 13000 POWER: 100  
DESC: "C" CORE SPRAY PUMP STARTED DUE TO A HUMAN FACTORS TESTING DESIGN DEFICIENCY WHEN TESTING REACTOR VESSEL LEVEL CHANNELS.

**SSF** 07/30/88 LER# 35488021 50.72#: 13062 POWER: 100  
SYSTEM: EMERGENCY/STANDBY GAS TREATMENT SYSTEM  
DESC: INTERNAL INSPECTION OF FILTRATION RECIRCULATION VENTILATION SYSTEM DUCTWORK HAS REVEALED CRACKING WHICH COULD LEAD TO SYSTEM FAILURE.

**SSA** 08/26/88 LER# 35488022 50.72#: 13301 POWER: 100  
DESC: HPCI AND RCIC STARTED AND INJECTED ON LOW VESSEL LEVEL AFTER SCRAM.

**SCRAM** 08/26/88 LER# 35488022 50.72#: 13301 POWER: 100  
DESC: DC MOTOR FAILED TO DRIVE BACK THRUST BEARING WEAR INDICATOR SO WHEN TEST BUTTON RELEASED, THRUST BEARING INDICATOR INDICATED FAILED THRUST BEARING, CAUSE TURBINE TRIP/REACTOR TRIP.

**GSF** 09/30/88 LER# 35488025 50.72#: POWER: 98  
SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
DESC: BOTH TRAINS OF THE CONTROL ROOM EMERGENCY FILTRATION SYSTEM INOPERABLE. A DESIGN CHANGE WAS MADE TO AN AREA OUTSIDE OF THE CONTROL ROOM (OUTSIDE DP CELL LEG LOCATED HERE), PROVIDED FALSE DP

PI EVENTS FOR 88-4

**SSA** 10/15/88 LER# 35488027 50.72#: 13725 POWER: 100  
DESC: HPCI AND RCIC INITIATED ON LEVEL 2 LOW REACTOR LEVEL AFTER SCRAM.

**SCRAM** 10/15/88 LER# 35488027 50.72#: 13725 POWER: 100  
DESC: HPPS TRIPPED ON SPURIOUS HIGH DISCHARGE PRESSURE CAUSING LOW REACTOR LEVEL SCRAM.

**SSF** 10/18/88 LER# 35488028 50.72#: POWER: 100  
SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
DESC: WITH "A" TRAIN CREF SYSTEM OUT OF SERVICE FOR MAINTENANCE, THE "B" TRAIN CREF TRIPPED SEVERAL TIMES UNTIL IT WAS DISCOVERED THAT THE OUTLET DAMPER HAD FAILED TO OPEN.

**SSA** 11/01/88 LER# 35488029 50.72#: 13874 POWER: 100  
DESC: HPCI AND RCIC STARTED ON LOW RX LEVEL AFTER THE SCRAM.

**SCRAM** 11/01/88 LER# 35488029 50.72#: 13874 POWER: 100  
DESC: EXCITER FIELD BRUSH HOLDERS CONTACTED THE ROTOR DUE TO A FAILURE OF THE HOLDER CAUSING A LOSS OF FIELD TURBINE TRIP SCRAM AND A REACTOR TRIP.

**SSF** 11/04/88 LER# 35488030 50.72#: POWER: 0  
SYSTEM: REACTOR RECIRCULATION SYSTEM  
DESC: PRESSURE BOUNDARY LEAKAGE DISCOVERED ON "B" RECIRC PUMP DISCHARGE VALVE AND THE "A" RECIRC PUMP DISCHARGE VALVE. CAUSED BY OVERSTRESSED WELDS.

PI EVENTS FOR 89-1

NONE

TABLE 9.42 (CONT.)

HOPE CREEK (CONT.)

PI EVENTS FOR 89-2

- SSF** 04/06/89 LER# 35489007 50.72#: POWER: 100  
 SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
 DESC: BOTH TRAINS OF THE CREVS SYSTEM INOPERABLE. TRAIN A DUE TO A SEAL FAILURE IN THE ASSOCIATED CHILLER AND TRAIN B DUE TO A FAILED DAMPER.
- SSA** 04/14/89 LER# 35489009 50.72#: 15331 POWER: 100  
 DESC: A VOLTAGE TRANSIENT OCCURRED WHILE RESTORING "C" CHANNEL INSTRUMENT TOPAZ INVERTER. MAJOR ECC COMPONENTS STARTED BUT DIESEL GENERATOR CLASS 3 AND NOT DUE TO A LOW BUS VOLTAGE.
- SSA** 04/14/89 LER# 35489009 50.72#: 15331 POWER: 100  
 DESC: A VOLTAGE TRANSIENT OCCURRED WHILE RESTORING "C" CHANNEL INSTRUMENT TOPAZ INVERTER. MAJOR ECC COMPONENTS STARTED BUT DIESEL GENERATOR CLASS 3 AND NOT DUE TO A LOW BUS VOLTAGE.
- SSF** 04/14/89 LER# 35489009 50.72#: 15331 POWER: 100  
 SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
 DESC: HPCI SYSTEM DECLARED INOPERABLE WHEN A CHANNEL "C" 125VDC BATTERY CHARGER WAS MISTAKENLY SELECTED TO EQUALIZE MODE. THE ECCS INSTRUMENTATION INVERTER TRIPPED. THE REDUNDANT CH. "C" 125VDC BATTERY CHARGER WAS ON EQUALIZE CHARGE.
- SSF** 06/07/89 LER# 35489012 50.72#: 15797 POWER: 100  
 SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
 DESC: HPCI SYSTEM DECLARED INOPERABLE WHEN IT WAS TAKEN OUT OF SERVICE IN ORDER TO REPAIR A MINOR STEAM LEAK ON THE OUTBOARD STEAM SUPPLY MOTOR OPERATED VALVE.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.68	.62	.00	.53	.46	1.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	3	1	0	1	1	2	0	0
SAFETY SYSTEM ACTUATIONS	5	0	0	2	2	2	0	2
SIGNIFICANT EVENTS	0	1	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	2	0	0	2	3	2	0	3
FORCED OUTAGE RATE (%)	7	22	0	5	3	11	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	1.12	2.49	.00	1.06	.46	1.50	.57	.00
CRITICAL HOURS	1789	1609	1045	1891	2159	1994	1758	2183
COLLECTIVE RADIATION EXPOSURE	NA	NA	215	35	18	29	117	NA
CAUSE CODES:								
ADMINISTRATIVE	6	2	5	3	3	2	5	NA
LICENSED OPERATOR	0	0	0	1	0	0	1	NA
OTHER PERSONNEL	4	2	1	3	2	6	0	NA
MAINTENANCE	12	3	5	6	6	11	5	NA
A) MAINT PERSONNEL	5	1	2	4	0	4	1	NA
B) SURV AND TEST	4	1	3	1	5	5	3	NA
C) EQUIPMENT	3	0	1	2	1	2	0	NA
D) POTENTIAL MAINT	4	1	1	1	1	2	1	NA
DESIGN/INSTALLATION/FABRICATION	3	4	3	5	5	2	0	NA
EQUIPMENT FAILURE	1	0	0	0	0	2	0	NA

**TABLE 8.43  
INDIAN POINT 2**

**FI EVENTS FOR 88-3**

NONE

**PI EVENTS FOR 88-4**

**SSF** 11/02/88 LER# 24788017 50.72#: 13895 POWER: 100  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: LICENSEE DISCOVERED POTENTIAL FOR DEGRADED PERFORMANCE OF EMERGENCY DIESEL GENERATORS. FAILURE OF AIR SUPPLY TO VENTILATION SYSTEM - DESIGN ERROR

**SCRAM** 11/22/88 LER# 24788018 50.72#: 14066 POWER: 100  
DESC: A MAIN TURBINE TRIP DUE TO A SPURIOUS TRIP SIGNAL FROM THE GENERATOR VOLTS/HERTZ TRIP CIRCUITRY RESULTED IN A TURBINE TRIP AND SUBSEQUENT REACTOR TRIP.

**SCRAM** 11/26/88 LER# 24788019 50.72#: 14085 POWER: 100  
DESC: A FUSE ON THE MAIN FEEDWATER ISOLATION VALVE FAILED CAUSING THE VALVE TO SHUT AND A REACTOR TRIP ON LOW SG LEVEL.

**PI EVENTS FOR 89-1**

**SCRAM** 02/28/89 LER# 24789002 50.72#: 14885 POWER: 100  
DESC: AIR LINE TO HEATER DRAIN PUMPS BROKE CAUSING TURBINE RUNBACK AND REACTOR SCRAM ON OVERPOWER DELTA-T.

**SSF** 03/24/89 LER# 24789006 50.72#: 15114 POWER: 0  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: DESIGN REVIEW OF EMERGENCY DIESEL LOADING INDICATED THAT UNDER CERTAIN CONDITIONS THE EMERGENCY DIESEL GENERATORS MAY BE LOADED BEYOND THEIR TWO HOUR EMERGENCY RATING.

**PI EVENTS FOR 89-2**

**SE** 04/08/89 LER# 50.72#: 15253 POWER: 0  
DESC: STEAM DAMAGE TO REDUNDANT TRAINS OF SERVICE WATER SYSTEM CABLES.

**SE** 05/07/89 LER# 50.72#: POWER: 0  
DESC: SINGLE FAILURE OF A SELECTOR SWITCH FOR A VOLTMETER COULD RESULT IN LOSS OF ALL AC BUSES. OEAB NOTIFIED BY PROJECT MANAGER FROM A TELCON PM HAD W/TH RI.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.51	.00	.92	.55	.00
SCRAMS < 15% POWER	0	0	1	0	0	0	0	0
TOTAL SCRAMS	0	0	1	1	0	2	1	0
SAFETY SYSTEM ACTUATIONS	0	2	1	0	0	0	0	0
SIGNIFICANT EVENTS	0	0	2	1	0	0	0	2
SAFETY SYSTEM FAILURES	0	0	0	1	0	1	1	0
FORCED OUTAGE RATE (%)	0	0	2	2	7	4	1	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.60	.51	.00	.92	.55	.00
CRITICAL HOURS	2208	96	1673	1963	1692	2164	1811	0
COLLECTIVE RADIATION EXPOSURE	40	1118	76	44	82	32	220	NA
CAUSE CODES:								
ADMINISTRATIVE	0	4	0	2	3	0	0	NA
LICENSED OPERATOR	0	0	1	0	0	0	0	NA
OTHER PERSONNEL	0	3	0	3	1	3	3	NA
MAINTENANCE	0	9	1	4	6	3	2	NA
A) MAINT PERSONNEL	0	2	0	2	1	3	2	NA
B) SURV AND TEST	0	4	0	2	2	0	0	NA
C) EQUIPMENT	0	2	1	1	1	0	0	NA
D) POTENTIAL MAINT	0	3	1	0	3	0	0	NA
DESIGN/INSTALLATION/FABRICATION	0	3	1	2	1	4	3	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

**TABLE 8.44**  
**INDIAN POINT 3**

**PI EVENTS FOR 88-3**

NONE

**PI EVENTS FOR 88-4**

**SSA** 10/09/88 LER# 28688006 50.72#: 13656 POWER: 100  
DESC: BKR 52/5A OPENED DUE TO SENSED LOW VOLTAGE, CAUSED DIESEL TO START.

**SCRAM** 10/09/88 LER# 28688006 50.72#: 13656 POWER: 100  
DESC: THE TURBINE GOVERNOR ASSEMBLY SHIFTED DUE TO A SHEARED RETAINING PIN LEAD TO A LOSS OF AUTO STOP OIL RESULTING IN A TURBINE TRIP AND A REACTOR TRIP.

**PI EVENTS FOR 89-1**

**SSA** 02/04/89 LER# 28689001 50.72#: 14649 POWER: 0  
DESC: S1 IN PULL TO LOCK - DIESELS STARTED WHEN REFILLING SG SENSING LINES CAUSED UNEVEN REFILLING AND A FALSE HIGH STEAM FLOW SIGNAL S1.

**PI EVENTS FOR 89-2**

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.46	.46	.60	.00	.78	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	1	1	1	0	1	0	0
SAFETY SYSTEM ACTUATIONS	1	0	0	0	0	1	1	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	1	0	0	1	0	0	0	0
FORCED OUTAGE RATE (%)	0	2	1	7	0	43	0	8
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.93	.60	.00	1.57	.00	4.65
CRITICAL HOURS	674	2181	2158	1670	2208	1277	817	215
COLLECTIVE RADIATION EXPOSURE	127	18	7	39	4	45	454	NA
CAUSE CODES:								
ADMINISTRATIVE	0	1	1	1	0	0	4	NA
LICENSED OPERATOR	1	0	1	0	0	0	0	NA
OTHER PERSONNEL	1	1	1	0	1	1	4	NA
MAINTENANCE	2	2	2	2	1	1	6	NA
A) MAINT PERSONNEL	1	1	2	0	1	1	2	NA
B) SURV AND TEST	1	0	0	1	0	0	3	NA
C) EQUIPMENT	1	0	0	1	0	0	1	NA
D) POTENTIAL MAINT	0	1	0	1	0	0	0	NA
DESIGN/INSTALLATION/FABRICATION	0	2	0	1	0	2	0	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA



TABLE 8.45

KEWAUNEE

PI EVENTS FOR 88-3

NONE

PI EVENTS FOR 88-4

NONE

PI EVENTS FOR 89-1

SSF 03/10/89 LER# 30589005 50.72#; 14991 POWER: 0

SYSTEM: DIESEL GENERATOR STARTING AIR SYSTEM

DESC: LICENSEE MANAGEMENT REVIEW DISCOVERED DESIGN DEFICIENCIES OF THE DIESEL AIR START SYSTEM. SEVERAL RATINGS WERE LOWER THAN SYSTEM OPERATING CONDITIONS AND MODIFICATION SEISMIC DOC. COULD NOT BE FOUND. BOTH DIESEL GENERATORS WERE DECLARED INOPERABLE.

PI EVENTS FOR 89-2

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.45	.00	.68	1.04	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	1	0	1	2	0	0	0	0
SAFETY SYSTEM ACTUATIONS	0	0	2	0	0	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	0	0	0	1	0	0	1	0
FORCED OUTAGE RATE (%)	0	0	0	3	4	0	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.45	.00	.68	1.04	.00	.00	.00	.00
CRITICAL HOURS	2202	2209	1478	1932	2137	2209	1208	1825
COLLECTIVE RADIATION EXPOSURE	3	5	175	26	5	5	208	NA
CAUSE CODES:								
ADMINISTRATIVE	1	1	1	2	2	0	4	NA
LICENSED OPERATOR	0	0	1	0	2	0	0	NA
OTHER PERSONNEL	1	0	0	1	2	0	1	NA
MAINTENANCE	2	0	2	3	3	0	5	NA
A) MAINT PERSONNEL	1	0	0	1	0	0	1	NA
B) SURV AND TEST	1	0	1	1	2	0	4	NA
C) EQUIPMENT	1	0	1	1	0	0	0	NA
D) POTENTIAL MAINT	1	0	1	1	1	0	0	NA
DESIGN/INSTALLATION/FABRICATION	0	2	0	2	0	0	2	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

TABLE 8.46

LASALLE 1

PI EVENTS FOR 88-3

**SSF** 07/12/88 LER# 37388015 50.72#: 12797 POWER: 40  
 SYSTEM: REACTOR CORE ISOLATION COOLING SYSTEM  
 DESC: RCIC WAS DECLARED INOPERABLE WHEN THE TURBINE TRIP THROTTLE VALVE WOULD NOT OPEN AFTER A TEST. BADLY WORN WASHER ON THE LINKAGE BETWEEN THE TURBINE AND THE TRIP THROTTLE.

**SSF** 08/22/88 LER# 37388018 50.72#: 13262 POWER: 98  
 SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
 DESC: "O" DIESEL WATER COOLING PUMP FAILED TO START DUE TO BREAKER FAILURE. SEVERAL SYSTEMS LOST RESPECTIVE TRAIN "O", BUT RCIC AND LPCS COULD EVENTUALLY BE LOST. BOTH UNITS AFFECTED.

PI EVENTS FOR 88-4

NONE

PI EVENTS FOR 89-1

**SE** 03/02/89 LER# 37389009 50.72#: 14910 POWER: 86  
 DESC: FAULT ON UNIT 2 SAT RESULTED IN UNIT 1 REACTOR TRIP WITH SUBSEQUENT EQUIPMENT MALFUNCTIONS, INSTRUMENT AIR, PROCESS COMPUTER, CREVAS, ALTERNATE RPS BREAKERS, AND A RECIRC FCV. AIT TO SITE.

**SCRAM** 03/02/89 LER# 37389009 50.72#: 14910 POWER: 86  
 DESC: STATION AUXILIARY TRANSFORMER TRIPPED DUE TO DIFFERENTIAL OVERCURRENT CAUSED BY A FAILED LIGHTNING ARRESTOR. THE MAIN GENERATOR LOCKED OUT CAUSING A TURBINE TRIP AND A REACTOR TRIP.

**SSF** 03/04/89 LER# 37389011 50.72#: 14933 POWER: 0  
 SYSTEM: HIGH PRESSURE CORE SPRAY SYSTEM  
 DESC: HPCS WAS DECLARED INOPERABLE WHEN A CROSS TIE OF UNIT 1 DIV III BATTERY CHARGER TO THE UNIT 2 DIVISION III BATTERY BUS WAS PERFORMED (UNIT 2 LOSS OF DIV III AC, RE 14932). THIS REQUIRED THE UNIT 1 HPCS BE DECLARED INOPERABLE.

PI EVENTS FOR 89-2

**SSF** 06/09/89 LER# 37389021 50.72#: 15833 POWER: 100  
 SYSTEM: REACTOR CORE ISOLATION COOLING SYSTEM  
 DESC: THE RCIC SYSTEM WAS DECLARED INOPERABLE WHEN DURING A TECH. SPEC. SURVEILLANCE TEST A RCIC TURBINE STEAM SUPPLY LINE ISOLATION VALVE FAILED. VALVE MECHANICAL FAILURE CAUSED BY DUE TO BUILD UP OF CORROSION PRODUCTS BETWEEN STEM AND STEM NUT.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.47	.00	.00	.00	.00	.48	.00
SCRAMS < 15% POWER	1	0	0	0	0	0	0	0
TOTAL SCRAMS	1	1	0	0	0	0	1	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	1	0
SAFETY SYSTEM FAILURES	1	2	0	0	2	0	1	1
FORCED OUTAGE RATE (%)	17	4	0	0	7	0	4	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	3.03	.47	.00	.00	.00	.00	.48	.00
CRITICAL HOURS	330	2135	1730	0	1992	2209	2086	2183
COLLECTIVE RADIATION EXPOSURE	151	58	173	413	90	560	178	NA
CAUSE CODES:								
ADMINISTRATIVE	3	1	1	0	1	1	3	NA
LICENSED OPERATOR	0	0	0	0	0	0	2	NA
OTHER PERSONNEL	0	0	0	3	0	2	2	NA
MAINTENANCE	4	6	4	7	5	5	13	NA
A) MAINT PERSONNEL	0	1	0	4	1	1	0	NA
B) SURV AND TEST	2	0	0	0	0	1	4	NA
C) EQUIPMENT	2	5	4	3	2	3	6	NA
D) POTENTIAL MAINT	2	5	3	3	4	2	4	NA
DESIGN/INSTALLATION/FABRICATION	4	2	0	3	2	2	4	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

TABLE 8.47

LASALLE 2

PI EVENTS FOR 88-3

**SSF** 08/22/88 LER# 37388018 50.72#: 13262 POWER: 70  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: "0" DIESEL WATER COOLING PUMP FAILED TO START DUE TO BREAKER FAILURE. SEVERAL SYSTEMS LOST RESPECTIVE TRAIN "A", BUT RC/C AND LPCS COULD EVENTUALLY BE LOST. BOTH UNITS AFFECTED.

**SSF** 08/31/88 LER# 37488010 50.72#: 13334 POWER: 74  
SYSTEM: AUTOMATIC DEPRESSURIZATION SYSTEM  
DESC: BACKUP PRESSURE REGULATOR FOR ADS FAILED TO MAINTAIN ADEQUATE SYSTEM PRESSURE, 3 ADS ACCUMULATOR LOW PRESSURE ALARMS. ONE PRIMARY COMPRESSOR OUT FOR MAINTENANCE, OTHER TRAIN ERRATIC, BACKUP FAILED.

PI EVENTS FOR 88-4

NONE

PI EVENTS FOR 89-1

**SSA** 01/25/89 LER# 37489002 50.72#: 14569 POWER: 0  
DESC: '2B' DIESEL STARTED ON ECCS DIV 3 LOW LEVEL AND HPCS START SIGNAL, BUT PUMP IN PULL TO LOCK DUE TO OPENING WRONG INSTRUMENT DRAIN VALVE AND CAUSING LOW RX LEVEL CONDITION.

**SSA** 03/02/89 LER# 37389009 50.72#: 14910 POWER: 89  
DESC: STATION AUXILIARY TRANSFORMER TRIPPED DUE TO DIFFERENTIAL OVERCURRENT CAUSED BY A FAILED LIGHTNING ARRESTOR. "2B" DIESEL GENERATOR AUTO-STARTED ON UNDERVOLTAGE AND LOADED.

**SE** 03/02/89 LER# 50.72#: 14910 POWER: 89  
DESC: FAULT ON UNIT 2 SAT RESULTED IN UNIT 1 REACTOR TRIP WITH SUBSEQUENT EQUIPMENT MALFUNCTIONS, INSTRUMENT AIR, PROCESS COMPUTER, CREVAS, ALTERNATE RPS BREAKERS, AND A RECIRC FCV. AIT TO SITE.

**SSF** 03/04/89 LER# 37389011 50.72#: 14932 POWER: 87  
SYSTEM: HIGH PRESSURE CORE SPRAY SYSTEM  
DESC: HPCS WAS DECLARED INOPERABLE WHEN '1E' DIV. III DIESEL DEVELOPED A FUEL LEAK (SPRAYED FUEL OIL IN DIESEL AND HPCS ROOM). LOSS OF DIV III AC POWER LEAVES HPCS WITH NO EMERGENCY POWER SOURCE.

PI EVENTS FOR 89-2

**SSA** 06/12/89 LER# 37489007 50.72#: 15843 POWER: 99  
DESC: AUXILIARY TRANSFORMER POWER LOST - DIESELS OOS FOR MAINTENANCE - DIESEL STARTED MANUALLY TO RESTORE POWER TO THE BUS.

**SSF** 06/14/89 LER# 37489008 50.72#: POWER: 96  
SYSTEM: HIGH PRESSURE CORE SPRAY SYSTEM  
DESC: THE DIV III HPCS DIESEL POWERED GENERATOR WINDINGS WERE DAMAGED WHEN INADVERTENTLY PARALLELED WITH SAT OFFSITE POWER SOURCE FEEDER BREAKER. THE FEEDER BREAKER HAD BENT SEC. STABS WHICH CAUSED THE BREAKER TO AUTO-CLOSE IN AN OUT OF PHASE CONDITION.

TABLE 8.47 (CONT.)

LASALLE 2 (CONT.)

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.50	.00	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	1	0	0	0	0	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	2	1
SIGNIFICANT EVENTS	0	0	1	0	0	0	1	0
SAFETY SYSTEM FAILURES	0	4	0	2	2	0	1	1
FORCED OUTAGE RATE (%)	0	0	10	0	3	4	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.50	.00	.46	.00	.00	.00
CRITICAL HOURS	2208	2209	1983	2183	2159	323	1246	2183
COLLECTIVE RADIATION EXPOSURE	151	58	173	413	90	560	178	NA
CAUSE CODES:								
ADMINISTRATIVE	1	2	2	0	1	2	5	NA
LICENSED OPERATOR	0	0	0	0	1	1	2	NA
OTHER PERSONNEL	0	1	1	4	0	0	4	NA
MAINTENANCE	7	5	4	9	6	7	12	NA
A) MAINT PERSONNEL	0	2	0	4	1	0	0	NA
B) SURV AND TEST	0	0	2	1	0	3	6	NA
C) EQUIPMENT	2	3	2	3	3	4	4	NA
D) POTENTIAL MAINT	3	3	2	3	5	4	3	NA
DESIGN/INSTALLATION/FABRICATION	2	2	0	2	1	2	4	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

**TABLE 8.48**

**LIMERICK 1**

**FI EVENTS FOR 88-3**

**NONE**

**PI EVENTS FOR 88-4**

**SE** 10/03/88 LER# 35288030 50.72#: 13611 POWER: 0  
DESC: THREE FIRE DAMPER ACCESS DOORS WERE NOT STRUCTURALLY QUALIFIED TO WITHSTAND THE STEAM PRESSURE FROM A HIGH ENERGY LINE BREAK, THUS, STEAM COULD PENETRATE AREAS WITH SAFETY-RELATED EQUIPMENT RENDERING THEM INOPERABLE.

**SE** 10/06/88 LER# 35288031 50.72#: 13637 POWER: 0  
DESC: REACTOR PRESSURE & REACTOR LEVEL INSTRUMENTATION AS WELL AS THE RCIC FLOW CONTROL INSTRUMENTS ON REMOTE SHUTDOWN PANEL COULD BE UNAVAILABLE DURING A FIRE EVENT IN MAIN CONTROL ROOM. THESE INSTRUMENTS ARE NECESSARY TO CONDUCT A REMOTE SAFE SHUTDOWN.

**SSF** 11/01/88 LER# 35288033 50.72#: POWER: 57  
SYSTEM: DC POWER SYSTEM - CLASS 1E  
DESC: INOPERABILITY OF UNIT 1 CLASS 1E DIVISION 1 AND 11 DC POWER SOURCE DUE TO UNACCEPTABLE ELECTRICAL ISOLATION WITH UNIT 2 NON-CLASS 1E CIRCUITS. DEC 1987 THRU NOV 1988.

**PI EVENTS FOR 89-1**

**SSF** 01/04/89 LER# 35289002 50.72#: 14410 POWER: 41  
SYSTEM: REACTOR CORE ISOLATION COOLING SYSTEM  
DESC: DUE TO INSUFFICIENT CABLE FIRE PROTECTION, A FIRE IN CERTAIN AREAS OF THE PLANT COULD CAUSE THE HPCI TO INITIATE AND NOT BE SHUTDOWN. THE REACTOR VESSEL WOULD OVERFILL AND WATER CARRYOVER INTO THE RCIC TURBINE. THIS WOULD RENDER THE RCIC INOPERABLE.

**SSF** 01/04/89 LER# 35289002 50.72#: 14410 POWER: 41  
SYSTEM: REACTOR CORE ISOLATION COOLING SYSTEM  
DESC: DUE TO INSUFFICIENT CABLE FIRE PROTECTION, A FIRE IN CERTAIN AREAS OF THE PLANT COULD CAUSE THE RCIC INBOARD STEAM SUPPLY ISOLATION VALVE TO CLOSE AND NOT BE REOPENED DUE TO DAMAGED CONTROL AND POWER CABLES. THIS WOULD RENDER THE RCIC INOPERABLE.

**SSF** 01/10/89 LER# 35289004 50.72#: 14459 POWER: 41  
SYSTEM: LOW-VOLTAGE POWER SYSTEM - CLASS 1E  
DESC: REVIEW OF 4KV SAFEGUARD BUSES' UV SETPOINTS REVEALED THAT SETPOINTS ARE NOT HIGH ENOUGH TO ENSURE THE 480 V LOAD CENTER VOLTAGE WOULD BE ABLE TO TRANSFER DURING DEGRADED VOLTAGE CONDITIONS.

**SSF** 01/26/89 LER# 35289008 50.72#: POWER: 0  
SYSTEM: LOW-VOLTAGE POWER SYSTEM - CLASS 1E  
DESC: THE REQUIRED SEPARATION BETWEEN CLASS 1E AND NON-CLASS 1E CIRCUITS IN PANELS CONTAINING GCIS, SGTS, RERS AND NSSSS SYSTEM CABLING WAS NOT MET, WHICH RENDERED THE SYSTEMS INOPERABLE.

**SE** 02/10/89 LER# 50.72#: POWER: 0  
DESC: EXCESSIVE CORROSION OF FUEL CLADDING DUE TO CILC. (MORNING REPORT: 02/10/89)

**SSF** 02/15/89 LER# 35289012 50.72#: 14762 POWER: 0  
SYSTEM: REACTOR CORE ISOLATION COOLING SYSTEM  
DESC: THE CONTROL CABLES TO THE MAINTENANCE FW ISOLATION VALVE HAVE INSUFFICIENT FIRE PROTECTION. IN THE EVENT OF A FIRE IN THE CONTROL CABLES, A SHORT CIRCUIT CONDITION COULD CLOSE THE MAINTENANCE FW ISOLATION VALVE AND ISOLATE THE RCIC SYSTEM.

**SSF** 02/16/89 LER# 35289014 50.72#: 14775 POWER: 0  
SYSTEM: EMERGENCY/STANDBY GAS TREATMENT SYSTEM  
DESC: BOTH TRAINS OF THE STANDBY GAS TREATMENT SYSTEM WERE DECLARED INOPERABLE. "B" TRAIN TRIPPED ON LOW AIR FLOW, "A" TRAIN BECAUSE OF FAULTY FILTER TRAIN HEATER DIFFERENTIAL TEMPERATURE TRANSMITTER.

TABLE 8.48 (CONT.)

LIMERICK 1 (CONT.)

PI EVENTS FOR 89-1 (CONT.)

**SSF** 03/02/89 LER# 35289017 50.72#: 14906 POWER: 0  
 SYSTEM: CONTAINMENT COMBUSTIBLE GAS CONTROL SYSTEM  
 DESC: INSPECTION DETERMINED THAT DUE TO LACK OF SEALS, LOW FLOW SWITCHES FOR THE DRYWELL HYDROGEN GAS MIXERS MAY BE SUBJECT TO MOISTURE INTRUSION DURING A LOCA. POTENTIAL TO TRIP FANS RESULTING IN HIGH HYDROGEN CONCENTRATIONS.

**SSF** 03/30/89 LER# 35289022 50.72#: POWER: 0  
 SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
 DESC: THE CONTROL ROOM EMERGENCY FRESH AIR SUPPLY SYSTEM TRAINS WERE DECLARED INOPERABLE DUE TO INADEQUATE PHYSICAL SEPARATION BETWEEN CLASS 1E DIVISION CABLES. THIS CONDITION WAS IDENTIFIED BY A NRC INSPECTOR.

PI EVENTS FOR 89-2

**SSF** 04/05/89 LER# 35289023 50.72#: 15214 POWER: 0  
 SYSTEM: POST-ACCIDENT MONITORING SYSTEM  
 DESC: IN THE EVENT OF A FIRE, SUPPRESSION POOL LEVEL AND TEMPERATURE INDICATION MAY BE LOST DUE TO NON-SAFETY RELATED CABLING IN THESE SYSTEMS. THIS COULD IMPACT SAFE SHUTDOWN OPERATIONS: LOSS OF RHR.

**SSF** 05/12/89 LER# 35289034 50.72#: 15702 POWER: 0  
 SYSTEM: POST-ACCIDENT MONITORING SYSTEM  
 DESC: SEALS IN 19 PRESSURE BOUNDARY EXCESS FLOW CHECK VALVES WOULD BREAK DOWN DURING POST LOCA CONDITIONS. POTENTIAL FOR INACCURATE REACTOR LEVEL AND PRESSURE, MSIV LEAKAGE CONTROL, AND REACTOR RECIRC. PUMP FLOW. CAUSED BY INADEQUATE DESIGN REVISION.

**SSF** 05/25/89 LER# 35289036 50.72#: POWER: 0  
 SYSTEM: AUTOMATIC DEPRESSURIZATION SYSTEM  
 DESC: PRESSURE TESTING OF THE MAIN STEAM RELIEFS REVEALED THAT ONLY ONE OF 17 DRVS LIFTED WITHIN THE TECH. SPEC. REQUIRED LIMITS. CAUSED BY CORROSION INDUCED BONDING BETWEEN THE PILOT DISC AND SEAT AND HAS BEEN A REPETITIVE PROBLEM.

**SSF** 06/01/89 LER# 35289039 50.72#: POWER: 79  
 SYSTEM: REACTOR CORE ISOLATION COOLING SYSTEM  
 DESC: THE RCIC SYSTEM MAY BECOME INOPERABLE IN THE EVENT OF A FIRE INVOLVING THE RCIC BAROMETRIC CONDENSER AND RCIC COMPARTMENT UNIT COOLER DUE TO MOISTURE RELATED PROBLEMS WITH RCIC CIRCUITRY. THIS WAS FOUND AS A RESULT OF A SAFE SHUTDOWN CAPABILITY STUDY

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	2.56	.00	.00	.00	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	1	0	0	0	0
TOTAL SCRAMS	2	0	0	1	0	0	0	0
SAFETY SYSTEM ACTUATIONS	2	0	0	0	0	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	2	1	0
SAFETY SYSTEM FAILURES	1	2	2	1	0	1	8	4
FORCED OUTAGE RATE (%)	18	0	0	14	0	0	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	2.56	.00	.00	.00	.00	.00	.00	.00
CRITICAL HOURS	78	2209	2184	1875	2208	2209	258	1110
COLLECTIVE RADIATION EXPOSURE	117	22	17	16	12	9	162	NA
CAUSE CODES:								
ADMINISTRATIVE	7	8	3	3	0	4	9	NA
LICENSED OPERATOR	2	2	1	1	0	1	0	NA
OTHER PERSONNEL	8	6	2	3	1	5	5	NA
MAINTENANCE	16	14	5	9	0	6	8	NA
A) MAINT PERSONNEL	5	3	2	3	0	3	3	NA
S) SURV AND TEST	9	2	2	3	0	2	4	NA
C) EQUIPMENT	3	7	0	3	0	0	0	NA
D) POTENTIAL MAINT	2	6	1	2	0	1	1	NA
DESIGN/INSTALLATION/FABRICATION	5	2	7	5	3	8	10	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

TABLE 8.49

LIMERICK 2

PI EVENTS FOR 88-3

NONE

PI EVENTS FOR 88-4

NONE

PI EVENTS FOR 89-1

NONE

PI EVENTS FOR 89-2

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	NA	NA	NA	NA	NA	NA	NA	NA
SCRAMS < 15% POWER	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SCRAMS	NA	NA	NA	NA	NA	NA	NA	NA
SAFETY SYSTEM ACTUATIONS	NA	NA	NA	NA	NA	NA	NA	0
SIGNIFICANT EVENTS	NA	NA	NA	NA	NA	NA	NA	0
SAFETY SYSTEM FAILURES	NA	NA	NA	NA	NA	NA	NA	0
FORCED OUTAGE RATE (%)	NA	NA	NA	NA	NA	NA	NA	NA
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	NA	NA	NA	NA	NA	NA	NA	NA
CRITICAL HOURS	NA	NA	NA	NA	NA	NA	NA	NA
COLLECTIVE RADIATION EXPOSURE	NA	NA	NA	NA	NA	NA	NA	NA
CAUSE CODES:								
ADMINISTRATIVE	NA	NA	NA	NA	NA	NA	NA	NA
LICENSED OPERATOR	NA	NA	NA	NA	NA	NA	NA	NA
OTHER PERSONNEL	NA	NA	NA	NA	NA	NA	NA	NA
MAINTENANCE	NA	NA	NA	NA	NA	NA	NA	NA
A) MAINT PERSONNEL	NA	NA	NA	NA	NA	NA	NA	NA
B) SURV AND TEST	NA	NA	NA	NA	NA	NA	NA	NA
C) EQUIPMENT	NA	NA	NA	NA	NA	NA	NA	NA
D) POTENTIAL MAINT	NA	NA	NA	NA	NA	NA	NA	NA
DESIGN/INSTALLATION/FABRICATION	NA	NA	NA	NA	NA	NA	NA	NA
EQUIPMENT FAILURE	NA	NA	NA	NA	NA	NA	NA	NA

**TABLE 8.50  
MAINE YANKEE**

**PI EVENTS FOR 88-3**

**SSA** 08/13/88 LER# 30988006 50.72#: 13187 POWER: 98  
DESC: ELECTRICAL RESERVE BREAKERS DID NOT CLOSE FOLLOWING RX TRIP CAUSING LOSS OF POWER TO VITAL BUSES AND RCP'S - DIESELS STARTED AND SUPPLIED BUS.

**SE** 08/13/88 LER# 30988006 50.72#: 13187 POWER: 98  
DESC: SCRAM COMPLICATED BY RESERVE BREAKERS FAILING TO CLOSE.

**SCRAM** 08/13/88 LER# 30988006 50.72#: 13187 POWER: 98  
DESC: AN ELECTRICAL FAULT IN MAIN TRANSFORMER, X1A, CAUSED A TURBINE TRIP AND A SUBSEQUENT REACTOR TRIP.

**PI EVENTS FOR 88-4**

**GSF** 11/08/88 LER# 30988009 50.72#: POWER: 0  
SYSTEM: NCORE/EXCORE NEUTRON MONITORING SYSTEM  
DESC: 2 NEUTRON FLUX MONITOR CABLE ASSEMBLIES FAILED MANUFACTURER'S PRESSURE TEST AND DEVELOPED LEAKS IN THE CABLE ASSEMBLY. POTENTIAL CONSEQUENCE OF FAILURE WAS LOSS OF NR FLUX INDICATION DURING ACCIDENT.

**SCRAM** 12/16/88 LER# 30988010 50.72#: 14265 POWER: 18  
DESC: HEATER DRAIN TANK DRAIN VALVE WAS NOT ALIGNED TO DRAIN THE TANK DUE TO AN IMPROPER VALVE LINEUP THIS CAUSED A TURBINE TRIP ON HIGH LEVEL IN THE HEATER DRAIN TANK WHICH CAUSED A REACTOR TRIP.

**SSA** 12/22/88 LER# 30988011 50.72#: 14312 POWER: 0  
DESC: OPERATOR ALLOWED RCS PRESSURE TO DROP BELOW SIAS SETPOINT CAUSING SIAS.

**SCA** 12/22/88 LER# 30988011 50.72#: 14312 POWER: 0  
DESC: OPERATOR ALLOWED RCS PRESSURE TO DROP BELOW SIAS SETPOINT AFTER RESETTING SIAS FROM FIRST EVENT CAUSING ANOTHER SIAS.

**PI EVENTS FOR 89-1**

**SCRAM** 01/10/89 LER# 30989001 50.72#: 14461 POWER: 100  
DESC: POWER LOST TO EHC FOR UNKNOWN REASON CAUSING TURBINE TRIP SCRAM.

**PI EVENTS FOR 89-2**

**SCRAM** 04/05/89 LER# 30989003 50.72#: 15217 POWER: 100  
DESC: MAIN TURBINE GENERATOR TRIPPED FOLLOWING A LOAD REJECTION PROTECTION EVENT. THE TURBINE TRIP CAUSED THE REACTOR TO TRIP.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.90	.00	.46	.00	.48	1.97	.51	.46
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	1	0	1	0	1	1	1	1
SAFETY SYSTEM ACTUATIONS	0	0	0	0	1	2	0	0
SIGNIFICANT EVENTS	0	0	0	0	1	0	0	0
SAFETY SYSTEM FAILURES	0	0	0	1	0	1	0	0
FORCED OUTAGE RATE (%)	58	0	1	0	9	34	11	1
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.46	.00	.96	3.94	1.02	.00
CRITICAL HOURS	1115	2209	2168	2183	2091	508	1970	2172
COLLECTIVE RADIATION EXPOSURE	40	16	20	23	18	665	21	NA
CAUSE CODES:								
ADMINISTRATIVE	0	0	2	0	1	0	1	NA
LICENSED OPERATOR	0	0	0	0	0	1	0	NA
OTHER PERSONNEL	0	0	0	0	1	1	0	NA
MAINTENANCE	1	0	2	0	2	1	1	NA
A) MAINT PERSONNEL	0	0	1	0	0	1	0	NA
B) SURV AND TEST	0	0	0	0	1	0	0	NA
C) EQUIPMENT	0	0	1	0	1	0	0	NA
D) POTENTIAL MAINT	1	0	1	0	1	0	1	NA
DESIGN/INSTALLATION/FABRICATION	0	0	0	2	1	1	1	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA



**TABLE 8.51****MCGUIRE 1****PI EVENTS FOR 88-3**

- SSF** 08/12/88 LER# 36988020 50.72#: POWER: 100  
 SYSTEM: HIGH PRESSURE SAFETY INJECTION SYSTEM  
 DESC: BOTH TRAINS OF THE SAFETY INJECTION SYSTEM WERE INOPERABLE, ONE TRAIN OUT FOR NON-ROUTINE MAINT, TESTING WAS PERFORMED ON REDUNDANT TRAIN AND A VALVE ACTUATOR SEPARATED FROM VALVE. POOR PLANNING.
- SSF** 09/02/88 LER# 36988026 50.72#: POWER: 100  
 SYSTEM: CONTAINMENT SPRAY SYSTEM  
 DESC: CONTAINMENT SPRAY SYSTEM INTERLOCK RENDERED INOPERABLE BECAUSE OF AN IMPROPERLY WIRED LIMIT SWITCH. PUMP SUCTION FROM CONTAINMENT SUMP INOPERABLE, CAUSED BY PERSONNEL ERROR.
- SSF** 09/12/88 LER# 36988024 50.72#: POWER: 100  
 SYSTEM: CLOSED/COMPONENT COOLING WATER SYSTEM  
 DESC: WITH TRAIN "A" OF THE COMPONENT COOLING WATER SYSTEM OUT OF SERVICE FOR MAINTENANCE, TRAIN "B" WAS DECLARED INOPERABLE WHEN HEAT EXCHANGER FAILED PERFORMANCE TEST. FOULING. UNIT ENTERED TS 3.0.3

**PI EVENTS FOR 88-4**

- SSF** 10/12/88 LER# 36988032 50.72#: 13684 POWER: 0  
 SYSTEM: REACTOR BUILDING ENVIRONMENTAL CONTROL SYSTEM  
 DESC: BOTH TRAINS OF THE CONTAINMENT ANNULUS VENTILATION SYSTEM DECLARED INOPERABLE. SYSTEM FAILED PERIODIC TEST INVOLVING THE SYSTEM'S CAPABILITY TO MAINTAIN REQUIRED PRESSURE. CAUSED BY LEAKING DOOR SEALS
- SSF** 10/24/88 LER# 36988034 50.72#: 13811 POWER: 0  
 SYSTEM: REACTOR BUILDING ENVIRONMENTAL CONTROL SYSTEM  
 DESC: WITH MCGUIRE 1 TRAIN "B" OF THE CONTROL ROOM EMERGENCY VENTILATION OUT OF SERVICE, FLUSH OF "A" TRAIN COOLING PERFORMED AT MCGUIRE 2. REDUCED FLOWS FOR UNIT 1, BOTH TRAINS INOPERABLE.
- SSF** 10/25/88 LER# 36988040 50.72#: POWER: 0  
 SYSTEM: REACTOR CONTAINMENT BUILDING  
 DESC: CONTAINMENT INTEGRITY BREACHED WHEN 3 TEMPORARY PENETRATIONS WERE FOUND LEAKING. FEUL MOVEMENT HAD TAKEN PLACE. CAUSED BY MANAGEMENT DEFICIENCY BECAUSE OF INSUFFICIENT SUPERVISION.
- SE** 11/18/88 LER# 36988036 50.72#: 14035 POWER: 0  
 DESC: CROSS CONNECTS FROM DIESEL STARTING AIR TO INSTRUMENT AIR TANKS PROVIDE BACKUP AIR. HOWEVER, THIS COULD RESULT IN AN INADEQUATE SUPPLY OF STARTING AIR DURING A BLACKOUT. MCGUIRE 2 LICENSED 1983. MCGUIRE 2 AT TIME OF EVENT, AT 100% POWER.
- SSF** 11/18/88 LER# 36988036 50.72#: 14035 POWER: 0  
 SYSTEM: DIESEL GENERATOR STARTING AIR SYSTEM  
 DESC: POTENTIAL FAILURE MODE FOR EDGS DISCOVERED. REG VALVES THAT CONNECT THE STARTING AIR COMPRESSORS TO THE INSTRUMENT AIR SYSTEM PASS TOO MUCH AIR, LEAVING AN INSUFFICIENT SUPPLY TO START THE EDGS.
- SSA** 11/29/88 LER# 36988058 50.72#: 14107 POWER: 0  
 DESC: NORMAL SWITCH VERSUS TEST SWITCH CAUSED RACKED-OUT BREAKER TO CLOSE CAUSING LOSS OF POWER TO 1/2 OF UNIT DUE TO SUPERVISOR NOT PROVIDING ADEQUATE INSTRUCTIONS TO PERFORM TEST CAUSED DIESEL TO START AND LOAD BUS.
- SE** 12/11/88 LER# 36988044 50.72#: 14271 POWER:  
 DESC: TWO COLD LEG AND ONE HOT LEG "EVENT V" CHECK VALVES FAILED.

**PI EVENTS FOR 89-1**

- SSF** 01/17/89 LER# 36989001 50.72#: POWER: 100  
 SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
 DESC: BOTH TRAINS OF THE CONTROL ROOM EMERGENCY VENTILATION SYSTEM INOPERABLE APPROXIMATELY 5 HOURS. ERROR IN MAINT. SCHEDULING ALLOWED MAINT. TO BE PERFORMED ON BOTH TRAINS AT THE SAME TIME.

TABLE 8.51 (CONT.)

MCGUIRE 1 (CONT.)

PI EVENTS FOR 89-1 (CONT.)

**SSA** 03/07/89 LER# 36989004 50.72#: 14963 POWER: 100  
DESC: SG TUBE RUPTURED NECESSITATING STARTING CVCS IN HPI MODE TO RECOVER PZR LEVEL.

**SE** 03/07/89 LER# 36989004 50.72#: 14963 POWER: 0  
DESC: A STEAM GENERATOR TUBE RUPTURE OCCURRED IN THE "B" STEAM GENERATOR WITH A MAXIMUM LEAK RATE OF ABOUT 500 PGM. AIT ON SITE. BRIEFING 89-10 & 89-11 (VERBAL, NO SLIDES).

**SSF** 03/10/89 LER# 36989007 50.72#: 15237 POWER: 100  
SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
DESC: BOTH TRAINS OF THE CONTROL ROOM EMERGENCY VENTILATION COOLING WATER SYSTEM WERE DECLARED INOPERABLE. CONTROL VALVE POSITIONERS WERE NOT SEISMICALLY QUALIFIED. NON SAFETY POSITIONERS COULD PREVENT SOLENOIDS FROM FAILING OPEN AS DESIGNED.

PI EVENTS FOR 89-2

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.86	.93	.47	.00	.00	.00	.00
SCRAMS < 15% POWER	1	0	0	0	0	0	0	0
TOTAL SCRAMS	1	1	2	1	0	0	0	0
SAFETY SYSTEM ACTUATIONS	3	0	1	0	0	1	1	0
SIGNIFICANT EVENTS	1	0	0	0	0	2	1	0
SAFETY SYSTEM FAILURES	2	4	0	0	3	4	2	0
FORCED OUTAGE RATE (%)	12	4	2	2	0	0	27	43
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	1.44	.86	.93	.93	.00	.00	.63	.80
CRITICAL HOURS	1390	1160	2146	2141	2208	289	1584	1256
COLLECTIVE RADIATION EXPOSURE	114	115	17	190	63	281	30	NA
CAUSE CODES:								
ADMINISTRATIVE	8	9	3	3	10	9	4	NA
LICENSED OPERATOR	3	1	1	1	0	3	0	NA
OTHER PERSONNEL	6	5	2	2	4	6	1	NA
MAINTENANCE	8	13	5	7	11	15	4	NA
A) MAINT PERSONNEL	4	6	3	2	3	8	1	NA
B) SURV AND TEST	5	4	1	2	5	4	3	NA
C) EQUIPMENT	1	3	1	3	4	5	1	NA
D) POTENTIAL MAINT	0	3	1	3	2	4	0	NA
DESIGN/INSTALLATION/FABRICATION	6	4	2	3	6	5	3	NA
EQUIPMENT FAILURE	0	1	0	1	0	0	1	NA

TABLE 8.52

MCGUIRE 2

PI EVENTS FOR 88-3

**SSF** 09/17/88 LER# 37088011 50.72#: POWER: 100  
 SYSTEM: CLOSED/COMPONENT COOLING WATER SYSTEM  
 DESC: BOTH TRAINS COMPONENT COOLING WATER INOPERABLE CAUSED BY EXCESSIVE BUILDUP (UNANTICIPATED) OF ENVIRONMENTAL DEBRIS (MUD, BACTERIA, AND ALGAE). DISCOVERED DURING OPERABILITY TEST. ENTERED TS 3.0.3

PI EVENTS FOR 88-4

**SE** 11/18/88 LER# 36988036 50.72#: 14035 POWER: 100  
 DESC: CROSS CONNECTS FROM DIESEL STARTING AIR TO INSTRUMENT AIR TANKS PROVIDE BACKUP AIR. HOWEVER, THIS COULD RESULT IN AN INADEQUATE SUPPLY OF STARTING AIR DURING A BLACKOUT. MCGUIRE 2 LICENSED 1983. MCGUIRE 2 AT TIME OF EVENT, AT 100% POWER.

**SSF** 11/18/88 LER# 36988036 50.72#: 14035 POWER: 100  
 SYSTEM: DIESEL GENERATOR STARTING AIR SYSTEM  
 DESC: POTENTIAL FAILURE MODE FOR EDGS DISCOVERED. REG VALVES THAT CONNECT THE STARTING AIR COMPRESSORS TO THE INSTRUMENT AIR SYSTEM PASS TOO MUCH AIR, LEAVING AN INSUFFICIENT SUPPLY TO START THE EDGS.

PI EVENTS FOR 89-1

**SCRAM** 03/03/89 LER# 37089001 50.72#: 14915 POWER: 100  
 DESC: TWO OUT OF FOUR LOGIC NEGATIVE POWER RANGE RATE TRIP SIGNALS WHEN PERFORMING ROD CONTROL CLUSTER ASSEMBLY MOVEMENT TEST AND SHUTDOWN BANK "E" WAS BEING DRAWN WHEN TRIP OCCURRED.

**SSF** 03/10/89 LER# 36989007 50.72#: 15237 POWER: 999  
 SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
 DESC: BOTH TRAINS OF THE CONTROL ROOM EMERGENCY VENTILATION COOLING WATER SYSTEM WERE DECLARED INOPERABLE. CONTROL VALVE POSITIONERS WERE NOT SEISMICALLY QUALIFIED. NON SAFETY POSITIONERS COULD PREVENT SOLENOIDS FROM FAILING OPEN AS DESIGNED.

**SCRAM** 03/14/89 LER# 37089002 50.72#: 15011 POWER: 70  
 DESC: GENERATOR LOAD REJECTION BYPASS VALVE FAILED TO OPEN CAUSING A LOW SG LEVEL REACTOR TRIP AND AUXILIARY FEEDWATER ACTUATION. A FAILED PRESSURE SWITCH AND A BROKEN AIR SUPPLY LINE CONTRIBUTED.

PI EVENTS FOR 89-2

**SCRAM** 04/06/89 LER# 37089003 50.72#: 15226 POWER: 100  
 DESC: LOW-LOW STEAM GENERATOR LEVEL CAUSED REACTOR TRIP WHEN A FRV CLOSED DUE TO A FAILED POSITIONER.

TYPE	87-3	P7-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.97	.92	.46	.00	.00	.00	.93	.46
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	2	2	1	0	0	0	2	1
SAFETY SYSTEM ACTUATIONS	0	0	0	1	0	0	0	0
SIGNIFICANT EVENTS	1	0	0	0	0	1	0	0
SAFETY SYSTEM FAILURES	1	3	0	1	1	1	1	0
FORCED OUTAGE RATE (%)	5	2	1	0	3	0	2	1
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.97	.92	.92	.00	2.52	.45	.93	.46
CRITICAL HOURS	2052	2170	2166	1349	1590	2209	2147	2165
COLLECTIVE RADIATION EXPOSURE	114	115	17	190	33	281	30	NA
CAUSE CODES:								
ADMINISTRATIVE	9	6	2	6	7	4	4	NA
LICENSED OPERATOR	1	1	1	1	0	0	0	NA
OTHER PERSONNEL	4	4	1	3	3	2	1	NA
MAINTENANCE	10	8	2	7	9	6	6	NA
A) MAINT PERSONNEL	3	4	2	6	3	2	1	NA
B) SURV AND TEST	6	4	0	1	4	2	3	NA
C) EQUIPMENT	3	1	1	1	4	3	2	NA
D) POTENTIAL MAINT.	2	0	0	1	1	0	2	NA
DESIGN/INSTALLATION/FABRICATION	6	4	1	3	4	2	1	NA
EQUIPMENT FAILURE	0	1	0	0	0	0	1	NA

TABLE 8.53  
MILLSTONE 1

PI EVENTS FOR 88-3

**SSF** 09/08/88 LER# 24588007 50.72#: 13405 POWER: 100  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: BOTH TRAINS OF THE EMERGENCY COOLING WATER STAINERS (SUPPLY LPCI HXS) INOPERABLE DUE TO UNRELATED EQUIPMENT FAILURES. RESULTED IN COMPONENT COOLING WATER AND CONTAINMENT COOLING SYSTEMS INOPERABILITY

PI EVENTS FOR 88-4

**SSF** 12/12/88 LER# 24588013 50.72#: POWER: 100  
SYSTEM: MEDIUM-VOLTAGE POWER SYSTEM - CLASS 1E  
DESC: SEISMIC QUALIFICATION OF ONE 4160 V BUS WAS OMITTED FROM REVIEW PROGRAM. CONDITION COULD HAVE RESULTED IN SHIFTING OF SWITCHGEAR, AFFECTING OTHER BUSES AND FAILURE OF EDG. POTENTIAL LOSS OF ALL AC.

PI EVENTS FOR 89-1

**SSF** 01/31/89 LER# 24589001 50.72#: 14605 POWER: 100  
SYSTEM: CONTAINMENT ISOLATION CONTROL SYSTEM  
DESC: ANALYSIS OF A SMALL BREAK LOCA RESULTED IN DETERMINATION THAT THE RWCU SYSTEM CONTAINMENT ISOLATION VALVES MAY NOT CLOSE FOLLOWING A BREAK IN THE DRYWELL. EQ OF ISOLATION VALVES IN QUESTION.

**SSF** 01/31/89 LER# 24589003 50.72#: POWER: 100  
SYSTEM: PRIMARY CONTAINMENT/UNDETERMINED SYSTEM  
DESC: AN ENGINEERING DESIGN REVIEW DETERMINED THAT THE REACTOR BUILDING CLOSED COOLING WATER SYSTEM DID NOT MEET TEMPERATURE DESIGN REQUIREMENTS OF A HIGH ENERGY LINE BREAK EVENT. THIS COULD RESULT IN A BREACH OF CONTAINMENT INTEGRITY DURING A MELB EVENT.

**SE** 03/22/89 LER# 24589003 50.72#: 15092 POWER: 0  
DESC: THE LICENSEE RECOGNIZED THAT A HIGH ENERGY LINE BREAK INSIDE CONTAINMENT COULD CAUSE DEGRADATION OF CONTAINMENT INTEGRITY. THE RBCCW SYSTEM WOULD NOT REMAIN A CLOSED SYSTEM.

PI EVENTS FOR 89-2

**SCRAM** 04/07/89 LER# 24589005 50.72#: 15246 POWER: 80  
DESC: TURBINE TRIPPED DUE TO A MOISTURE SEPARATOR DRAIN TANK HI-HI WATER LEVEL, DUE TO A FAILED LEVEL CONTROL VALVE, RESULTING IN A REACTOR TRIP.

**SSA** 04/29/89 LER# 24589012 50.72#: 15478 POWER: 0  
DESC: THE REMOVAL OF POWER TO THE RESERVE STATION SERVICE TRANSFORMER ALONG WITH THE EFFECT OF ONGOING MODIFICATIONS CAUSED THE EMERGENCY DIESEL GENERATOR TO START AND LOAD.

**SSF** 05/03/89 LER# 50.72#: 15521 POWER: 0  
SYSTEM: EMERGENCY/STANDBY GAS TREATMENT SYSTEM  
DESC: BOTH TRAINS OF SBTG SYSTEM INOPERABLE. THE A TRAIN WAS TAGGED OUT AND THE B TRAIN WAS CONSIDERED TECHNICALLY INOPERABLE DUE TO ITS FAILURE TO MEET THE REQUIRED FLOW RATE.

**SSF** 05/11/89 LER# 24589011 50.72#: 15595 POWER: 0  
SYSTEM: AUTOMATIC DEPRESSURIZATION SYSTEM  
DESC: FOUR OF SIX MAIN STEAM SAFETY RELIEF VALVES FAILED TO OPEN DURING TESTING AT THEIR T.S. REQUIRED SET PRESSURES. SETPOINT DRIFT POSTULATED AS BEING MILD OXIDIC BONDING BETWEEN THE PILOT DISC AND SEAT.

**SE** 05/29/89 LER# 24589014 50.72#: 15741 POWER: 0  
DESC: NEW INBOARD AND OUTBOARD SEALS FAILED ON A RECIRCULATION PUMP.

**SSF** 05/30/89 LER# 24589013 50.72#: POWER: 0  
SYSTEM: LOW PRESSURE CORE SPRAY SYSTEM  
DESC: DURING A HYDROSTATIC TEST, IT WAS NOTED THAT THE INSTALLED CORE SPRAY ORIFICE FLANGES WERE RATED AT 150 PSIG INSTEAD OF 300 PSIG REQUIRED BY DESIGN. BASED ON STRESS CALCULATIONS, THE 150 PSIG FLANGES ARE NOT ADEQUATE FOR THE C.S. DESIGN PARAMETERS.

**TABLE B.53 (CONT.)**  
**MILLSTONE 1 (CONT.)**

**PI EVENTS FOR 89-2 (CONT.)**

**SCRAM** 06/02/89 LER# 24589015 50.72#: 15771 POWER: 0  
DESC: LOW CONDENSER VACUUM WHILE CONDUCTING A STARTUP CAUSED A REACTOR SCRAM DUE TO THE OPERATOR'S INATTENTION TO DETAIL.

**SSF** 06/16/89 LER# 50.72#: 15884 POWER: 100  
SYSTEM: REACTOR CORE ISOLATION COOLING SYSTEM  
DESC: THE ISOLATION CONDENSERS MAY NOT HAVE BEEN ABLE TO PERFORM THEIR DESIGN SAFETY FUNCTION DUE TO DIFFERENTIAL PRESSURE SWITCHES WHICH WERE FOUND OUT OF CALIBRATION WHICH SUPPLY INPUT SIGNALS TO THE GROUP 4 PRIMARY CONTAINMENT ISOLATION SYSTEM LOGIC.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.84	.00	.46	.00	.00	.00	.00	1.12
SCRAMS < 15% POWER	1	0	0	0	0	0	0	1
TOTAL SCRAMS	3	0	1	0	0	0	0	2
SAFETY SYSTEM ACTUATIONS	1	0	0	0	0	0	0	1
SIGNIFICANT EVENTS	0	0	0	0	0	0	1	1
SAFETY SYSTEM FAILURES	3	0	1	1	1	1	2	4
FORCED OUTAGE RATE (%)	.6	0	.2	0	0	.6	0	.11
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.92	.00	.46	.00	.00	.47	.00	1.12
CRITICAL HOURS	1088	2158	2155	2183	2208	2116	2160	890
COLLECTIVE RADIATION EXPOSURE	380	32	96	22	6	11	47	NA
CAUSE CODES:								
ADMINISTRATIVE	4	2	0	0	0	2	2	NA
LICENSED OPERATOR	1	0	0	0	0	0	0	NA
OTHER PERSONNEL	7	1	2	0	0	1	0	NA
MAINTENANCE	14	3	2	0	2	4	1	NA
A) MAINT PERSONNEL	3	0	0	0	0	1	0	NA
B) SURV AND TEST	6	3	1	0	0	1	1	NA
C) EQUIPMENT	4	0	1	0	2	2	0	NA
D) POTENTIAL MAINT	3	0	1	0	2	1	0	NA
DESIGN/INSTALLATION/FABRICATION	2	1	2	1	0	1	3	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

**TABLE 8.54  
MILLSTONE 2**

**PI EVENTS FOR 88-3**

NONE

**PI EVENTS FOR 88-4**

**SSA** 10/25/88 LER# 33688011 50.72#: 13809 POWER: 100  
DESC: MAINTENANCE TECH INSTALLED GROUNDING DEVICE ON LINE SIDE INSTEAD OF LOAD SIDE CAUSING LOSS OF ONSITE POWER. BOTH DIESELS STARTED AND LOADED BUSES.

**SE** 10/25/88 LER# 33688011 50.72#: 13809 POWER: 0  
DESC: LOSS OF ALL ONSITE VITAL A.C. POWER DUE TO A SINGLE FAILURE.

**SCRAM** 10/25/88 LER# 33688011 50.72#: 13809 POWER: 100  
DESC: LOSS OF ONSITE POWER CAUSED A REACTOR TRIP DUE TO TECH INSTALLING GROUNDING DEVICE ON LINE SIDE INSTEAD OF LOAD SIDE OF 4160V BREAKER.

**PI EVENTS FOR 89-1**

NONE

**PI EVENTS FOR 89-2**

**CSA** 04/30/89 LER# 33689005 50.72#: 15484 POWER: 0  
DESC: A PARTIAL SAFETY INJECTION ACTUATION SIGNAL OCCURRED WHILE A TEST MODULE WAS BEING INSTALLED IN THE ENGINEERED SAFETY FEATURES ACTUATION SYSTEM CABINET. THE ONLY EQUIPMENT THAT OPERATED WAS THE BORIC ACID TRANSFER PUMP.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.92	.46	.00	.00	.00	.46	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	2	1	0	0	0	1	0	0
SAFETY SYSTEM ACTUATIONS	0	0	3	0	0	1	0	1
SIGNIFICANT EVENTS	0	0	0	1	0	1	0	0
SAFETY SYSTEM FAILURES	0	0	1	0	0	0	0	0
FORCED OUTAGE RATE (%)	2	1	0	12	0	2	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.92	.46	.00	.66	.00	.00	.00	.00
CRITICAL HOURS	2169	2170	1037	1526	2208	2183	826	1560
COLLECTIVE RADIATION EXPOSURE	15	15	476	160	28	55	533	NA
CAUSE CODES:								
ADMINISTRATIVE	0	2	2	0	0	0	0	NA
LICENSED OPERATOR	0	0	0	0	0	0	0	NA
OTHER PERSONNEL	0	1	5	0	1	1	1	NA
MAINTENANCE	2	3	5	2	1	1	2	NA
A) MAINT PERSONNEL	0	1	4	0	0	1	0	NA
B) SURV AND TEST	0	0	2	0	1	0	1	NA
C) EQUIPMENT	2	2	0	2	0	0	1	NA
D) POTENTIAL MAINT	2	0	0	2	0	0	0	NA
DESIGN/INSTALLATION/FABRICATION	1	0	1	0	0	0	2	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

**TABLE 8.55**  
**MILLSTONE 3**

**PI EVENTS FOR 88-3**

NONE

**PI EVENTS FOR 88-4**

**SCRAM** 10/05/88 LER# 42388023 50.72#: 13623 POWER: 100  
DESC: MSIV CLOSED DURING MSIV TESTING CAUSING SCRAM DUE TO PROCEDURE NOT PLACING ADEQUATE JUMPERS TO PERFORM TEST.

**SSF** 11/18/88 LER# 42388026 50.72#: 14370 POWER: 100  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: CONDITIONS DISCOVERED THAT COULD CAUSE LOSS OF BOTH VITAL BUSES. MAIN GEN. BKR WOULD NOT TRIP UNDER CERTAIN CONDITIONS, LEAVING VITAL BUSES CONNECTED, VOLT/FREQ DECAY DURING COASTDOWN. DAMAGE TO BUSES.

**SCRAM** 12/29/88 LER# 42388028 50.72#: 14369 POWER: 75  
DESC: DURING DIESEL TESTING - CROSS-TIE BETWEEN VITAL AND NON-VITAL BUS OPENED CAUSING LOSS OF NON-VITAL BUS - POWER LOST TO CONTROL RODS (CRD) AND CRD UNLATCHED AND A SCRAM ON NEGATIVE FLUX RATE.

**PI EVENTS FOR 89-1**

**SSA** 02/17/89 LER# 42389005 50.72#: 14790 POWER: 0  
DESC: OPERATOR TOOK PZR PRESSURE SI BLOCK SWITCH TO RESET VERSUS BLOCK CAUSING SI INJECTION - INJECTION VALVE SHUT REMOTELY, BUT WOULD NOT SHUT COMPLETELY, HAD TO BE LOCALLY SHUT.

**PI EVENTS FOR 89-2**

**SCRAM** 05/11/89 LER# 42389009 50.72#: 15596 POWER: 100  
DESC: WHEN TESTING COMPUTER TURNED OFF THIS GENERATED A NEGATIVE RATE TRIP SCRAM DUE TO THE PROCEDURE NOT BEING ADEQUATE.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.46	.00	.74	.54	.00	1.14	.00	1.13
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	1	0	1	1	0	2	0	1
SAFETY SYSTEM ACTUATIONS	0	1	1	0	0	0	1	0
SIGNIFICANT EVENTS	0	0	1	1	0	0	0	0
SAFETY SYSTEM FAILURES	0	1	3	0	0	1	0	0
FORCED OUTAGE RATE (%)	1	0	3	16	0	23	13	15
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.46	.00	.00	1.07	.00	.57	.53	3.40
CRITICAL HOURS	2192	731	1359	1869	2208	1760	1900	882
COLLECTIVE RADIATION EXPOSURE	NA	NA	55	19	3	6	8	NA
CAUSE CODES:								
ADMINISTRATIVE	1	7	7	3	1	4	3	NA
LICENSED OPERATOR	0	5	2	2	0	0	3	NA
OTHER PERSONNEL	2	5	5	0	2	2	0	NA
MAINTENANCE	3	16	9	5	3	5	2	NA
A) MAINT PERSONNEL	1	4	5	0	0	0	0	NA
B) SURV AND TEST	2	9	3	3	2	3	2	NA
C) EQUIPMENT	0	1	1	2	1	2	0	NA
D) POTENTIAL MAINT	1	2	1	2	1	1	0	NA
DESIGN/INSTALLATION/FABRICATION	0	0	4	0	0	1	1	NA
EQUIPMENT FAILURE	0	0	0	0	0	1	0	NA

**TABLE 8.56  
MONTICELLO**

**PI EVENTS FOR 88-3**

NONE

**PI EVENTS FOR 88-4**

**SCRAM** 12/16/88 LER# 26388007 50.72#: 14263 POWER: 100  
DESC: A TURBINE TRIP ON HIGH REACTOR LEVEL SIGNAL CAUSED A REACTOR TRIP. THE CAUSE WAS A DEGRADED LEVEL TRANSMITTER PRESSURIZING VALVE.

**PI EVENTS FOR 89-1**

**SSF** 01/15/89 LER# 26389002 50.72#: POWER: 100  
SYSTEM: FIRE DETECTION SYSTEM  
DESC: THE FIRE DETECTION SYSTEM REMOTE ANNUNCIATOR SYSTEM WAS INOPERABLE FOR APPROX. 60 HOURS. POWER WAS INADVERTENTLY REMOVED FOR MODIFICATION ACTIVITY. ROOT CAUSE WAS INADEQUATE WORK CONTROLS.

**PI EVENTS FOR 89-2**

**SSF** 04/03/89 LER# 26389005 50.72#: 15193 POWER: 77  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: THE HPCI SYSTEM FAILED OPERABILITY TEST. THE CAUSE OF AN ISOLATION SIGNAL IS UNKNOWN AND THE ISOLATION COULD NOT BE DUPLICATED. THE SYSTEM WAS DECLARED INOPERABLE. RCIC WAS PREVIOUSLY DECLARED INOPERABLE BECAUSE OF POSSIBLE RELIEF PROBLEMS.

**SSF** 04/14/89 LER# 26389006 50.72#: POWER: 74  
SYSTEM: REACTOR CORE ISOLATION COOLING SYSTEM  
DESC: THE RCIC SYSTEM WAS DECLARED INOPERABLE DUE TO TURBINE STM SUPPLY LINE BEING FILLED WITH CONDENSATE. THE STEAM LINE WAS FILLED AS A RESULT OF A DRAIN POT LEVEL SWITCH TEST WHICH LEFT THE DRAIN VALVE SHUT. THE HPCI SYSTEM WAS OOS DUE TO MAINTENANCE.

**SCRAM** 06/19/89 LER# 50.72#: 15905 POWER: 58  
DESC: CHECK VALVE ON DISCHARGE OF 12" HFP FAILED TO SEAT WHEN PUMP SECURED FOR MAINTENANCE CAUSING REVERSE FLOW THROUGH PUMP AND A LOW REACTOR LEVEL SCRAM.

**SSF** 06/28/89 LER# 50.72#: 15978 POWER: 58  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: TESTING REVEALED THE POTENTIAL FOR HPCI FLOW DELIVERED TO THE REACTOR TO BE LESS THAN DESIGN BASIS REQUIREMENTS. A RWCU DISCHARGE TO FEEDWATER PIPING CHECK VALVE WAS FOUND TO BE LEAKING, WHICH COULD DEGRADE HPCI FLOW.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.45	.00	.00	.00	.00	.46	.00	.48
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	1	0	0	0	0	1	0	1
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	0	1	0	0	0	0	1	3
FORCED OUTAGE RATE (%)	1	0	0	0	0	1	0	5
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.45	.00	.00	.00	.00	.46	.00	.00
CRITICAL HOURS	2198	857	2184	2183	2208	2194	2160	2074
COLLECTIVE RADIATION EXPOSURE	31	428	47	24	23	16	21	NA
CAUSE CODES:								
ADMINISTRATIVE	0	5	1	1	0	0	2	NA
LICENSED OPERATOR	1	1	0	0	0	1	0	NA
OTHER PERSONNEL	0	2	3	0	0	0	1	NA
MAINTENANCE	1	6	2	1	0	0	4	NA
A) MAINT PERSONNEL	0	1	0	0	0	0	2	NA
B) SURV AND TEST	1	5	2	1	0	0	1	NA
C) EQUIPMENT	0	1	0	0	0	0	0	NA
D) POTENTIAL MAINT	0	0	1	0	0	0	1	NA
DESIGN/INSTALLATION/FABRICATION	1	3	0	1	1	1	1	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA



**TABLE 8.57  
NINE MILE PT. 1**

**PI EVENTS FOR 88-3**

NONE

**PI EVENTS FOR 88-4**

**EE** 11/18/88 LER# 22088020 50.72#: 14039 POWER: 0  
DESC: VOLTAGE DROP IN 125 VDC SYSTEM.

**SSF** 11/18/88 LER# 22088020 50.72#: 14039 POWER: 0  
SYSTEM: DC POWER SYSTEM - CLASS 1E  
DESC: 125V DC SYSTEM CAN NOT MEET ITS TECH. SPEC. DESIGN BASIS OF A MIN. BATTERY VOLTAGE OF 106 V BECAUSE OF UNDERSIZED CABLES. PLANS ARE TO REPLACE CABLES FROM THE BATTERIES TO THE MG SETS.

**PI EVENTS FOR 89-1**

**SSA** 03/08/89 LER# 22089002 50.72#: 14970 POWER: 0  
DESC: AUTO TRANSFER OF BUS DID NOT OCCUR. DIESEL TAGGED OUT AND DID NOT START. LOSS OF I&C BUS 130 WHEN OFFSITE TRANSFORMER WAS LOST CAUSING A LOW VOLT CONDITION.

**PI EVENTS FOR 89-2**

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	1.23	.00	.00	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	2	0	0	0	0	0	0
SAFETY SYSTEM ACTUATIONS	0	5	1	0	0	0	1	0
SIGNIFICANT EVENTS	0	1	0	0	0	1	0	0
SAFETY SYSTEM FAILURES	1	0	2	0	0	1	0	0
FORCED OUTAGE RATE (%)	0	28	100	100	100	100	100	100
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	1.85	.00	.00	.00	.00	.00	.00
CRITICAL HOURS	2208	1620	0	0	0	0	0	0
COLLECTIVE RADIATION EXPOSURE	17	32	283	236	152	133	56	NA
CAUSE CODES:								
ADMINISTRATIVE	1	8	4	4	2	2	4	NA
LICENSED OPERATOR	0	0	0	0	0	0	1	NA
OTHER PERSONNEL	1	4	3	0	0	1	0	NA
MAINTENANCE	3	10	6	4	1	2	4	NA
A) MAINT PERSONNEL	1	1	3	0	0	0	0	NA
B) SURV AND TEST	1	4	2	2	1	2	4	NA
C) EQUIPMENT	1	2	2	1	0	0	0	NA
D) POTENTIAL MAINT	1	5	1	1	0	0	0	NA
DESIGN/INSTALLATION/FABRICATION	0	3	3	2	1	1	0	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	1	NA

**TABLE 8.58**  
**NINE MILE PT. 2**

**PI EVENTS FOR 88-3**

**SSF** 07/15/88 LER# 41088032 50.72#: 12858 POWER: 100  
SYSTEM: REACTOR BUILDING ENVIRONMENTAL CONTROL SYSTEM  
DESC: DESIGN REVIEW REVEALED A SINGLE FAILURE THAT COULD DISABLE THE RX BUILDING COOLERS FOLLOWING A LOCA. RELAY DESIGN ERROR. THE STANDBY GAS TREATMENT SYSTEM'S OPERATION ALSO DEPENDS ON THESE COOLERS.

**SCRAM** 08/06/88 LER# 41088039 50.72#: 13130 POWER: 86  
DESC: EXCESS VIBRATION CAUSED A BREAK ON THE EHC OIL LINE AND RESULTED IN A TURBINE TRIP AND A REACTOR TRIP.

**SSF** 09/12/88 LER# 41088044 50.72#: POWER: 0  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: FAILURE TO ADEQUATELY SEPARATE CLASS 1E AND NON CLASS 1E CIRCUITRY RESULTS IN THE INOPERABILITY OF DIV I AND DIV II EMERGENCY DIESEL GENERATORS. INADEQUATE DESIGN REVIEW.

**SSF** 09/15/88 LER# 41088046 50.72#: 13534 POWER: 0  
SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
DESC: DESIGN ERROR DISCOVERED IN CONTROL ROOM EMERGENCY VENTILATION SYSTEM. DETERMINED THAT CONDITION EXISTED FOR FAILURE OF SYSTEM TO PROVIDE CONTROL HABITABILITY DURING ACCIDENT CONDITIONS.

**SSF** 09/26/88 LER# 41088052 50.72#: POWER: 62  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: DESIGN DEFICIENCY DISCOVERED IN 1E AUTO OPEN CIRCUIT OF ESSENTIAL SERVICE WATER MOV. 5 OF 6 PUMPS DECLARED INOPERABLE. NON 1E COMPONENTS INSTALLED IN CLASS 1E CIRCUIT COULD DISABLE ASSOC. PUMP.

**SSA** 09/29/88 LER# 41088054 50.72#: 13580 POWER: 64  
DESC: LOCA SIGNAL CAUSED LPSI RHR PUMP START DURING RESTORATION AFTER A TEST.

**PI EVENTS FOR 88-4**

**SSA** 10/08/88 LER# 41088043 50.72#: 13646 POWER: 0  
DESC: TECH HAD DIGITAL VOLT METER IN RESISTENCE MODE VERSUS VOLTAGE MODE CAUSING LOW REACTOR LEVEL SIGNAL HPCS START.

**SSF** 10/11/88 LER# 41088055 50.72#: POWER: 0  
SYSTEM: PRIMARY CONTAINMENT/UNDETERMINED SYSTEM  
DESC: PRIMARY CONTAINMENT INTEGRITY DISCOVERED TO BE IN A DEGRADED CONDITION. A PLUG WAS FOUND MISSING FROM A TEST CONNECTION ON THE DRYWELL HEAD SEAL ASSEMBLY BYPASSING ONE OF THE REQUIRED REDUNDANT SEALS.

**SSF** 11/23/88 LER# 41088065 50.72#: POWER: 0  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: EMERGENCY DIESEL GENERATORS DECLARED INOPERABLE UPON THE DISCOVERY OF NON-SAFETY RELATED POST LUBE PILOT VALVES HAD BEEN INSTALLED. EDG VENDOR ERROR.

**SSA** 12/26/88 LER# 41088062 50.72#: 14346 POWER: 0  
DESC: LOST ALL OFFSITE POWER WHEN PERFORMING MAINTENANCE ON ONE LINE AND STARTUP TRANSFORMER BLEW UP AND CAUGHT FIRE. DIESELS STARTED AND LOADED BUSES.

**PI EVENTS FOR 89-1**

**SE** 02/04/89 LER# 50.72#: 14648 POWER: 0  
DESC: PENETRATIONS HAVE BEEN FOUND WITHOUT SEALS AND WITH INADEQUATE SEALS. AS A RESULT, INTERNAL FLOODING BYPASS WATER TIGHT DAMS AND AFFECT ESF CABLING, HENCE ESF OPERABILITY.

**SSA** 02/19/89 LER# 41089006 50.72#: 14801 POWER: 0  
DESC: PRESSURE SPIKE WHEN BACKFILLING A LEVEL TRANSMITTER REFERENCE LEG CAUSED HPCS ACTUATION AND HPCS DIESEL GENERATOR TO START.

**TABLE 8.58 (CONT.)**  
**NINE MILE PT. 2 (CONT.)**

**PI EVENTS FOR 89-1 (CONT.)**

**SE** 02/23/89 LER# 50.72#: POWER: 0  
DESC: LOSS OF OFFSITE POWER WITH A SINGLE FAILURE IN 1 EDG COULD LEAD TO LOSS OF 2ND DUE TO FAILURE TO ISOLATE SW TRAINS AND SUBSEQUENT EDG UNDERCOOLING. CAUSED BY CONTROL LOGIC DESIGN FLAW WHICH SHOULD AUTOMATICALLY ISOLATE THE 2 SW DIV. (MR: 02/23/89)

**SSA** 02/28/89 LER# 41089004 50.72#: 14881 POWER: 0  
DESC: PORTION OF AN ELECTRICAL MAINTENANCE TEST PROCEDURE MISSED CAUSING THE DIVISION I LOW PRESSURE COOLANT INJECTION PUMP TO START.

**SSA** 03/21/89 LER# 41089010 50.72#: 15080 POWER: 0  
DESC: DEGRADED VOLTAGE ON 4160 EMERGENCY BUS 103 CAUSED DIESEL START AND LOAD TO BUS.

**PI EVENTS FOR 89-2**

**SSA** 04/13/89 LER# 41089014 50.72#: 15318 POWER: 99  
DESC: LOSS OF 13.8KV NON-SAFETY RELATED BUS CAUSED A REACTOR TRIP ON LOW REACTOR LEVEL HPCS AND RCIC INJECTIONS INITIATED AND MSIV CLOSED ON LOSS OF CONDENSER VACUUM.

**SCRAM** 04/13/89 LER# 41089014 50.72#: 15318 POWER: 99  
DESC: LOSS OF 13.8KV NON-SAFETY RELATED BUS DUE TO LOOSE WIRE CONNECTIONS IN THE MAIN GENERATOR POTENTIAL TRANSFORMER CAUSED A TURBINE TRIP REACTOR SCRAM.

**SCRAM** 04/22/89 LER# 41089009 50.72#: 15423 POWER: 100  
DESC: THE REACTOR TRIPPED DUE TO AN AVERAGE POWER RANGE MONITOR UPSCALE READING WHEN A PORTABLE HANDHELD RADIO WAS KEYPED NEXT TO THE EHC CABINET CAUSING MOVEMENT OF TURBINE CONTROL AND BYPASS VALVES.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	1.80	2.07	1.56	.56	.00	.00	.99
SCRAMS < 15% POWER	1	1	0	1	0	0	0	0
TOTAL SCRAMS	1	3	3	3	1	0	0	2
SAFETY SYSTEM ACTUATIONS	0	1	3	0	1	2	3	1
SIGNIFICANT EVENTS	0	0	1	0	0	0	2	0
SAFETY SYSTEM FAILURES	5	6	1	1	4	2	0	0
FORCED OUTAGE RATE (%)	NA	NA	NA	19	23	0	0	12
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	NA	NA	NA	1.69	1.68	.00	.00	.99
CRITICAL HOURS	1093	1113	1448	1279	1782	16	0	2020
COLLECTIVE RADIATION EXPOSURE	NA	NA	NA	NA	NA	NA	56	NA
CAUSE CODES:								
ADMINISTRATIVE	12	8	8	4	12	7	5	NA
LICENSED OPERATOR	1	8	3	1	3	0	1	NA
OTHER PERSONNEL	5	8	2	2	5	5	3	NA
MAINTENANCE	14	15	12	5	16	11	6	NA
A) MAINT PERSONNEL	0	4	3	0	3	2	1	NA
B) SURV AND TEST	12	8	7	3	7	7	5	NA
C) EQUIPMENT	0	6	1	3	9	2	1	NA
D) POTENTIAL MAINT	4	3	2	3	6	3	0	NA
DESIGN/INSTALLATION/FABRICATION	6	14	7	5	12	6	2	NA
EQUIPMENT FAILURE	0	0	0	1	4	0	1	NA

**TABLE 8.59**  
**NORTH ANNA 1**

**PI EVENTS FOR 88-3**

**SSA** 08/06/88 LER# 33888020 50.72#: 13131 POWER: 100  
DESC: RESERVE STATION TRANSFORMER AUTO TAP CHANGER DRIVE MOTOR FAILED CAUSED 90% UNDERVOLTAGE DUE TO NOT INCREASED VOLTAGE DURING TIME LIMIT CAUSING DIESEL START & LOAD BUS.

**SCRAM** 08/06/88 LER# 33888020 50.72#: 13131 POWER: 100  
DESC: A TAP CHANGER MOTOR ON THE EMERGENCY BUS FAILED CAUSING 'B' FEEDWATER REGULATING VALVE TO FAIL CLOSED LEADING TO A LOW SG LEVEL AND A REACTOR SCRAM.

**PI EVENTS FOR 88-4**

**SSF** 10/13/88 LER# 33888024 50.72#: 13718 POWER: 100  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: OPERATION WITH 2 COMPONENT COOLING WATER HXS INSTEAD OF ONE HX PER FSAR. THIS COULD RESULT IN A POTENTIAL LOSS OF ESW PUMPS OR INADEQUATE FLOW TO HXS. VARIOUS TIMES OVER LIFE OF BOTH NORTH ANNA 1,2

**PI EVENTS FOR 89-1**

**SE** 01/07/89 LER# 50.72#: POWER: 100  
DESC: INSTRUMENT AIR SYSTEM CONTAMINATION/DEGRADATION FROM WATER AND OIL. NORTH ANNA 2 LICENSED IN 1980. (MORNING REPORT: 01/13/89)

**SE** 02/25/89 LER# 50.72#: 14858 POWER: 76  
DESC: A STEAM GENERATOR TUBE PLUG FAILED. PRIMARY-TO-SECONDARY LEAK RATE REACHED APPROX 70 GPM. CAUSE OF PLUG FAILURE IS STILL UNDER INVESTIGATION.

**SSF** 02/25/89 LER# 33889005 50.72#: 14860 POWER: 76  
SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
DESC: THE RESIDUAL HEAT REMOVAL SYSTEM WAS RENDERED INOPERABLE WHEN THE SUCTION ISOLATION VALVE FAILED CLOSED DUE TO THE FAILURE OF THE HIGH PRESSURE AUTO-CLOSURE RELAY.

**SCRAM** 02/25/89 LER# 33889005 50.72#: 14858 POWER: 76  
DESC: AIR SUPPLY LINE TO "C" FRV FAILED CAUSING FF/SF MISMATCH/LOW SG LEVEL SCRAM. SUBSEQUENT SG TUBE LEAK FOUND AFTER SCRAM.

**SSA** 03/23/89 LER# 33889006 50.72#: 15006 POWER: 0  
DESC: PERSONNEL ERROR DID NOT PLACE BREAKER UNDERVOLTAGE SWITCHES IN THE BLOCKED POSITION DURING TESTING CAUSING ALTERNATE FEEDER BREAKER TO OPEN AND LOSS OF POWER TO EMERGENCY BUS H AND DIESEL START AND LOAD.

**PI EVENTS FOR 89-2**

**SSF** 04/14/89 LER# 33889008 50.72#: POWER: 0  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: ESSENTIAL SERVICE WATER FLOW WAS FOUND TO BE LESS THAN THAT REQUIRED BY THE FSAR (15,990 VS 18,000 GPM). UNDER DESIGN BASIS ACCIDENT CONDITIONS CONTAINMENT PRESSURIZATION REQUIREMENTS MAY NOT HAVE BEEN MET.

**SSA** 04/16/89 LER# 33889010 50.72#: 15352 POWER: 0  
DESC: A LEAD WAS INADVERTANTLY LIFTED FROM THE WRONG RELAY CAUSING A LOSS OF THE EMERGENCY BUS. THE DIESEL GENERATOR STARTED AND PICKED UP THE BUS.

**TABLE 8.59 (CONT.)**  
**NORTH ANNA 1 (CONT.)**

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.60	.00	.00	.46	.00	.75	.00
SCRAMS < 15% POWER	0	0	2	0	0	0	0	0
TOTAL SCRAMS	0	1	2	0	1	0	1	0
SAFETY SYSTEM ACTUATIONS	1	0	0	0	1	0	1	1
SIGNIFICANT EVENTS	1	0	0	0	0	0	2	0
SAFETY SYSTEM FAILURES	0	0	1	0	0	1	1	1
FORCED OUTAGE RATE (%)	88	25	37	0	6	0	10	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	3.88	1.19	.69	.00	.46	.00	.75	.00
CRITICAL HOURS	258	1680	1459	2183	2169	2209	1334	0
COLLECTIVE RADIATION EXPOSURE	287	145	31	10	8	10	174	NA
CAUSE CODES:								
ADMINISTRATIVE	4	1	5	3	0	7	1	NA
LICENSED OPERATOR	0	0	3	0	0	0	0	NA
OTHER PERSONNEL	0	0	3	0	0	0	4	NA
MAINTENANCE	4	3	14	1	1	5	5	NA
A) MAINT PERSONNEL	1	0	1	0	0	2	3	NA
B) SURV AND TEST	2	1	5	1	0	3	1	NA
C) EQUIPMENT	0	2	8	0	1	1	1	NA
D) PCTENTIAL MAINT	1	2	5	0	1	0	0	NA
DESIGN/INSTALLATION/FABRICATION	1	1	1	1	0	1	0	NA
EQUIPMENT FAILURE	0	1	1	0	0	0	0	NA

**TABLE 8.60**  
**NORTH ANNA 2**

**PI EVENTS FOR 88-3**

**SSA** 07/26/88 LER# 33938002 50.72#: 12965 POWER: 100  
DESC: COVER REPLACED IMPROPERLY CAUSED UNDERVOLTAGE RELAY CONTACTS TO STAY CLOSED CAUSING HIGH HEAD SAFETY INJECTION PUMP TO START.

**PI EVENTS FOR 88-4**

**SSF** 10/13/88 LER# 33883024 50.72#: 13718 POWER: 100  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: OPERATION WITH 2 COMPONENT COOLING WATER HXS INSTEAD OF ONE HX PER FSAR. THIS COULD RESULT IN A POTENTIAL LOSS OF ESW PUMPS OR INADEQUATE FLOW TO HXS. VARIOUS TIMES OVER LIFE OF BOTH NORTH ANNA 1,2

**PI EVENTS FOR 89-1**

**SE** 01/07/89 LER# 50.72#: POWER: 80  
DESC: INSTRUMENT AIR SYSTEM CONTAMINATION/DEGRADATION FROM WATER AND OIL. NORTH ANNA 2 LICENSED IN 1980. (MORNING REPORT: 01/13/89)

**PI EVENTS FOR 89-2**

**SSF** 04/03/89 LER# 33989007 50.72#: 15199 POWER: 0  
SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
DESC: COOLING WATER WAS LOST TO THE RHR HEAT EXCHANGERS (ABOUT 22 MINS.) WHEN THE COOLING WATER ISOLATION VALVES CLOSED, RESULTING IN A LOSS OF RHR CAPABILITY. AN INSTR. AIR SUPPLY VALVE WAS FOUND CLOSED. CAUSED BY A CONTRACTOR PAINTER BUMPED VALVE.

**SSA** 04/16/89 LER# 33889010 50.72#: 15352 POWER: 0  
DESC: A LEAD WAS INADVERTANTLY LIFTED FROM THE WRONG RELAY CAUSING A LOSS OF THE EMERGENCY BUS. THE DIESEL GENERATOR STARTED AND PICKED UP THE BUS.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	0	0	0	0	0
SAFETY SYSTEM ACTUATIONS	0	3	0	0	1	0	0	1
SIGNIFICANT EVENTS	0	1	0	0	0	0	1	0
SAFETY SYSTEM FAILURES	3	0	0	1	0	1	0	1
FORCED OUTAGE RATE (%)	0	0	0	0	0	0	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.00
CRITICAL HOURS	1297	1413	2135	2183	2208	2209	1205	1297
COLLECTIVE RADIATION EXPOSURE	287	145	31	10	8	10	174	NA
CAUSE CODES:								
ADMINISTRATIVE	4	2	2	4	0	6	1	NA
LICENSED OPERATOR	1	3	0	0	0	0	1	NA
OTHER PERSONNEL	0	2	1	2	1	1	1	NA
MAINTENANCE	6	6	5	3	1	5	2	NA
A) MAINT PERSONNEL	0	1	0	1	0	2	1	NA
B) SURV AND TEST	3	5	2	2	1	3	0	NA
C) EQUIPMENT	3	0	3	0	0	1	0	NA
D) POTENTIAL MAINT	3	1	2	0	0	0	1	NA
DESIGN/INSTALLATION/FABRICATION	1	2	1	2	0	1	0	NA
EQUIPMENT FAILURE	0	1	1	0	0	0	0	NA

TABLE 8.61

OCONEE 1

PI EVENTS FOR 88-3

**SCRAM** 07/05/88 LER# 26988009 50.72#: 12718 POWER: 100  
DESC: REACTOR TRIPPED WHEN MFP TRIPPED DUE TO CONDENSATE PUMP TRIP AFTER A TECHNICIAN CONDUCTED TESTING BEFORE PREREQUISITES WERE COMPLETE AND A VALVE IN THE ICS DID NOT OPEN DURING THE TRANSIENT.

PI EVENTS FOR 88-4

NONE

PI EVENTS FOR 89-1

**SCRAM** 01/02/89 LER# 26989001 50.72#: 14387 POWER: 100  
DESC: TECH FAILED TO FOLLOW PROCEDURE AND DID NOT BYPASS CHANNEL 'A' CAUSING HIGH RCS TEMP SCRAM DURING RPS CALIBRATION.

**SE** 01/03/89 LER# 26989002 50.72#: 14399 POWER: 0  
DESC: ELECTRICAL FIRE, LOSS OF FORCED COOLANT FLOW, AND EXCESSIVE COOLDOWN RATE.

**SSF** 01/03/89 LER# 26989002 50.72#: 14399 POWER: 26  
SYSTEM: INTEGRATED CONTROL SYSTEM  
DESC: THE INTEGRATED CONTROL SYSTEM (ICS) FAILED TO ACTUATE AFTER ALL RCS PUMPS TRIPPED AS A RESULT OF A SWITCHGEAR FIRE. THE FIRE DAMAGED THE ICS SIGNAL CABLES RESULTING IN ERRONEOUS SIGNALS.

**SSF** 01/07/89 LER# 26989003 50.72#: 14441 POWER: 0  
SYSTEM: REACTOR BUILDING ENVIRONMENTAL CONTROL SYSTEM  
DESC: REACTOR BUILDING COOLING UNITS DECLARED INOPERABLE, FAILED SURVEILLANCE TEST. DROP OUT PLATES FAILED TO SATISFY DESIGN REQUIREMENT AND SOME OF THE FUSIBLE LINKS WERE SOLID METAL. NO PREVIOUS TESTING.

**SSF** 03/01/89 LER# 26989006 50.72#: POWER: 100  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: A DESIGN STUDY FOUND THAT THE EMERGENCY POWER SWITCHING LOGIC SYSTEM COULD BE RENDERED INOPERABLE BY SINGLE RELAY FAILURE. THIS WOULD PREVENT THE BACKUP POWER SOURCE FROM SUPPLYING POWER TO THE MAIN FEEDER BUS UNDER CERTAIN ACCIDENT SCENARIOS.

PI EVENTS FOR 89-2

**SE** 06/07/89 LER# 26989009 50.72#: 15805 POWER: 0  
DESC: UNANALYZED PLANT CONDITION THAT COULD RESULT IN LOSS OF ALL AC POWER TO SAFETY-RELATED LOADS. EVENT INVOLVES UNITS 2 AND 3 ALSO.

**SSF** 06/07/89 LER# 26989009 50.72#: 15805 POWER: 100  
SYSTEM: MEDIUM-VOLTAGE POWER SYSTEM - CLASS 1E  
DESC: A DESIGN BASIS ANALYSIS REVIEW DETERMINED THAT SEVERAL CASES INVOLVING THE STANDBY BUS DURING A LOCA COULD RESULT IN A LOSS OF ELECTRICAL POWER. THE CASES INCLUDE DEGRADED OFF-SITE VOLTAGE AND FAILURE OF STBY BREAKER WITH ONE STBY BUS INOPERABLE.

**SSF** 06/08/89 LER# 26989010 50.72#: POWER: 100  
SYSTEM: MEDIUM-VOLTAGE POWER SYSTEM - CLASS 1E  
DESC: A DESIGN ENGINEERING ANALYSIS OF THE ADEQUACY OF THE CENTRAL SWITCHYARD AS AN OFFSITE POWER SUPPLY DETERMINED THAT IT IS NOT QUALIFIED AS SUCH DUE TO INADEQUATE PROTECTIVE RELAYING.

**SSF** 06/23/89 LER# 50.72#: 15943 POWER: 100  
SYSTEM: MEDIUM-VOLTAGE POWER SYSTEM - CLASS 1E  
DESC: AN ERROR IN A TEST PROCEDURE RESULTED IN BOTH INDEPENDENT TRAINS OF THE ON-SITE EMERGENCY POWER SYSTEM TO BE INOPERABLE. 21 MINUTES DURATION.

TABLE 8.61 (CONT.)

## OCONEE 1 (CONT.)

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.46	.00	.92	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	0	1	0	1	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	1	1
SAFETY SYSTEM FAILURES	0	1	1	1	0	0	3	3
FORCED OUTAGE RATE (%)	0	0	0	0	2	0	11	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	.00	.46	.00	1.83	.00
CRITICAL HOURS	1522	1375	2184	2183	2193	2209	1090	2183
COLLECTIVE RADIATION EXPOSURE	83	82	129	42	100	24	62	NA
CAUSE CODES:								
ADMINISTRATIVE	1	5	5	3	2	1	7	NA
LICENSED OPERATOR	0	2	0	0	0	0	2	NA
OTHER PERSONNEL	0	1	1	1	2	0	3	NA
MAINTENANCE	1	5	5	0	3	1	6	NA
A) MAINT PERSONNEL	1	1	0	0	2	1	2	NA
B) SURV AND TEST	0	2	4	0	1	0	3	NA
C) EQUIPMENT	0	2	2	0	0	0	0	NA
D) POTENTIAL MAINT	0	1	1	0	0	0	1	NA
DESIGN/INSTALLATION/FABRICATION	1	2	3	2	1	1	3	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA



TABLE 8.62

OCONEE 2

PI EVENTS FOR 88-3

**SCRAM** 08/26/81 LER# 27088003 50.72#: 17298 POWER: 100  
DESC: A LOOSE MOISTURE SEPARATER REHEATER LEVEL SWITCH CAUSED A FALSE HIGH LEVEL TURBINE TRIP AND A REACTOR SCRAM.

PI EVENTS FOR 88-4

NONE

PI EVENTS FOR 89-1

**SSF** 01/07/89 LER# 26989003 50.72#: 14441 POWER: 100  
SYSTEM: REACTOR BUILDING ENVIRONMENTAL CONTROL SYSTEM  
DESC: REACTOR BUILDING COOLING UNITS DECLARED INOPERABLE, FAILED SURVEILLANCE TEST. DROP OUT PLATES FAILED TO SATISFY DESIGN REQUIREMENT AND SOME OF THE FUSIBLE LINKS WERE SOLID METAL. NO PREVIOUS TESTING.

**SCRAM** 02/03/89 LER# 27089002 50.72#: 14635 POWER: 100  
DESC: INSTALLING FUSE IN 125 VDC TO EHC CAUSED TURBINE TRIP SCRAM DUE TO MANAGEMENT DEFICIENCY IN NOT DIRECTING HOW INDEPENDENT VERIFICATION WERE TO BE PERFORMED.

**SCRAM** 02/05/89 LER# 27089003 50.72#: 14653 POWER: 100  
DESC: TURBINE TRIP SCRAM WHILE CONDUCTING SURVEILLANCE TEST DUE TO UNKNOWN CAUSES. A SIMILAR TRIP OCCURRED AT UNIT 3 (LER 28788006) DUE TO AN UNKNOWN CAUSE.

**SSF** 03/01/89 LER# 26989006 50.72#: POWER: 15  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: A DESIGN STUDY FOUND THAT THE EMERGENCY POWER SWITCHING LOGIC SYSTEM COULD BE RENDERED INOPERABLE BY SINGLE RELAY FAILURE. THIS WOULD PREVENT THE BACKUP POWER SOURCE FROM SUPPLYING POWER TO THE MAIN FEEDER BUS UNDER CERTAIN ACCIDENT SCENARIOS.

PI EVENTS FOR 89-2

**SCRAM** 04/03/89 LER# 27089004 50.72#: 15194 POWER: 100  
DESC: PIECE OF THREADED STOCK FELL THREE STORIES ONTO THE CONDENSATE BOOSTER PUMP PRESSURE SWITCH. THE CONDENSATE BOOSTER PUMPS TRIPPED CAUSING MFP TRIP AND REACTOR TRIP DUE TO POOR HOUSEKEEPING A MANAGEMENT DEFICIENCY.

**SE** 06/07/89 LER# 50.72#: 15805 POWER: 0  
DESC: UNANALYZED PLANT CONDITION THAT COULD RESULT IN LOSS OF ALL AC POWER TO SAFETY-RELATED LOADS. EVENT INVOLVES UNITS 1 AND 3 ALSO.

**SSF** 06/07/89 LER# 26989009 50.72#: 15805 POWER: 0  
SYSTEM: MEDIUM-VOLTAGE POWER SYSTEM - CLASS 1E  
DESC: A DESIGN BASIS ANALYSIS REVIEW DETERMINED THAT SEVERAL CASES INVOLVING THE STANDBY BUS DURING A LOCA COULD RESULT IN A LOSS OF ELECTRICAL POWER. THE CASES INCLUDE DEGRADED OFF-SITE VOLTAGE AND FAILURE OF STBY BREAKER WITH ONE STBY BUS INOPERABLE.

**SSF** 06/08/89 LER# 26989010 50.72#: POWER: 999  
SYSTEM: MEDIUM-VOLTAGE POWER SYSTEM - CLASS 1E  
DESC: A DESIGN ENGINEERING ANALYSIS OF THE ADEQUACY OF THE CENTRAL SWITCHYARD AS AN OFFSITE POWER SUPPLY DETERMINED THAT IT IS NOT QUALIFIED AS SUCH DUE TO INADEQUATE PROTECTIVE RELAYING.

**SSF** 06/23/89 LER# 50.72#: 15943 POWER: 100  
SYSTEM: MEDIUM-VOLTAGE POWER SYSTEM - CLASS 1E  
DESC: AN ERROR IN A TEST PROCEDURE RESULTED IN BOTH INDEPENDENT TRAINS OF THE ON-SITE EMERGENCY POWER SYSTEM TO BE INOPERABLE. 21 MINUTES DURATION.

TABLE 8.62 (CONT.)

OCONEE 2 (CONT.)

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.51	.00	.93	.87
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	0	1	0	2	1
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	0	0
SIGNIFICANT EVENTS	0	0	0	1	0	0	0	1
SAFETY SYSTEM FAILURES	0	0	1	2	0	0	2	3
FORCED OUTAGE RATE (%)	1	0	0	3	0	0	2	7
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	.00	.51	.00	.93	2.62
CRITICAL HOURS	2192	2209	797	2003	1960	2209	2144	1147
COLLECTIVE RADIATION EXPOSURE	83	82	129	42	100	24	62	NA
CAUSE CODES:								
ADMINISTRATIVE	3	4	4	3	1	1	2	NA
LICENSED OPERATOR	0	2	0	0	0	0	0	NA
OTHER PERSONNEL	0	0	0	1	0	0	1	NA
MAINTENANCE	2	3	4	0	2	1	3	NA
A) MAINT PERSONNEL	2	1	1	0	1	1	1	NA
B) SURV AND TEST	0	2	2	0	0	0	1	NA
C) EQUIPMENT	0	0	1	0	1	0	0	NA
D) POTENTIAL MAINT	0	0	1	0	1	0	1	NA
DESIGN/INSTALLATION/FABRICATION	2	2	3	3	1	1	2	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

## TABLE 8.63

### OCONEE 3

#### PI EVENTS FOR 88-3

**SSF** 08/19/88 LER# 28788003 50.72#: 13240 POWER: 0  
SYSTEM: CONTAINMENT FAN COOLING SYSTEM  
DESC: PERFORMANCE OF THE REACTOR BUILDING COOLING UNITS HAS DEGRADED TO THE POINT WHERE THE SPECIFIED HEAT REMOVAL ABILITY AS ASSUMED IN THE FSAR WOULD NOT BE MEET FOLLOWING A LOCA.

**SE** 09/11/88 LER# 28788005 50.72#: 13426 POWER: 0  
DESC: LOSS OF RHR COOLING DURING TEST WHILE RCS WAS DRAINED TO MID-LOOP.

**SSF** 09/11/88 LER# 28788005 50.72#: 13426 POWER: 0  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: LOSS OF POWER DURING PERFORMANCE OF EMERG. POWER LOGIC TEST. ALTERNATE POWER SUPPLIES COULD NOT BE TRANSFERRED BECAUSE TEST EQUIP. CONNECTIONS AND THE TEST CONFIGURATION OF THE BRKS. RHR LOST 15 MIN.

#### PI EVENTS FOR 88-4

**SCRAM** 11/14/88 LER# 28788006 50.72#: 13988 POWER: 39  
DESC: A GROUNDED ONCE THROUGH STEAM GENERATOR HIGH LEVEL TRIP SIGNAL MONITOR CAUSED A TURBINE TRIP AND A REACTOR TRIP.

**SCRAM** 11/14/88 LER# 28788006 50.72#: 13980 POWER: 100  
DESC: A GROUNDED ONCE THROUGH STEAM GENERATOR HIGH LEVEL TRIP SIGNAL MONITOR CAUSED A TURBINE TRIP AND A REACTOR TRIP.

#### PI EVENTS FOR 89-1

**SSF** 01/07/89 LER# 26989003 50.72#: 14441 POWER: 100  
SYSTEM: REACTOR BUILDING ENVIRONMENTAL CONTROL SYSTEM  
DESC: REACTOR BUILDING COOLING UNITS DECLARED INOPERABLE, FAILED SURVEILLANCE TEST. DROP OUT PLATES FAILED TO SATISFY DESIGN REQUIREMENT AND SOME OF THE FUSIBLE LINKS WERE SOLID METAL. NO PREVIOUS TESTING.

**SE** 01/11/89 LER# 28789001 50.72#: 14474 POWER: 0  
DESC: REACTOR BUILDING COOLING UNIT WAS DECLARED INOPERABLE WHEN TWO OF THE THREE UNITS WERE FOUND TO BE FOULED, RESULTING IN A HEAT TRANSFER RATE BELOW SAFETY ANALYSES ASSUMPTIONS.

**SSF** 01/12/89 LER# 28789001 50.72#: 14474 POWER: 100  
SYSTEM: REACTOR BUILDING ENVIRONMENTAL CONTROL SYSTEM  
DESC: TESTING OF THE "A" AND "C" REACTOR BUILDING COOLING UNITS INDICATED AIR SIDE FOULING HAD OCCURRED. RENDERED SYSTEM INOPERABLE AS POST-LOCA COOLING MIGHT NOT HAVE BEEN SUFFICIENT.

**SSF** 03/01/89 LER# 26989006 50.72#: POWER: 100  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: A DESIGN STUDY FOUND THAT THE EMERGENCY POWER SWITCHING LOGIC SYSTEM COULD BE RENDERED INOPERABLE BY SINGLE RELAY FAILURE. THIS WOULD PREVENT THE BACKUP POWER SOURCE FROM SUPPLYING POWER TO THE MAIN FEEDER BUS UNDER CERTAIN ACCIDENT SCENARIOS.

**SCRAM** 03/06/89 LER# 28789002 50.72#: 14943 POWER: 100  
DESC: A LOSS OF GENERATOR EXCITATION CAUSED A MAIN TURBINE TRIP AND A SUBSEQUENT REACTOR TRIP. WATER HAMMER IN THE MAIN STEAM TURBINE BYPASS LINE DAMAGED THREE PIPE SUPPORTS.

#### PI EVENTS FOR 89-2

**SE** 06/07/89 LER# 26989009 50.72#: 15805 POWER: 0  
DESC: UNANALYZED PLANT CONDITION THAT COULD RESULT IN LOSS OF ALL AC POWER TO SAFETY-RELATED LOADS. EVENT INVOLVES UNITS 1 AND 2 ALSO.

TABLE 8.63 (CONT.)

OCONEE 3 (CONT.)

PI EVENTS FOR 89-2 (CONT.)

**SSF** 06/07/89 LER# 26989009 50.72#: 15805 POWER: 100  
 SYSTEM: MEDIUM-VOLTAGE POWER SYSTEM - CLASS 1E  
 DESC: A DESIGN BASIS ANALYSIS REVIEW DETERMINED THAT SEVERAL CASES INVOLVING THE STANDBY BUS DURING A LOCA  
 COULD RESULT IN A LOSS OF ELECTRICAL POWER. THE CASES INCLUDE DEGRADED OFF-SITE VOLTAGE AND  
 FAILURE OF STBY BREAKER WITH ONE STBY BUS INOPERABLE.

**SSF** 06/08/89 LER# 26989010 50.72#: POWER: 999  
 SYSTEM: MEDIUM-VOLTAGE POWER SYSTEM - CLASS 1E  
 DESC: A DESIGN ENGINEERING ANALYSIS OF THE ADEQUACY OF THE CENTRAL SWITCHYARD AS AN OFFSITE POWER SUPPLY  
 DETERMINED THAT IT IS NOT QUALIFIED AS SUCH DUE TO INADEQUATE PROTECTIVE RELAYING.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.91	.48	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	0	0	2	1	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	1	0	1	1
SAFETY SYSTEM FAILURES	0	0	1	1	2	0	3	2
FORCED OUTAGE RATE (%)	0	0	0	24	0	1	4	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	1.80	.84	.91	.96	.00
CRITICAL HOURS	2208	2209	2184	1667	1184	2195	2094	2183
COLLECTIVE RADIATION EXPOSURE	83	82	129	42	100	24	62	NA
CAUSE CODES:								
ADMINISTRATIVE	1	5	3	4	3	1	3	NA
LICENSED OPERATOR	0	2	0	0	0	0	0	NA
OTHER PERSONNEL	0	1	0	2	1	0	1	NA
MAINTENANCE	1	4	3	2	3	2	3	NA
A) MAINT PERSONNEL	1	2	0	1	1	1	1	NA
B) SURV AND TEST	0	3	2	1	2	0	1	NA
C) EQUIPMENT	0	0	1	1	1	0	1	NA
D) POTENTIAL MAINT	0	0	1	1	0	1	0	NA
DESIGN/INSTALLATION/FABRICATION	1	2	2	2	1	1	2	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

TABLE 8.64  
OYSTER CREEK

PI EVENTS FOR 88-3

**SSF** 07/21/88 LER# 21988014 50.72#: POWER: 0  
SYSTEM: MAIN STEAM ISOLATION VALVES  
DESC: DEGRADATION OF MAIN STEAM LINE ISOLATION CAPABILITY DUE TO LACK OF FULL SEAT CONTACT IN MSIV DUE TO PROCEDURAL INADEQUACY.

**SSF** 09/02/88 LER# 21988019 50.72#: 13356 POWER: 99  
SYSTEM: ISOLATION CONDENSER SYSTEM  
DESC: BOTH TRAINS OF THE ISOLATION CONDENSER SYSTEM INOPERABLE AT THE SAME TIME. ONE TRAIN WAS PREVIOUSLY OUT OF SERVICE FOR MAINTENANCE AND THE MANUAL VENT VALVE WAS FOUND CLOSED ON OTHER TRAIN. PERSONNEL.

**SE** 09/29/88 LER# 21988021 50.72#: 13576 POWER: 0  
DESC: BOTH "A" & "B" ISOLATION CONDENSERS DECLARED OUT OF SERVICE DUE TO WATER IN STEAM LINES. POTENTIAL ABNORMAL OCCURRENCE WHEN COMBINED WITH SUBSEQUENT FAULT ON "B" SIDE ELECTRICAL DISTRIBUTING PANEL.

**SSF** 09/29/88 LER# 21988021 50.72#: 13576 POWER: 99  
SYSTEM: ISOLATION CONDENSER SYSTEM  
DESC: BOTH ISOLATION CONDENSERS DECLARED INOPERABLE DUE TO THE DISCOVERY OF WATER IN THE STEAM VENT LINES. THIS CONDITION COULD RESULT IN TUBE RUPTURE IF CONDENSER REQUIRED TO PERFORM DHR FUNCTION.

PI EVENTS FOR 88-4

**SSA** 10/02/88 LER# 21988022 50.72#: 13603 POWER: 0  
DESC: FAULT ON "B" SIDE ELECTRICAL DISTRIBUTION - "B" DG DID NOT START AND LOAD THE BUS (REASON DG DID NOT START WAS A PROBLEM IN DG CABLING TO VITAL BUS).

**SE** 10/02/88 LER# 50.72#: 13603 POWER: 0  
DESC: FAULT ON "B" SIDE OF ELECTRICAL DISTRIBUTION PANEL CAUSED LOSS OF SEVERAL PUMPS USED FOR SHUTDOWN COOLING.

**SSF** 11/08/88 LER# 21988030 50.72#: 13927 POWER: 0  
SYSTEM: SECONDARY CONTAINMENT/UNDETERMINED SYSTEM  
DESC: LOSS OF SECONDARY CONTAINMENT DUE TO AN OPEN HEAT EXCHANGER HEAD. AIR FLOWED THROUGH HEAT EXCHANGER INTO SECONDARY CONTAINMENT. CAUSE NOT CLEAR, BUT SEEMS TO BE MISCOMMUNICATIONS BETWEEN OPS AND MAINT

PI EVENTS FOR 89-1

**SSF** 01/18/89 LER# 21989001 50.72#: POWER: 0  
SYSTEM: MAIN STEAM ISOLATION VALVES  
DESC: POSSIBLE LOSS OF MAIN STEAM LINE ISOLATION CAPABILITY DUE TO EXCESSIVE MAIN STEAM ISOLATION VALVE CONTROL AIR LEAKAGE (ACCUMULATORS). CAUSE: COMPONENT MATERIALS, ASSEMBLY METHOD, AND MAINT. PERFORMED.

**SSF** 03/03/89 LER# 21989008 50.72#: POWER: 999  
SYSTEM: CONTAINMENT ISOLATION CONTROL SYSTEM  
DESC: ALL 24 CONTAINMENT ISOLATION VALVES WERE DETERMINED TO BE IN A DEGRADED CONDITION AND COULD NOT BE CONSIDERED OPERABLE. A SPECIAL TEST WAS PERFORMED AND ALL VALVES FAILED TO MEET ACCEPTANCE CRITERIA. NO FORMAL SURVEILLANCE OR PM PROGRAM EXISTED.

**SSF** 03/09/89 LER# 21989009 50.72#: POWER: 0  
SYSTEM: CONTAINMENT SPRAY SYSTEM  
DESC: POTENTIAL LOSS OF ADEQUATE CONTAINMENT COOLING DURING A LOCA DUE TO A DESIGN DEFICIENCY IN THE CONTAINMENT SPRAY SYSTEM. LOGIC DESIGN WOULD PREVENT THE OPERATOR FROM COOLING THE TORUS DURING A DBA RESULTING IN TEMP. INCREASE AND LOSS OF HPSH TO PUMPS

**TABLE 8.64 (CONT.)**  
**OYSTER CREEK (CONT.)**

**PI EVENTS FOR 89-2**

**SSA** 05/18/89 LER# 21989015 50.72#: 15641 POWER: 100  
DESC: OPERATORS OVER-EXCITED MAIN GENERATOR. STARTUP TRANSFORMER DID NOT TRANSFER POWER AND DIESELS STARTED AND LOADED BUSES.

**SCRAM** 05/18/89 LER# 21989015 50.72#: 15641 POWER: 100  
DESC: OPERATORS OVER-EXCITED MAIN GENERATOR WHEN TRYING TO RESTORE GENERATOR VAR'S, DUE TO TECHNICIAN CONDUCTING TESTING WITHOUT INFORMING CONTROL ROOM OF WHEN HE WAS STARTING THE TEST, CAUSING GENERATOR/TURBINE REACTOR SCRAM.

**SCRAM** 06/25/89 LER# 21989016 50.72#: 15952 POWER: 97  
DESC: MAIN TRANSFORMER EXPERIENCED A SUDDEN PRESSURE INCREASE AND GROUND FAULT CAUSING A MAIN GENERATOR TRIP/TURBINE TRIP SCRAM.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.63	.00	.00	.00	.00	.00	.00	1.87
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	1	0	0	0	0	0	0	2
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	1	0	1
SIGNIFICANT EVENTS	1	0	0	0	1	1	0	0
SAFETY SYSTEM FAILURES	2	3	2	0	3	1	3	0
FORCED OUTAGE RATE (%)	30	59	0	0	37	100	85	55
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	1.26	.00	.00	.00	.70	.00	15.75	.94
CRITICAL HOURS	1584	952	2184	2183	1422	0	64	1069
COLLECTIVE RADIATION EXPOSURE	105	172	82	82	205	1131	569	NA
CAUSE CODES:								
ADMINISTRATIVE	2	2	2	3	3	7	5	NA
LICENSED OPERATOR	3	0	1	0	2	0	0	NA
OTHER PERSONNEL	1	3	0	2	1	2	1	NA
MAINTENANCE	6	6	2	3	9	7	5	NA
A) MAINT PERSONNEL	1	0	1	1	2	4	3	NA
B) SURV AND TEST	2	4	0	1	4	2	2	NA
C) EQUIPMENT	3	1	2	3	2	2	0	NA
D) POTENTIAL MAINT	3	2	0	0	2	2	0	NA
DESIGN/INSTALLATION/FABRICATION	2	3	2	1	4	0	6	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	2	NA

**TABLE 8.65**

**PALISADES**

**PI EVENTS FOR 88-3**

**SSF** 08/23/88 LER# 25588013 50.72#: 13267 POWER: 0  
 SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
 DESC: LICENSEE HAS DETERMINED THAT DURING WORK ACTIVITIES INVOLVING ELECTRICAL PENETRATION MODS, THE CONTROL ROOM EMERGENCY VENTILATION SYSTEM MAY NOT HAVE BEEN ABLE TO MEET THE DESIGN CRITERIA OF FSAR.

**SE** 09/03/88 LER# 25588015 50.72#: 13384 POWER: 0  
 DESC: FUEL BUNDLE INADVERTENTLY REMOVED FROM CORE DURING REMOVAL OF UPPER GUIDE STRUCTURE. INFORMATION CONCERNING THIS EVENT INCLUDED IN RE (50.72) 13367, 13374 AND 13384.

**PI EVENTS FOR 88-4**

**SSF** 10/07/88 LER# 25589008 50.72#: POWER: 80  
 SYSTEM: FUEL BUILDING ENVIRONMENTAL CONTROL SYSTEM  
 DESC: THE CHARCOAL ABSORBERS FOR THE SPENT FUEL POOL VENTILATION SYSTEM DID NOT MEET T.S. REQUIREMENT FOR REMOVAL EFFICIENCY (89.855% VS. 94% RQMT).

**SSF** 11/04/88 LER# 25588021 50.72#: POWER: 999  
 SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
 DESC: SINCE 02/05/88, SEVERAL SPURIOUS TRIPS OF THE ESW PUMPS HAVE OCCURRED. OVERCURRENT RELAY SETPOINTS IN ERROR. CONDITION COULD HAVE RESULTED IN A COMPLETE LOSS OF ESW PUMPS.

**PI EVENTS FOR 89-1**

**SSF** 03/03/89 LER# 25589005 50.72#: 14919 POWER: 90  
 SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
 DESC: LICENSEE DISCOVERED THAT THE TECH. SPEC. REQUIREMENTS FOR EDG FUEL OIL SUPPLY DID NOT MEET DESIGN BASIS. CAUSED BY FAILURE TO UPDATE DIESEL FUEL OIL CONSUMPTION CALCULATIONS FOR ADDED EQUIPMENT LOADING SINCE INITIAL PLANT DESIGN.

**PI EVENTS FOR 89-2**

**SSF** 04/12/89 LER# 25589008 50.72#: POWER: 80  
 SYSTEM: FUEL BUILDING ENVIRONMENTAL CONTROL SYSTEM  
 DESC: THE CHARCOAL ABSORBERS FOR THE SPENT FUEL POOL VENTILATION SYSTEM DID NOT MEET T.S. REQUIREMENT FOR REMOVAL EFFICIENCY (89.855% VS. 94% RQMT). THE T.S. REQUIREMENT FOR VERIFICATION OF EFFICIENCY TESTING RESULTS WERE ALSO NOT MET.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.57	.00	.00	.00	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	1	0	0	0	0	0	0	0
SAFETY SYSTEM ACTUATIONS	2	1	0	0	0	0	0	0
SIGNIFICANT EVENTS	1	0	0	0	1	0	0	0
SAFETY SYSTEM FAILURES	0	2	0	1	1	2	1	1
FORCED OUTAGE RATE (%)	23	56	29	5	0	61	34	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	3.41	1.89	.00	.48	.00	2.48	.69	.00
CRITICAL HOURS	1762	528	1574	2083	931	403	1445	2183
COLLECTIVE RADIATION EXPOSURE	37	302	95	29	338	279	57	NA
CAUSE CODES:								
ADMINISTRATIVE	5	5	5	2	3	0	2	NA
LICENSED OPERATOR	2	2	0	0	0	1	0	NA
OTHER PERSONNEL	5	1	1	1	4	3	1	NA
MAINTENANCE	10	4	5	2	7	5	2	NA
A) MAINT PERSONNEL	5	2	0	0	4	1	1	NA
B) SURV AND TEST	2	2	3	2	2	1	1	NA
C) EQUIPMENT	2	0	0	0	0	2	0	NA
D) POTENTIAL MAINT	3	1	2	0	2	3	1	NA
DESIGN/INSTALLATION/FABRICATION	3	3	0	3	1	2	3	NA
EQUIPMENT FAILURE	1	0	0	0	0	0	0	NA

**TABLE 8.66**  
**PALO VERDE 1**

**PI EVENTS FOR 88-3**

**SE** 07/06/88 LER# 52888010 50.72#: 12727 POWER: 0  
DESC: FAILURES OF AUXILIARY TRANSFORMER AND NONVITAL 13.8KV BUS DUE TO GROUND FAULT.

**SCRAM** 07/06/88 LER# 52888010 50.72#: 12727 POWER: 100  
DESC: AUXILIARY TRANSFORMER EXPLODED AND CAUGHT FIRE DEENERGIZING RCP'S CAUSING A REACTOR TRIP ON LOW DEPARTURE FROM NUCLEATE BOILING RATIO.

**SSF** 07/20/88 LER# 52888022 50.72#: POWER: 0  
SYSTEM: PRIMARY CONTAINMENT/UNDETERMINED SYSTEM  
DESC: BOLTS WHICH SECURE THE GASKET RETAINER PLATES ON THE TCVS FOR THE RHR HEAT EXCHANGERS SUBJECT TO STRESS CORROSION/HYDROGEN EMBRITTLEMENT. FAILURES WOULD RESULT IN LEAKAGE OF PCS > T.S. BOLTS SAME LOT

**SSA** 07/22/88 LER# 52888019 50.72#: 12917 POWER: 0  
DESC: MAINTENANCE PERSONNEL CAUSED POWER DIP ON 4160 BUS AND DIESEL 'B' STARTED AND LOADED BUS.

**SSF** 07/29/88 LER# 52888018 50.72#: 13025 POWER: 0  
SYSTEM: ENGINEERED SAFETY FEATURES ACTUATION SYSTEM  
DESC: APPROXIMATELY 18 TYPE MDR RELAY FAILURES IN THE NSSS ESFAS, BOP ESFAS AND RX TRIP SYSTEMS HAVE BEEN IDENTIFIED AT THE PALO VERDE UNITS. CONTAMINANTS PLATE OUT AND/OR CORROSION OCCURS ON INTERNALS.

**SCRAM** 08/21/88 LER# 52888021 50.72#: 13251 POWER: 75  
DESC: A MICROSWITCH IN THE STATOR COOLANT FLOW TRIP CIRCUIT FAILED CAUSING A TURBINE TRIP AND SUBSEQUENT REACTOR TRIP ON HIGH PRESSURIZER PRESSURE (DUE TO ABNORMAL STEAM BYPASS CONTROL VALVE OPERATION).

**SCRAM** 08/27/88 LER# 52888024 50.72#: 13308 POWER: 16  
DESC: THE REACTOR TRIPPED ON LOW SG LEVEL FOLLOWING A MFP TRIP ON HIGH DISCHARGE PRESSURE. THE PLANT HAD JUST BEEN STABILIZED FROM A TRANSIENT CAUSED WHEN POWER INCREASED ABOVE THE SWAP OVER SETPOINT WITH ECONOMIZER VALVES SHUT.

**PI EVENTS FOR 88-4**

**NONE**

**PI EVENTS FOR 89-1**

**SCRAM** 03/05/89 LER# 52889004 50.72#: 14938 POWER: 100  
DESC: REACTOR SCRAM ON LOW DNBR SIGNAL DUE TO A FAILURE OF A CONTROL ELEMENT ASSEMBLY CALCULATOR. DURING THE EVENT A LOSS OF 13.8KV BUS OCCURRED DUE TO A FIRE RELATED TO ITS FEEDER BREAKER TRIP COIL.

**PI EVENTS FOR 89-2**

**NONE**



**TABLE 8.66 (CONT.)**  
**PALO VERDE 1 (CONT.)**

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	1.00	3.07	.00	.66	.00
SCRAMS < 15% POWER	1	0	0	0	0	0	0	0
TOTAL SCRAMS	1	0	0	2	3	0	1	0
SAFETY SYSTEM ACTUATIONS	0	0	1	0	1	0	0	0
SIGNIFICANT EVENTS	1	0	0	0	1	0	0	0
SAFETY SYSTEM FAILURES	0	0	2	1	2	0	0	0
FORCED OUTAGE RATE (%)	38	0	69	9	60	0	30	100
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	1.72	1.00	2.05	.00	.66	.00
CRITICAL HOURS	1389	47	580	1999	976	2208	1522	0
COLLECTIVE RADIATION EXPOSURE	91	345	152	148	15	11	23	NA
CAUSE CODES:								
ADMINISTRATIVE	2	3	10	2	2	3	2	NA
LICENSED OPERATOR	1	0	1	3	2	0	1	NA
OTHER PERSONNEL	1	2	2	1	1	1	0	NA
MAINTENANCE	4	4	9	3	3	4	2	NA
A) MAINT PERSONNEL	1	1	4	1	2	0	1	NA
B) SURV AND TEST	2	3	5	0	1	2	1	NA
C) EQUIPMENT	2	0	1	1	1	0	0	NA
D) POTENTIAL MAINT	1	0	1	1	1	2	0	NA
DESIGN/INSTALLATION/FABRICATION	2	0	4	0	1	0	2	NA
EQUIPMENT FAILURE	0	0	0	1	0	0	2	NA

**TABLE 8.67**  
**PALO VERDE 2**

**PI EVENTS FOR 88-3**

**SSF** 07/20/88 LER# 52888022 50.72#: POWER: 999  
SYSTEM: PRIMARY CONTAINMENT/UNDETERMINED SYSTEM  
DESC: BOLTS WHICH SECURE THE GASKET RETAINER PLATES ON THE TCVS FOR THE RHR HEAT EXCHANGERS SUBJECT TO STRESS CORROSION/HYDROGEN EMBRITTELEMENT. FAILURES WOULD RESULT IN LEAKAGE OF PCS > T.S. BOLTS SAME LOT

**SSA** 07/26/88 LER# 52988006 50.72#: 12959 POWER: 100  
DESC: WIND BLEW PORTABLE DUCT ONTO MAIN TRANSFORMER CAUSING LOSS OF "B" 13.8KV TRAIN DUE TO INADEQUATE DESIGN OF DUCTING. 'B' DIESEL STARTED AND LOADED ESF BUS.

**SSF** 07/29/88 LER# 52888018 50.72#: 13025 POWER: 100  
SYSTEM: ENGINEERED SAFETY FEATURES ACTUATION SYSTEM  
DESC: APPROXIMATELY 18 TYPE MDR RELAY FAILURES IN THE NSSS ESFAS, BOP ESFAS AND RX TRIP SYSTEMS HAVE BEEN IDENTIFIED AT THE PALO VERDE UNITS. CONTAMINATES PLATE OUT AND/OR CORROSION OCCURS ON INTERNALS.

**PI EVENTS FOR 88-4**

**SCRAM** 11/16/88 LER# 52988014 50.72#: 14003 POWER: 10  
DESC: THE REACTOR TRIPPED ON LOW SG LEVEL WHILE SHUTTING DOWN. FEED PUMP SPEED WAS TOO LOW FOR PLANT CONDITIONS CAUSING LOW FEEDWATER FLOW AND FINALLY A LOW SG LEVEL.

**PI EVENTS FOR 89-1**

**SSA** 01/03/89 LER# 52989001 50.72#: 14400 POWER: 100  
DESC: LIGHTNING STRIKE CAUSED LOSS OF OFFSITE POWER AND DIESEL START AND LOAD BUSES - REACTOR DID NOT SCRAM.

**SSA** 02/16/89 LER# 52989003 50.72#: 14771 POWER: 100  
DESC: THE FEEDWATER REGULATING VALVE STUCK CAUSING A LOW SG LEVEL AND AUXILIARY FEEDWATER ACTUATION. THE SG THEN OVERFED CAUSING A SAFETY INJECTION ACTUATION, CONTAINMENT ISOLATION, AND MAIN STEAM ISOLATION.

**SCRAM** 02/16/89 LER# 52989003 50.72#: 14771 POWER: 100  
DESC: CONTROLLER ON FEEDWATER REGULATING VALVE STUCK CAUSING A LOW SG LEVEL SCRAM.

**PI EVENTS FOR 89-2**

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.68	.00
SCRAMS < 15% POWER	0	1	0	0	0	1	0	0
TOTAL SCRAMS	0	1	0	0	0	1	1	0
SAFETY SYSTEM ACTUATIONS	0	0	2	0	1	0	2	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	0	0	2	0	2	0	0	0
FORCED OUTAGE RATE (%)	1	0	0	0	0	9	17	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.49	.68	.00
CRITICAL HOURS	2180	2146	1202	311	2208	2029	1475	44
COLLECTIVE RADIATION EXPOSURE	NA	NA	152	148	15	11	23	NA
CAUSE CODES:								
ADMINISTRATIVE	1	3	4	4	2	2	1	NA
LICENSED OPERATOR	1	0	4	0	0	0	1	NA
OTHER PERSONNEL	1	2	2	3	1	2	1	NA
MAINTENANCE	2	5	9	4	1	3	1	NA
A) MAINT PERSONNEL	0	2	2	0	0	0	1	NA
B) SURV AND TEST	1	1	6	4	1	2	1	NA
C) EQUIPMENT	0	1	1	0	0	1	1	NA
D) POTENTIAL MAINT	1	2	2	0	0	1	0	NA
DESIGN/INSTALLATION/FABRICATION	2	1	3	1	3	2	2	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	1	NA

**TABLE 8.68  
PALO VERDE 3**

**PI EVENTS FOR 88-3**

**SSF** 07/20/88 LER# 52888022 50.72#: POWER: 999  
 SYSTEM: PRIMARY CONTAINMENT/UNDETERMINED SYSTEM  
 DESC: BOLTS WHICH SECURE THE GASKET RETAINER PLATES ON THE TCVS FOR THE RHP HEAT EXCHANGERS SUBJECT TO STRESS CORROSION/HYDROGEN EMBRITTLEMENT. FAILURES WOULD RESULT IN LEAKAGE OF PCS > T.S. BOLTS SAME LOT

**SSF** 07/29/88 LER# 52888018 50.72#: 13025 POWER: 98  
 SYSTEM: ENGINEERED SAFETY FEATURES ACTUATION SYSTEM  
 DESC: APPROXIMATELY 18 TYPE MDR RELAY FAILURES IN THE WSSS ESFAS, BOP ESFAS AND RX TRIP SYSTEMS HAVE BEEN IDENTIFIED AT THE PALO VERDE UNITS. CONTAMINANTS PLATE OUT AND/OR CORROSION OCCURS ON INTERNALS.

**PI EVENTS FOR 88-4**

NONE

**PI EVENTS FOR 89-1**

**SSA** 03/03/89 LER# 53089001 50.72#: 14912 POWER: 45  
 DESC: A GRID DISTURBANCE RESULTED IN THE MAIN GENERATOR BREAKER OPENING, A REACTOR POWER CUTBACK, A REACTOR TRIP, A TURBINE TRIP, AND SAFETY INJECTION AND CONTAINMENT ISOLATION ON LOW PRESSURIZER PRESSURE.

**SE** 03/03/89 LER# 53089001 50.72#: 14912 POWER: 0  
 DESC: UNIT 3 HAD SEVERAL EQUIPMENT FAILURES FOLLOWING A LOAD REJECT: FAILURE OF FAST TRANSFER TO REACTOR COOLANT PUMPS, FAILURE OF ADVS TO OPEN ON LOSS OF CONDENSER, FAILURE OF SEVERAL DRAIN VALVES AND LEAKAGE IN RCP SEAT. (AIT TO SITE).

**SCRAM** 03/03/89 LER# 53089001 50.72#: 14912 POWER: 45  
 DESC: A GRID DISTURBANCE RESULTED IN THE MAIN GENERATOR BREAKER OPENING, A REACTOR POWER CUTBACK, AND A REACTOR TRIP ON LOW SG PRESSURE WHEN A STEAM BYPASS CONTROL SYSTEM FAILURE OCCURRED.

**PI EVENTS FOR 89-2**

**SSF** 05/03/89 LER# 53089007 50.72#: 15518 POWER: 0  
 SYSTEM: ENGINEERED SAFETY FEATURES ACTUATION SYSTEM  
 DESC: FAILURE OF 25 PERCENT OF POTTER AND BRUMFIELD MDR RELAYS INSTALLED IN THE NSSS ESFAS, BOP ESFAS AND REACTOR TRIP SWITCHGEAR OCCURED DURING POST-INSTALLATION TESTING. THESE RELAYS CONTROL ESF ACTUATION CONTROL OF VALVES, MOTORS, DAMPERS AND EDG'S.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	1.06	.00	.00	.00	.00	.90	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	1	0	0	0	0	1	0
SAFETY SYSTEM ACTUATIONS	0	0	0	1	0	0	1	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	1	0
SAFETY SYSTEM FAILURES	1	0	1	0	2	0	0	1
FORCED OUTAGE RATE (%)	NA	NA	0	0	20	0	31	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	NA	NA	.00	.00	.00	.00	1.81	.00
CRITICAL HOURS	0	946	2184	2184	1794	2208	1106	0
COLLECTIVE RADIATION EXPOSURE	NA	NA	NA	NA	NA	NA	23	NA
CAUSE CODES:								
ADMINISTRATIVE	1	0	3	1	0	0	0	NA
LICENSED OPERATOR	0	0	0	0	0	0	1	NA
OTHER PERSONNEL	0	0	2	0	3	0	0	NA
MAINTENANCE	0	2	5	1	3	0	2	NA
A) MAIN PERSONNEL	0	0	2	0	2	0	0	NA
B) SURV AND TEST	0	0	3	1	1	0	1	NA
C) EQUIPMENT	0	2	0	0	0	0	0	NA
D) POTENTIAL MAINT	0	2	0	0	0	0	1	NA
DESIGN/INSTALLATION/FABRICATION	2	0	3	0	0	1	3	NA
EQUIPMENT FAILURE	0	2	0	0	0	0	1	NA

**TABLE 8.69**  
**PEACH BOTTOM 2**

**PI EVENTS FOR 88-3**

**SSF** 07/01/88 LER# 27780016 50.72#: 12708 POWER: 0  
SYSTEM: MEDIUM-VOLTAGE POWER SYSTEM - CLASS 1E  
DESC: UV RELAY PROTECTION TO THE 4.16KV BUS FEEDERS AND TIME DELAY RELAY SETPOINTS INADEQUATE CAUSED BY DESIGN ERROR. MAY HAVE RESULTED IN SAFETY SYSTEM EQUIPMENT DAMAGE: ESW,LPCS,RHR/LPSI.

**SSA** 07/29/88 LER# 27788020 50.72#: 13034 POWER: 0  
DESC: LOSS OF OFFSITE POWER DUE TO TRANSFORMER SHORTING BETWEEN NORTH AND SOUTH SUBSTATIONS DIESELS STARTED AND ASSUMED LOADS.

**SE** 09/15/88 LER# 27788022 50.72#: 13488 POWER: 0  
DESC: DISCOVERY OF A GENERIC DEFECT THAT MAY PREVENT THE PROPER OPERATION OF 4160 VAC EMERGENCY BUS BREAKERS DURING A SEISMIC EVENT, RESULTING IN A PARTIAL OR TOTAL STATION BLACKOUT (EDG'S POTENTIALLY UNAVAILABLE).

**SSF** 09/19/88 LER# 27788022 50.72#: POWER: 0  
SYSTEM: MEDIUM-VOLTAGE POWER SYSTEM - CLASS 1E  
DESC: 4160 VAC ELEVATOR MECHANISM POSITION INDICATOR FOUND DISTORTED. OTHER BREAKER COMPARTMENTS ALSO FOUND TO HAVE CONDITION. ALLOWS CELL SWITCH ACTUATOR ARM TO FALL INTO AN INTERMEDIATE POSITION. DESIGN

**PI EVENTS FOR 88-4**

**SSA** 11/04/88 LER# 27788028 50.72#: 13918 POWER: 0  
DESC: START SIGNAL TO A & C RHR PUMP STARTED IN THE LPCI MODE DUE TO AN ERROR BY THE TEST ENGINEER WHO PLACED A JUMPER ON THE WRONG TERMINAL BLOCK.

**PI EVENTS FOR 89-1**

**SSF** 02/02/89 LER# 27789002 50.72#: POWER: 0  
SYSTEM: ULTIMATE HEAT SINK SYSTEM  
DESC: EMERGENCY COOLING SYSTEM (ULTIMATE HEAT SINK) INOPERABLE DUE TO INADEQUATE DESIGN INSTALLATION AND TESTING WHICH COULD RESULT IN THE LOSS OF REDUNDANT SAFE SHUTDOWN EQUIPMENT WHEN NORMAL HEAT SINK IS LOST.

**SSF** 02/09/89 LER# 27789006 50.72#: POWER: 0  
SYSTEM: CONTAINMENT PURGE SYSTEM  
DESC: CONTAINMENT PURGE SYSTEM OPERATION MAY BE DEGRADED DURING POST-LOCA EVENTS DUE TO INADEQUATE SUPPORTS ON THE SAFETY RELATED PNEUMATIC SUPPLY TUBING TO VARIOUS ISOLATION VALVES. INADEQUATE SUPPORTS DUE TO PLANT MODIFICATION AND CONFIGURATION CONTROL.

**SSF** 03/20/89 LER# 27789004 50.72#: 15216 POWER: 0  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: THE HPCI SYSTEM MAY NOT PERFORM ITS SAFETY FUNCTION DURING DESIGN BASIS EVENTS WHERE REDUCED DC POWER AND HIGH AMBIENT TEMP. OCCUR AT THE TURBINE STEAM ADMISSION VALVE AND PUMP DISCHARGE ISOLATION VALVE. INSUFFICIENT STARTING CURRENT AVAILABLE.

**PI EVENTS FOR 89-2**

**SSF** 04/06/89 LER# 27789005 50.72#: POWER: 0  
SYSTEM: LOW-VOLTAGE POWER SYSTEM - CLASS 1E  
DESC: PULL APART TERMINAL BLOCKS LOCATED IN 250 VDC AND 480 VAC MOTOR CONTROL CENTER BREAKER COMPARTMENTS DID NOT MEET SEISMIC REQUIREMENTS. INITIAL DESIGN REQUIRED ADDITIONAL FASTENING SCREWS BUT SUBSEQUENT WORK RESULTED IN LOSS OF OVER HALF OF THE SCREWS

**SSF** 04/11/89 LER# 27789007 50.72#: 15289 POWER: 0  
SYSTEM: MEDIUM-VOLTAGE POWER SYSTEM - CLASS 1E  
DESC: WHILE PLACING THE STARTUP SOURCE AND EMERGENCY BUS IN SERVICE, GREEN DISCOLORATION WAS FOUND IN THE GREASE ON THE STABS OF SEVERAL CONTROL FUSES. THIS MAY CAUSE A VOLTAGE DROP BEYOND WHAT IS ASSUMED IN THE DESIGN ANALYSIS.

**TABLE 8.69 (CONT.)**  
**PEACH BOTTOM 2 (CONT.)**

**PI EVENTS FOR 89-2 (CONT.)**

**SSF** 05/05/89 LER# 27789009 50.72#: 15541 POWER: 4  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: DURING PERFORMANCE OF A TECH. SPEC. SURVEILLANCE TEST ON THE HPCI SYSTEM THE HPCI FLOW CONTROLLER FAILED HIGH DUE TO AN ELECTRICAL MALFUNCTION, THE HPCI SYSTEM WAS DECLARED INOPERABLE. THE INSTALLED ANALOG ISOLATOR WAS FOUND TO BE WIRED INCORRECTLY.

**SCRAM** 05/19/89 LER# 27789012 50.72#: 15652 POWER: 24  
DESC: FAILURE OF A CONTACT IN THE REACTOR LEVEL CONTROL CIRCUITRY INDICATED A LEVEL ERROR CAUSING MFP TO RAISE LEVEL TO HIGH LEVEL MFP TRIP SETPOINT AND SUBSEQUENT SCRAM ON LOW REACTOR LEVEL.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.74
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	0	0	0	0	1
SAFETY SYSTEM ACTUATIONS	0	0	1	0	1	1	0	0
SIGNIFICANT EVENTS	0	0	0	1	1	0	0	0
SAFETY SYSTEM FAILURES	5	2	1	0	2	0	3	3
FORCED OUTAGE RATE (%)	100	0	0	0	0	0	0	6
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	1.47
CRITICAL HOURS	0	0	0	0	0	0	0	1359
COLLECTIVE RADIATION EXPOSURE	202	291	360	434	214	151	58	NA
CAUSE CODES:								
ADMINISTRATIVE	2	3	2	3	4	7	3	NA
LICENSED OPERATOR	0	0	1	0	0	0	1	NA
OTHER PERSONNEL	4	5	1	4	2	3	1	NA
MAINTENANCE	6	8	5	7	4	8	4	NA
A) MAINT PERSONNEL	4	3	2	2	2	2	2	NA
B) SURV AND TEST	0	2	1	5	1	5	2	NA
C) EQUIPMENT	0	1	2	0	2	0	1	NA
D) POTENTIAL MAINT	2	2	2	0	2	2	0	NA
DESIGN/INSTALLATION/FABRICATION	2	4	1	1	3	3	3	NA
EQUIPMENT FAILURE	3	2	0	0	1	0	0	NA

**TABLE 8.70**  
**PEACH BOTTOM 3**

**PI EVENTS FOR 88-3**

**SSF** 07/01/88 LER# 27788016 50.72#: 12708 POWER: 0  
 SYSTEM: MEDIUM-VOLTAGE POWER SYSTEM - CLASS 1E  
 DESC: UV RELAY PROTECTION TO THE 4.16KV BUS FEEDERS AND TIME DELAY RELAY SETPOINTS INADEQUATE CAUSED BY DESIGN ERROR. MAY HAVE RESULTED IN SAFETY SYSTEM EQUIPMENT DAMAGE: ESW,LPCS,RHR/LPS1.

**SSA** 07/29/88 LER# 27788020 50.72#: 13034 POWER: 0  
 DESC: LOSS OF OFFSITE POWER DUE TO TRANSFORMER SHORTING BETWEEN NORTH AND SOUTH SUBSTATIONS. DIESEL STARTED AND LOADED BUS.

**SSA** 08/31/88 LER# 27888009 50.72#: 13339 POWER: 0  
 DESC: STARTUP FEED BREAKER OP'NED AND ON OTHER LEG OFFSITE POWER WAS UNAVAILABLE CAUSED DIESEL START AND LOAD.

**SE** 09/15/88 LER# 27788022 50.72#: 13488 POWER: 0  
 DESC: DISCOVERY OF A GENERIC DEFECT THAT MAY PREVENT THE PROPER OPERATION OF 4160 VAC EMERGENCY BUS BREAKERS DURING A SEISMIC EVENT, RESULTING IN A PARTIAL OR TOTAL STATION BLACKOUT (EDG'S POTENTIALLY UNAVAILABLE).

**SSF** 09/19/88 LER# 27788022 50.72#: POWER: 0  
 SYSTEM: MEDIUM-VOLTAGE POWER SYSTEM - CLASS 1E  
 DESC: 4160 VAC ELEVATOR MECHANISM POSITION INDICATOR FOUND DISTORTED. OTHER BREAKER COMPARTMENTS ALSO FOUND TO HAVE CONDITION. ALLOWS CELL SWITCH ACTUATOR ARM TO FALL INTO AN INTERMEDIATE POSITION. DESIGN

**PI EVENTS FOR 88-4**

NONE

**PI EVENTS FOR 89-1**

**SSF** 02/02/89 LER# 27789002 50.72#: 15233 POWER: 0  
 SYSTEM: ULTIMATE HEAT SINK SYSTEM  
 DESC: EMERGENCY COOLING SYSTEM (ULTIMATE HEAT SINK) INOPERABLE DUE TO INADEQUATE DESIGN INSTALLATION AND TESTING WHICH COULD RESULT IN THE LOSS OF REDUNDANT SAFE SHUTDOWN EQUIPMENT WHEN NORMAL HEAT SINK IS LOST.

**PI EVENTS FOR 89-2**

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	0	0	0	0	0
SAFETY SYSTEM ACTUATIONS	0	1	0	0	2	0	0	0
SIGNIFICANT EVENTS	0	0	0	1	1	0	0	0
SAFETY SYSTEM FAILURES	2	1	0	0	2	0	1	0
FORCED OUTAGE RATE (%)	100	0	0	0	0	0	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.00
CRITICAL HOURS	0	0	0	0	0	0	0	0
COLLECTIVE RADIATION EXPOSURE	202	291	360	434	214	151	58	NA
CAUSE CODES:								
ADMINISTRATIVE	0	3	1	1	2	4	1	NA
LICENSED OPERATOR	0	0	0	0	0	0	0	NA
OTHER PERSONNEL	2	4	1	3	3	2	1	NA
MAINTENANCE	3	6	1	6	6	4	2	NA
A) MAINT PERSONNEL	2	2	1	1	3	2	0	NA
B) SURV AND TEST	0	3	0	3	1	2	2	NA
C) EQUIPMENT	1	1	0	2	2	0	0	NA
D) POTENTIAL MAINT	1	0	0	1	1	0	0	NA
DESIGN/INSTALLATION/FABRICATION	1	3	1	3	2	2	2	NA
EQUIPMENT FAILURE	1	0	0	0	0	0	0	NA

## TABLE 8.71

### PERRY

#### PI EVENTS FOR 88-3

- SSF** 08/12/88 LER# 44088029 50.72#: 13178 POWER: 90  
SYSTEM: STANDBY LIQUID CONTROL SYSTEM  
DESC: BOTH TRAINS OF THE STANDBY LIQUID CONTROL SYSTEM WERE OUT OF SERVICE ABOUT 2 HOURS. DURING TESTING AN OPERATOR FORGOT TO RETURN TRAIN "B" TO SERVICE BEFORE REMOVING TRAIN "A".
- SSF** 08/26/88 LER# 44088032 50.72#: POWER: 100  
SYSTEM: REACTOR CONTAINMENT BUILDING  
DESC: FAILURE OF BALL VALVE AND DOOR SEAL RESULTS IN INOPERABLE CONTAINMENT AIRLOCK DOORS. LOSS OF CONTAINMENT INTEGRITY WHILE TECH. EXITED THROUGH AIRLOCK DOORS. LACK OF VALVE PM. LER IS MARKED SO CODED.
- SE** 09/04/88 LER# 50.72#: 13377 POWER: 70  
DESC: FIRE IN CHARCOAL ADSORBERS OF WASTE GAS SYSTEM.
- SSF** 09/14/88 LER# 44088035 50.72#: 13448 POWER: 100  
SYSTEM: PRIMARY CONTAINMENT/UNDETERMINED SYSTEM  
DESC: PRIMARY CONTAINMENT INTEGRITY WAS COMPROMISED. FAILURE OF DOOR INTERLOCK-FAILED MECHANICAL PUSH/PULL CABLE. ALSO PERSONNEL ERROR IN THAT OPERATOR ATTEMPTED TO OPEN INNER DOOR WHILE OUTER DOOR OPEN.
- SSF** 09/17/88 LER# 44088036 50.72#: POWER: 5  
SYSTEM: MAIN STEAM ISOLATION VALVES  
DESC: 2 OF 4 LOW MAIN CONDENSER PRESSURE TRANSMITTERS MALFUNCTIONED. CONDITION COULD HAVE PREVENTED TRIP OF THE MSIVS ON LOW CONDENSER VACUUM. DESIGNED TO PREVENT EXCESSIVE LOSS OF REACTOR COOLANT/RELEASE.

#### PI EVENTS FOR 88-4

- SSF** 10/07/88 LER# 44088040 50.72#: 13639 POWER: 100  
SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
DESC: BOTH TRAINS CONTROL ROOM CHILLERS WERE OUT OF SERVICE. COULD HAVE PREVENTED THE SYSTEM FROM MITIGATING THE CONSEQUENCES OF AN ACCIDENT. ONE TRAIN OUT FOR MAINT, OTHER BLOWN FUSE
- SSA** 10/30/88 LER# 44088043 50.72#: 13862 POWER: 0  
DESC: HPCS PUMP ROOM COOLER STARTED DURING HPCS PUMP BREAKER OPERATIONAL CHECK. HPCS PUMP DID NOT START DUE TO BREAKER BEING RACKED OUT.
- SSF** 11/21/88 LER# 44088045 50.72#: POWER: 100  
SYSTEM: STANDBY LIQUID CONTROL SYSTEM  
DESC: BOTH TRAINS OF THE STANDBY LIQUID CONTROL SYSTEM BECAME INOPERABLE WHEN THE CONCENTRATION OF SODIUM PENTABORATE SOLUTION EXCEEDED THE TECH. SPEC. LIMIT. CAUSED BY ABSENCE OF PROCEDURAL GUIDELINES.
- SSF** 12/01/88 LER# 44088046 50.72#: POWER: 100  
SYSTEM: SECONDARY CONTAINMENT/UNDETERMINED SYSTEM  
DESC: IN RESPONSE TO INFORMATION NOTICE 88-76, IT WAS IDENTIFIED THAT THE SECONDARY CONTAINMENT PRESSURE (ANNULUS) MAY NOT HAVE BEEN MAINTAINED AT A UNIFORM NEGATIVE PRESSURE RELATIVE TO OUTSIDE ATMOSPHERE.
- SSF** 12/08/88 LER# 44088047 50.72#: POWER: 100  
SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
DESC: WITH TRAIN 'B' OF THE CONTROL ROOM HVAC OUT OF SERVICE FOR MAINTENANCE, THE 'A' TRAIN WAS DECLARED INOPERABLE BECAUSE OF A FAILED FLOW SWITCH AND VALVE ACTUATOR.

#### PI EVENTS FOR 89-1

- SSF** 01/11/89 LER# 44089001 50.72#: 14469 POWER: 70  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: WITH DIV. I AND III DIESEL GENERATORS OUT OF SERVICE FOR MAINTENANCE, THE DIV. II EDG WAS DECLARED INOPERABLE WHEN FUEL OIL SAMPLE FAILED TO MEET SPECS. (FILTER PLUGGED UP). SHELF LIFE OF FUEL EXCEEDED.

TABLE 8.71 (CONT.)

PERRY (CONT.)

PI EVENTS FOR 89-1 (CONT.)

**SSF** 02/24/89 LER# 44089005 50.72#: 14849 POWER: 0  
 SYSTEM: PRIMARY CONTAINMENT/UNDETERMINED SYSTEM  
 DESC: WHILE REMOVING THE DRYWELL HEAD, ALL 144 DRYWELL NUTS WERE FOUND HAND TIGHT. NUTS WERE TORQUED ACCORDING TO VENDOR SUPPLIED VALUES, WHICH WERE TOO LOW. STRUCTURAL INTEGRITY & DRYWELL BYPASS LEAKAGE OF CONCERN.

**SSF** 02/24/89 LER# 44089006 50.72#: 14851 POWER: 0  
 SYSTEM: CONTAINMENT ISOLATION CONTROL SYSTEM  
 DESC: VARIOUS LLRT FAILURES (MAIN STEAM ISOLATION VALVES AND MAIN STEAM DRAIN VALVES) CONTAINMENT ISOLATION VALVES, TYPE B AND C LEAKAGE ALSO EXCEEDED. ALL MSLs EXCEEDED THEIR TS LIMITS. SAFETY CONCERN -PRIMARY CONTAINMENT INTEGRITY.

**SE** 02/28/89 LER# 44089010 50.72#: POWER: 0  
 DESC: TEMP IN EXCESS OF 330 DEGREES F WERE CALCULATED TO HAVE EXISTED IN THE UPPER PORTION OF THE DRYWELL. THE REGION INVOLVED CONTAINS APPROX 73 SAFETY-RELATED CABLES AND 35 SNUBBERS. EQ TEMP FOR THE CABLES IS 195 DEGREES F, FOR SNUBBERS 300 DEGREES F.

PI EVENTS FOR 89-2

**SSF** 04/11/89 LER# 50.72#: 15292 POWER: 0  
 SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
 DESC: BOTH A AND B TRAINS OF THE RHR SYSTEM WERE DECLARED INOPERABLE WHEN UNQUALIFIED KULKA TERMINAL BLOCKS WERE FOUND IN THE EMERGENCY SERVICE WATER INLET VALVES TO THE A AND B TRAIN RHR HEAT EXCHANGERS.

**SSF** 05/25/89 LER# 44089017 50.72#: 15711 POWER: 0  
 SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
 DESC: INOPERABILITY OF DIV. I AND II EMERGENCY DIESEL GENERATORS DUE TO A DESIGN DEFICIENCY IN THE GROUND FAULT DETECTION TRIP CIRCUIT. POTENTIAL FOR A TRIP OF EDG DURING A POSTULATED FIRE OR SEISMIC EVENT.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.29	.71	.00	3.92	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	1	1	0	0	0	0
TOTAL SCRAMS	1	1	1	7	0	0	0	0
SAFETY SYSTEM ACTUATIONS	1	1	0	1	0	1	0	0
SIGNIFICANT EVENTS	0	2	0	2	1	0	1	0
SAFETY SYSTEM FAILURES	8	5	1	2	4	4	3	2
FORCED OUTAGE RATE (%)	0	26	7	35	14	0	2	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	NA	3.70	1.31	1.96	1.02	.00	.80	.00
CRITICAL HOURS	773	1402	1526	1530	1953	1931	1255	0
COLLECTIVE RADIATION EXPOSURE	NA	NA	20	17	25	30	246	NA
CAUSE CODES:								
ADMINISTRATIVE	9	2	7	4	4	3	6	NA
LICENSED OPERATOR	3	3	1	3	1	0	1	NA
OTHER PERSONNEL	5	0	3	4	3	2	3	NA
MAINTENANCE	18	5	10	11	9	5	9	NA
A) MAINT PERSONNEL	3	0	3	0	2	2	5	NA
B) SURV AND TEST	12	2	5	3	3	1	4	NA
C) EQUIPMENT	6	2	2	7	3	3	1	NA
D) POTENTIAL MAINT	3	3	1	6	4	2	1	NA
DESIGN/INSTALLATION/FABRICATION	4	1	3	3	3	3	0	NA
EQUIPMENT FAILURE	1	0	0	0	0	1	0	NA



**TABLE 8.72**

**PILGRIM**

**PI EVENTS FOR 88-3**

**SSA** 07/11/88 LER# 29388020 50.72#: 12785 POWER: 0  
DESC: DEENERGIZED BUS BEFORE DISABLING DIESEL DUE TO SUPERVISOR NOT RECOGNIZING THAT DIESEL RUN/STOP SWITCH NOT INCLUDED IN TAGOUT CAUSING DIESEL START ON LOW VOLTS.

**SSF** 07/19/88 LER# 29388021 50.72#: 12890 POWER: 0  
SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
DESC: FOUR SOLENOID VALVES IN THE CONTROL ROOM ENVIRONMENTAL SYSTEM HAVE A MAXIMUM OPERATING PRESSURE LESS THAN MAX INST. AIR PRESSURE, CONDITION MAY MAKE THE SYSTEM INOPERABLE, INCORRECT DESIGN ASSUMPTION.

**PI EVENTS FOR 88-4**

**NONE**

**PI EVENTS FOR 89-1**

**SE** 01/10/89 LER# 50.72#: 14463 POWER: 0  
DESC: UPON LOSS OF AIR, THE AIR ACCUMULATORS, WHICH ARE UNDERSIZED, DEPLETES ITS AIR SUPPLY IN ABOUT 50 MIN. THIS WILL CAUSE ONE OF THE CONTAINMENT ISOLATION VALVES TO FAIL IN THE OPEN POSITION, THUS LOSING ONE OF THE CONTAINMENT ISOLATION BARRIERS.

**SSF** 02/16/89 LER# 29389008 50.72#: 14768 POWER: 3  
SYSTEM: PRIMARY CONTAINMENT/UNDETERMINED SYSTEM  
DESC: PRIMARY CONTAINMENT INTEGRITY WAS VIOLATED FOR APPROXIMATELY 5 SECONDS DUE TO IMPROPERLY ADJUSTED MECHANICAL INTERLOCKS OF THE INNER DRYWELL PERSONNEL AIRLOCK DOOR, ALLOWING BOTH HATCHES TO BE OPENED SIMULTANEOUSLY.

**SSA** 02/21/89 LER# 29389010 50.72#: 14809 POWER: 0  
DESC: LOST OFFSITE POWER TO STARTUP TRANSFORMER - DIESEL STARTED AND ASSUMED LOAD.

**SCRAM** 03/04/89 LER# 29389011 50.72#: 14930 POWER: 10  
DESC: HIGH VIBRATION ON TURBINE THRUST BEARINGS - TURBINE REMOVED FROM GRID & COASTING DOWN WHEN TURBINE BYPASS VALVE SHUT & THEN OPENED CAUSING MSIV TO SHUT ON LOW RX PRESSURE AND SCRAM ON MSIV <90% OPEN.

**SSF** 03/24/89 LER# 29389013 50.72#: 15120 POWER: 25  
SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
DESC: THE HPCI STEAM INLET VALVE WOULD NOT OPEN DURING A SURVEILLANCE TEST (VALVE CLOSED). LIMITORQUE VALVE TORQUE SWITCH SCREWS WERE FOUND LOOSE. DAMAGE TO VALVE OPERATOR INTERNALS AND MOTOR OPERATOR RESULTED. HPCI INOPERABLE.

**PI EVENTS FOR 89-2**

**SSF** 04/01/89 LER# 50.72#: 15183 POWER: 25  
SYSTEM: REACTOR BUILDING  
DESC: UNIT EXPERIENCED A LOSS OF SECONDARY CONTAINMENT INTEGRITY DUE TO BOTH INNER AND OUTER SECONDARY CONTAINMENT DOORS OPEN AT THE SAME TIME. DUE TO FAILED INTERLOCK.

**SE** 04/12/89 LER# 50.72#: 15310 POWER: 0  
DESC: AN RCIC INJECTION BLOCK VALVE WAS INADVERTANTLY OPENED DURING A TEST AND AN RCPB CHECK VALVE LEAKED FEEDWATER BACK THROUGH RCIC SUCTION PIPING AND OUT A RELIEF VALVE.

**SSF** 04/16/89 LER# 50.72#: 15354 POWER: 15  
SYSTEM: REACTOR CORE ISOLATION COOLING SYSTEM  
DESC: RCIC SYSTEM DECLARED INOPERABLE, NO OTHER INFORMATION IN RE.

TABLE 8.72 (CONT.)

PILGRIM (CONT.)

PI EVENTS FOR 89-2 (CONT.)

**SCRAM** 05/03/89 LER# 29389015 50.72#: 15514 POWER: 24  
 DESC: WHILE TROUBLESHOOTING THE FEEDWATER REGULATING VALVE, THE REACTOR WATER LEVEL INCREASED TO ITS TRIP SETPOINT CAUSING A TURBINE TRIP AND THEN A REACTOR TRIP.

**SSA** 05/20/89 LER# 29389017 50.72#: 15666 POWER: 0  
 DESC: LOW PRESSURE COOLANT INJECTION LOOP ACTIVATION DURING TESTING DUE TO AN ELECTRICAL ENGINEER NOT PLACING TAPE CORRECTLY ON RELAY CONTACTS TO PREVENT THE RELAY FROM ACTUATING.

**SSF** 05/20/89 LER# 50.72#: 15666 POWER: 0  
 SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
 DESC: SHUTDOWN COOLING WAS LOST FOR APPROXIMATELY 5 MINUTES WHEN DURING SURVEILLANCE WORK ON THE RECIRCULATION PUMP MOTOR GENERATOR SET BREAKERS A CONTACT BLOCK DISCONNECTED AND THE LPCI LOOP SELECT LOGIC WAS ACTIVATED RESULTING IN LOSS OF THE LPCI SYSTEM.

**SSA** 05/21/89 LER# 29389017 50.72#: 15669 POWER: 0  
 DESC: LPCI/RHR ACTUATION SIGNAL DURING TESTING DUE TO AN ELECTRICAL ENGINEER NOT PLACING HEAT SHRINK TUBING CORRECTLY ON RELAY CONTACTS TO PREVENT THE RELAY FROM ACTUATING.

**SSF** 06/09/89 LER# 50.72#: 15823 POWER: 25  
 SYSTEM: REACTOR CORE ISOLATION COOLING SYSTEM  
 DESC: RCIC SYSTEM DECLARED IMOPERABLE DURING SURVEILLANCE DUE TO A TEMPERATURE SWITCH FAILURE.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.79
SCRAMS < 15% POWER	0	0	0	0	0	0	1	0
TOTAL SCRAMS	0	0	0	0	0	0	1	1
SAFETY SYSTEM ACTUATIONS	0	1	0	0	1	0	1	2
SIGNIFICANT EVENTS	0	1	0	0	0	0	1	1
SAFETY SYSTEM FAILURES	1	1	1	0	1	0	2	4
FORCED OUTAGE RATE (%)	0	0	0	0	0	0	29	42
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.00
CRITICAL HOURS	0	0	0	0	0	0	969	1259
COLLECTIVE RADIATION EXPOSURE	603	281	163	57	96	75	49	NA
CAUSE CODES:								
ADMINISTRATIVE	2	3	5	2	3	3	5	NA
LICENSED OPERATOR	0	0	1	0	0	3	1	NA
OTHER PERSONNEL	1	4	2	3	0	0	5	NA
MAINTENANCE	4	7	7	5	3	4	9	NA
A) MAINT PERSONNEL	2	3	2	4	2	0	2	NA
B) SURV AND TEST	1	3	4	0	1	1	5	NA
C) EQUIPMENT	1	2	0	3	0	1	2	NA
D) POTENTIAL MAINT	0	1	1	1	0	2	1	NA
DESIGN/INSTALLATION/FABRICATION	0	4	3	1	1	1	4	NA
EQUIPMENT FAILURE	1	0	0	0	0	0	0	NA

**TABLE 8.73  
POINT BEACH 1**

**PI EVENTS FOR 88-3**

**SSF** 08/12/88 LER# 26688008 50.72#: POWER: 100  
SYSTEM: ENGINEERED SAFETY FEATURES ACTUATION SYSTEM  
DESC: CONTAINMENT DESIGN PRESSURE COULD BE EXCEEDED IN A POSTULATED MAIN STEAM LINE BREAK ACCIDENT ASSUMING A SINGLE FAILURE OF THE MAIN FEEDWATER REGULATING VALVE TO SHUT. ESF DESIGN ERROR

**SSF** 08/19/88 LER# 26688007 50.72#: POWER: 100  
SYSTEM: LOW PRESSURE SAFETY INJECTION SYSTEM  
DESC: ANALYSIS REVEALED DESIGN DEFICIENCY IN THE SAFETY INJECTION BLOCK CIRCUITRY THAT IT WOULD BE POSSIBLE FOR A FAILURE OF A SINGLE SWITCH TO RENDER BOTH TRAINS OF SI INOPERABLE.

**PI EVENTS FOR 88-4**

**SSF** 11/18/88 LER# 26688009 50.72#: POWER: 100  
SYSTEM: LOW PRESSURE SAFETY INJECTION SYSTEM  
DESC: PROCEDURE INADEQUACY COULD HAVE RESULTED IN SECURING ALL SAFEGUARDS PUMPS FOR A SHORT PERIOD OF TIME IN THE EVENT OF A LARGE BREAK LOCA.

**PI EVENTS FOR 89-1**

**SSF** 03/22/89 LER# 26689001 50.72#: 15091 POWER: 87  
SYSTEM: LOW PRESSURE SAFETY INJECTION SYSTEM  
DESC: BOTH TRAINS OF THE CORE SPRAY SYSTEM WERE RENDERED INOPERABLE BECAUSE THE B TRAIN DG WAS TAKEN OUT OF SERVICE FOR TESTING AND THE A TRAIN CORE SPRAY WAS TAKEN OUT OF SERVICE FOR A LEAK TEST. SYSTEM DID NOT MEET TECH. SPEC. OPERABILITY REQUIREMENTS.

**PI EVENTS FOR 89-2**

**SSF** 04/21/89 LER# 26689004 50.72#: POWER: 100  
SYSTEM: LOW PRESSURE SAFETY INJECTION SYSTEM  
DESC: NONCONSERVATIVE ANALYSIS OF TRANSFER TO CONTAINMENT SUMP RECIRCULATION SUCH THAT THE TIME ALLOWED BY PROCEDURE WAS EXCESSIVE. PROCEDURE ALLOWED SHORT DURATION SHUTDOWN OF ALL ECCS FLOW TO PERFORM TRANSFER, WHICH COULD UNCOVER THE CORE.

**SSF** 05/03/89 LER# 26689005 50.72#: POWER: 0  
SYSTEM: LOW TEMPERATURE/OVERPRESSURE SYSTEM  
DESC: THE OPENING TIMES FOR THE PORVS DURING A TEST OF THE LOW TEMP. OVERPRESSURE PROTECTION (LTOP) SYSTEM EXCEEDED THE TECH. SPEC. REQUIREMENTS. DETERMINED THAT THE SYSTEM WAS NOT DESIGNED TO OPERATE WITH N2 AS THE OPERATING GAS (BACKUP TO INSTRUMENT AIR)

**SSF** 06/25/89 LER# 50.72#: 15954 POWER: 100  
SYSTEM: ACCIDENT MONITORING SYSTEM  
DESC: AN INOPERATIVE BYSTABLE WAS DISCOVERED WHICH COULD HAVE PREVENTED OPERATION OF THE ATWS. CAUSED BY FAILED CONTACTS, BYSTABLE WAS REPLACED.

**TABLE 8.73 (CONT.)**  
**POINT BEACH 1 (CONT.)**

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.46	.00	.00	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	1	0	0	0	0	0	0
SAFETY SYSTEM ACTUATIONS	0	1	0	0	0	0	0	0
SIGNIFICANT EVENTS	0	0	0	1	0	0	0	0
SAFETY SYSTEM FAILURES	1	0	1	0	2	1	1	3
FORCED OUTAGE RATE (%)	0	1	0	0	0	0	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.46	.00	.00	.00	.00	.00	.00
CRITICAL HOURS	2208	2194	2184	1247	2208	2209	2160	1151
COLLECTIVE RADIATION EXPOSURE	8	164	11	74	11	98	9	NA
CAUSE CODES:								
ADMINISTRATIVE	0	0	1	1	1	2	1	NA
LICENSED OPERATOR	0	0	0	0	0	0	1	NA
OTHER PERSONNEL	0	0	0	0	1	0	1	NA
MAINTENANCE	0	1	1	1	1	1	1	NA
A) MAINT PERSONNEL	0	0	0	0	1	1	1	NA
B) SURV AND TEST	0	0	1	1	0	0	0	NA
C) EQUIPMENT	0	3	0	0	0	0	0	NA
D) POTENTIAL MAINT	0	1	0	0	0	0	0	NA
DESIGN/INSTALLATION/FABRICATION	0	0	2	1	2	0	1	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

**TABLE 8.74  
POINT BEACH 2**

**PI EVENTS FOR 88-3**

**SSF** 03/12/88 LER# 26688008 50.72#: POWER: 100  
 SYSTEM: ENGINEERED SAFETY FEATURES ACTUATION SYSTEM  
 DESC: CONTAINMENT DESIGN PRESSURE COULD BE EXCEEDED IN A POSTULATED MAIN STEAM LINE BREAK ACCIDENT ASSUMING A SINGLE FAILURE OF THE MAIN FEEDWATER REGULATING VALVE TO SHUT, ESF DESIGN ERROR

**SSF** 08/19/88 LER# 26688007 50.72#: POWER: 100  
 SYSTEM: LOW PRESSURE SAFETY INJECTION SYSTEM  
 DESC: ANALYSIS REVEALED DESIGN DEFICIENCY IN THE SAFETY INJECTION BLOCK CIRCUITRY THAT IT WOULD BE POSSIBLE FOR A FAILURE OF A SINGLE SWITCH TO RENDER BOTH TRAINS OF SI INOPERABLE.

**PI EVENTS FOR 88-4**

**SSF** 11/18/88 LER# 26688009 50.72#: POWER: 999  
 SYSTEM: LOW PRESSURE SAFETY INJECTION SYSTEM  
 DESC: PROCEDURE INADEQUACY COULD HAVE RESULTED IN SECURING ALL SAFEGUARDS PUMPS FOR A SHORT PERIOD OF TIME IN THE EVENT OF A LARGE BREAK LOCA.

**PI EVENTS FOR 89-1**

**SSA** 03/29/89 LER# 30189002 50.72#: 15148 POWER: 100  
 DESC: DIESEL STARTED ON UNDERVOLTAGE ON VITAL BUSES AFTER BREAKER ACTIONS IN SWITCHYARD REDUCED OFFSITE SERVICES FROM 4 TO 1 DUE TO DELUGE SYSTEM ACTUATING.

**SCRAM** 03/29/89 LER# 30189002 50.72#: 15148 POWER: 100  
 DESC: SCRAM ON TURBINE TRIP WHEN DELUGE SYSTEM ACTUATED DUE TO A FAILED BUSHING CAUSING GENERATOR LOCKOUT TURBINE TRIP.

**PI EVENTS FOR 89-2**

**SSF** 05/03/89 LER# 26689005 50.72#: POWER: 100  
 SYSTEM: LOW TEMPERATURE/OVERPRESSURE SYSTEM  
 DESC: THE OPENING TIMES FOR THE PORVS DURING A TEST OF THE LOW TEMP. OVERPRESSURE PROTECTION (LTOP) SYSTEM EXCEEDED THE TECH. SPEC. REQUIREMENTS. DETERMINED THAT THE SYSTEM WAS NOT DESIGNED TO OPERATE WITH N2 AS THE OPERATING GAS (BACKUP TO INSTRUMENT AIR)

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.46	.00	.00	.46	.00	.00	.47	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	1	0	0	1	0	0	1	0
SAFETY SYSTEM ACTUATIONS	0	0	0	2	0	0	1	0
SIGNIFICANT EVENTS	1	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	1	0	0	0	2	1	0	1
FORCED OUTAGE RATE (%)	2	0	0	1	0	0	3	2
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	.46	.00	.00	.47	.00
CRITICAL HOURS	2181	1137	2184	2164	2208	1152	2144	2183
COLLECTIVE RADIATION EXPOSURE	8	164	11	74	11	98	9	NA
CAUSE CODES:								
ADMINISTRATIVE	1	0	1	2	0	1	0	NA
LICENSED OPERATOR	1	1	0	1	0	1	0	NA
OTHER PERSONNEL	1	1	0	0	0	0	1	NA
MAINTENANCE	2	3	1	2	0	0	2	NA
A) MAINT PERSONNEL	1	1	0	1	0	0	1	NA
B) SURV AND TEST	1	0	1	1	0	0	0	NA
C) EQUIPMENT	1	1	0	0	0	0	0	NA
D) POTENTIAL MAINT	1	2	0	0	0	0	1	NA
DESIGN/INSTALLATION/FABRICATION	0	0	1	1	2	2	1	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

TABLE 8.75  
PRAIRIE ISLAND 1

PI EVENTS FOR 88-3

NONE

PI EVENTS FOR 88-4

NONE

PI EVENTS FOR 89-1

NONE

PI EVENTS FOR 89-2

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.45	.00	.00	.00	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	1	0	0	0	0	0	0	0
SAFETY SYSTEM ACTUATIONS	2	0	0	0	0	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	0	1	1	0	0	0	0	0
FORCED OUTAGE RATE (%)	0	0	0	0	3	0	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	.00	.75	.45	.00	.00
CRITICAL HOURS	2202	2209	2102	2183	1341	2209	2160	2183
COLLECTIVE RADIATION EXPOSURE	5	9	45	5	46	3	6	NA
CAUSE CODES:								
ADMINISTRATIVE	1	1	1	0	1	3	1	NA
LICENSED OPERATOR	1	0	0	1	0	1	0	NA
OTHER PERSONNEL	1	2	0	1	1	2	0	NA
MAINTENANCE	3	2	0	2	2	6	0	NA
A) MAINT PERSONNEL	0	1	0	1	1	0	0	NA
B) SURV AND TEST	2	1	0	0	1	3	0	NA
C) EQUIPMENT	0	0	0	1	0	3	0	NA
D) POTENTIAL MAINT	1	0	0	1	0	1	0	NA
DESIGN/INSTALLATION/FABRICATION	0	0	0	1	0	2	0	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

**TABLE 8.76**  
**PRAIRIE ISLAND 2**

**PI EVENTS FOR 88-3**

NONE

**PI EVENTS FOR 88-4**

**SSF** 12/08/88 LER# 30688002 50.72#: 14171 POWER: 100  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: WITH EMERGENCY DIESEL GENERATOR ID OUT OF SERVICE FOR MAINTENANCE, DIESEL GENERATOR D2'S OUTPUT BREAKER DID NOT CLOSE AS REQUIRED DURING TESTING. CAUSE SUSPECTED TO BE INTERNAL TO BREAKER.

**PI EVENTS FOR 89-1**

NONE

**PI EVENTS FOR 89-2**

**SCRAM** 05/26/89 LER# 30689002 50.72#: 15718 POWER: 100  
DESC: FAILED CAPACITOR IN TURBINE CONTROL SPEED ERROR CARD CAUSED TURBINE CONTROL VALVES TO CLOSE CAUSING LOW SG LEVEL SCRAM.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.66
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	0	0	0	0	1
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	0	1	1	0	0	1	0	0
FORCED OUTAGE RATE (%)	0	0	0	0	0	4	0	1
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.47	.00	.66
CRITICAL HOURS	2208	2209	1286	2183	2208	2137	2088	1521
COLLECTIVE RADIATION EXPOSURE	5	9	45	5	46	3	6	NA
CAUSE CODES:								
ADMINISTRATIVE	0	0	1	0	0	1	1	NA
LICENSED OPERATOR	0	0	0	1	1	0	0	NA
OTHER PERSONNEL	1	0	0	0	1	2	0	NA
MAINTENANCE	2	0	0	1	2	5	0	NA
A) MAINT PERSONNEL	0	0	0	0	1	0	0	NA
B) SURV AND TEST	1	0	0	0	1	2	0	NA
C) EQUIPMENT	0	0	0	1	0	2	0	NA
D) POTENTIAL MAINT	1	0	0	1	0	2	0	NA
DESIGN/INSTALLATION/FABRICATION	0	0	0	0	0	1	0	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	1	NA

**TABLE 8.77**  
**QUAD CITIES 1**

**PI EVENTS FOR 88-3**

**SSF** 08/22/88 LER# 25488013 50.72#: 13254 POWER: 60  
SYSTEM: REACTOR CORE ISOLATION COOLING SYSTEM  
DESC: 1A CORE SPRAY AND RCIC SYSTEMS DECLARED INOPERABLE DUE TO FAILED ROOM COOLER (BROKEN BELT), INSUFFICIENT PMS PROGRAM

**PI EVENTS FOR 88-4**

**SCRAM** 12/05/88 LER# 25488016 50.72#: 14157 POWER: 100  
DESC: SPURIOUS TURBINE TRIP CAUSED SCRAM.

**PI EVENTS FOR 89-1**

**SSF** 01/06/89 LER# 25489001 50.72#: 14431 POWER: 96  
SYSTEM: REACTOR CORE ISOLATION COOLING SYSTEM  
DESC: RCIC DECLARED INOPERABLE DUE TO A BROKEN TORQUE SWITCH ON A DISCHARGE VALVE. CAM ON THE TORQUE SWITCH ON THE VALVE OPERATOR WAS BINDING.

**PI EVENTS FOR 89-2**

**SE** 04/17/89 LER# 50.72#: 15358 POWER: 0  
DESC: DURING TESTING OF ELECTROMATIC RELIEF VALVE "D", THE VALVE FAILED TO CLOSE. OPERATORS MANUALLY SCRAMMED THE REACTOR PER PROCEDURES. REACTOR COOLDOWN RATE EXCEEDED TECH SPEC LIMIT OF 100 DEGREES F DURING THE FIRST TWO HOURS OF THE BLOWDOWN.

**SSF** 04/17/89 LER# 50.72#: 15365 POWER: 0  
SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
DESC: THE CONTROL ROOM EMERGENCY AIR FILTRATION SYSTEM (SINGLE TRAIN USED BY BOTH UNITS) WAS DECLARED INOPERABLE AFTER FAILING MONTHLY SURVEILLANCE TEST. LICENSEE IS INVESTIGATING CAUSE.

**SSF** 05/22/89 LER# 25489005 50.72#: 15680 POWER: 100  
SYSTEM: REACTOR CORE ISOLATION COOLING SYSTEM  
DESC: RCIC DECLARED INOPERABLE. ONE OF TWO HIGH FLOW ISOLATION SWITCHES WOULD NOT TRIP DUE TO A STRIPPED LOCKING SCREW WHICH ALLOWED THE INSTRUMENT TO DRIFT.

**SCRAM** 06/29/89 LER# 50.72#: 15994 POWER: 94  
DESC: LOOSE CONNECTION TO A LIGHT SOCKET FOR A LOW VACUUM SWITCH IN THE TURBINE CONTROL PANEL CAUSED A TURBINE TRIP SCRAM.

	TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000	CRITICAL HOURS	.00	.00	.00	.00	.00	.46	.00	.51
	SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
	TOTAL SCRAMS	0	0	0	0	0	1	0	1
	SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	0	0
	SIGNIFICANT EVENTS	0	0	0	0	0	0	0	1
	SAFETY SYSTEM FAILURES	2	3	1	2	1	0	1	2
	FORCED OUTAGE RATE (%)	0	13	0	14	0	4	0	13
EQUIP. FORCED OUTAGES/1000	CRITICAL HOURS	.00	9.17	.46	2.07	.00	.46	.00	2.03
	CRITICAL HOURS	1753	218	2184	1934	2208	2152	2160	1967
	COLLECTIVE RADIATION EXPOSURE	53	197	55	286	38	36	39	NA
CAUSE CODES:									
	ADMINISTRATIVE	1	3	5	1	2	1	1	NA
	LICENSED OPERATOR	0	1	0	1	1	0	0	NA
	OTHER PERSONNEL	1	5	0	1	2	0	0	NA
	MAINTENANCE	6	9	5	2	3	2	2	NA
	A) MAINT PERSONNEL	0	4	2	2	2	0	0	NA
	B) SURV AND TEST	1	0	3	0	1	1	1	NA
	C) EQUIPMENT	4	5	0	0	0	0	1	NA
	D) POTENTIAL MAINT	5	3	0	0	0	1	1	NA
	DESIGN/INSTALLATION/FABRICATION	0	5	1	3	0	0	0	NA
	EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA



**TABLE 8.78**  
**QUAD CITIES 2**

**PI EVENTS FOR 88-3**

NONE

**PI EVENTS FOR 88-4**

**SSA** 11/14/88 LER# 26585027 50.72#: 13989 POWER: 98  
DESC: TECH SHORTED ACROSS LEADS CAUSING HPCI START - OPERATOR SECURED FLOW BEFORE INJECTION OCCURRED.

**PI EVENTS FOR 89-1**

NONE

**PI EVENTS FOR 89-2**

**SCRAM** 04/06/89 LER# 26589001 50.72#: 15225 POWER: 80  
DESC: THE MAIN TURBINE TRIPPED DURING SURVEILLANCE TESTING RESULTING IN A REACTOR TRIP.

**SSF** 04/17/89 LER# 26589002 50.72#: 15365 POWER: 88  
SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
DESC: THE CONTROL ROOM EMERGENCY AIR FILTRATION SYSTEM (SINGLE TRAIN USED BY BOTH UNITS) WAS DECLARED INOPERABLE AFTER FAILING MONTHLY SURVEILLANCE TEST. LICENSEE IS INVESTIGATING CAUSE.

**SSF** 05/29/89 LER# 26589003 50.72#: 15400 POWER: 98  
SYSTEM: REACTOR BUILDING  
DESC: LOSS OF SECONDARY CONTAINMENT DURING SEARCH FOR GROUNDS ON 125V DC. A BREAKER WAS CYCLED AND THE DOORS BETWEEN THE TURBINE BUILDING AND THE REACTOR BUILDING LATER (4.75 HOURS ) FOUND OPEN. POSSIBLE DESIGN ERROR IN INTERLOCKS.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.47	1.77	.97	.00	.00	.00	.00	.47
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	2	2	2	0	0	0	0	1
SAFETY SYSTEM ACTUATIONS	0	3	0	1	0	1	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	1	1	2	3	0	0	0	2
FORCED OUTAGE RATE (%)	39	17	7	0	24	1	3	4
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.74	.54	.97	.00	.59	.00	.48	1.41
CRITICAL HOURS	1360	1866	2061	380	1708	2144	2103	2124
COLLECTIVE RADIATION EXPOSURE	53	197	55	286	38	36	39	NA
CAUSE CODES:								
ADMINISTRATIVE	1	4	6	7	3	6	0	NA
LICENSED OPERATOR	0	0	0	0	1	0	0	NA
OTHER PERSONNEL	1	6	0	2	2	4	0	NA
MAINTENANCE	4	11	9	11	3	6	0	NA
A) MAINT PERSONNEL	0	4	4	5	2	2	0	NA
B) SURV AND TEST	1	1	2	2	1	5	0	NA
C) EQUIPMENT	2	4	2	5	0	1	0	NA
D) POTENTIAL MAINT	3	5	3	4	1	1	0	NA
DESIGN/INSTALLATION/FABRICATION	0	4	1	8	0	0	0	NA
EQUIPMENT FAILURE	0	0	1	1	0	0	0	NA

TABLE 8.79  
RANCHO SECO

PI EVENTS FOR 88-3

NONE

PI EVENTS FOR 88-4

**SCRAM** 10/14/88 LER# 31288015 50.72#: 13709 POWER: 92  
DESC: POWER IMBALANCE CAUSED LOSS OF THE 6.9KV BUSES. ALL RCPS TRIPPED CAUSING A REACTOR SCRAM.

**SSA** 12/09/88 LER# 31288018 50.72#: 14199 POWER: 60  
DESC: 'B' HPI PUMP INJECTED THROUGH FOUR HPI NOZZLES TO MAINTAIN RCS PRESSURE AND PZR LEVEL CONTROL AFTER THE SCRAM.

**SCRAM** 12/09/88 LER# 31288018 50.72#: 14199 POWER: 60  
DESC: A FAILURE IN THE INTEGRATED CONTROL SYSTEM CAUSED MAIN FEEDWATER OSCILLATIONS AFTER TAKING CONTROL FROM MANUAL TO AUTO FOLLOWING CALIBRATION LEAD TO HIGH REACTOR COOLANT PRESSURE AND A SUBSEQUENT REACTOR TRIP.

PI EVENTS FOR 89-1

**SSF** 01/12/89 LER# 31289003 50.72#: POWER: 92  
SYSTEM: CONTAINMENT ISOLATION CONTROL SYSTEM  
DESC: AS A RESULT OF A NOTICE FROM LIMITORQUE CORP., 5 CONTAIN. ISOL. VALVES WERE FOUND TO HAVE TORQUE SWITCH CONTACT CASING DESIGN DEFICIENCIES AND 3 CONTAINMENT ISOLATION VALVES DID NOT MEET EQ RQMTS DUE TO INADEQUATE VENDOR QUALIFICATION.

**SE** 01/30/89 LER# 31289001 50.72#: 14610 POWER: 92  
DESC: AUXILIARY FEEDWATER SYSTEM OVERPRESSURIZATION DUE TO TURBINE/PUMP OVERSPEED.

**SSF** 01/31/89 LER# 31289001 50.72#: 14610 POWER: 93  
SYSTEM: AUXILIARY/EMERGENCY FEEDWATER SYSTEM  
DESC: AFW SYSTEM DECLARED INOPERABLE. TURBINE DRIVEN AFW UNDERGOING A MAINTENANCE RUN WHEN IT DID NOT TRIP ON OVERSPEED. DISCHARGE PRESSURE DURING THE TRANSIENT CALCULATED TO BE 3800 PSIG - PIPE DESIGN IS 1325 PSIG.

**SE** 02/14/89 LER# 50.72#: 14755 POWER: 0  
DESC: REACTOR COOLANT PUMP SEAL INJECTION LINE CHECK VALVE INOPERABLE.

**SSF** 02/18/89 LER# 31289005 50.72#: POWER: 0  
SYSTEM: AUXILIARY/EMERGENCY FEEDWATER SYSTEM  
DESC: SIX AUX. FEEDWATER SYSTEM ESSENTIAL FLOW TRANSMITTERS HAD PLASTIC PLUGS INSTALLED IN THE SPARE CONDUIT CONNECTION OPENING. (DID NOT MEET EQ REQUIREMENTS). ERRONEOUS INDICATION MAY BE RECEIVED DURING DBA.

**SSF** 02/28/89 LER# 31289002 50.72#: 14880 POWER: 0  
SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
DESC: DHR CAPABILITY LOST FOR APPROXIMATELY 10 MINS WHEN THE COMMON SUCTION VALVE FOR THE TWO TRAINS CLOSED. CAUSED BY RCS PRESSURE NEAR SETPOINT OF ISOLATION PRESSURE SWITCH. CONTRIBUTING TO THIS CAUSE IS THE SETPOINT WAS LOW.

**SSA** 03/28/89 LER# 31289004 50.72#: 15145 POWER: 84  
DESC: HPI 'A' AND 'B' STARTED MANUALLY AND HPI 'A' VALVE OPENED TO RESTORE PZR LEVEL AFTER THE SCRAM.

**SCRAM** 03/28/89 LER# 31289004 50.72#: 15145 POWER: 84  
DESC: UNKNOWN CAUSE FOR MFW INSTABILITY AND SPEED REDUCTION CAUSED LOW SG INVENTORY AND SUBSEQUENT HIGH REACTOR PRESSURE SCRAM.

TABLE 8.79 (CONT.)  
RANCHO SECO (CONT.)

PI EVENTS FOR 89-2  
NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.51	.00	1.30	1.11	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	1	0	2	1	0
SAFETY SYSTEM ACTUATIONS	0	0	1	1	0	1	1	0
SIGNIFICANT EVENTS	0	0	1	0	0	0	2	0
SAFETY SYSTEM FAILURES	3	2	0	1	0	0	4	0
FORCED OUTAGE RATE (%)	100	100	100	0	0	32	64	9
EQUIP. FORCED OUTAGE <sub>2</sub> /1000 CRITICAL HOURS	.00	.00	.00	.00	.00	2.59	3.32	.00
CRITICAL HOURS	0	0	4	1970	2029	1542	903	1452
COLLECTIVE RADIATION EXPOSURE	75	68	29	12	22	19	27	NA
CAUSE CODES:								
ADMINISTRATIVE	5	2	2	4	2	3	1	NA
LICENSED OPERATOR	0	2	1	1	1	1	2	NA
OTHER PERSONNEL	1	1	3	0	4	2	2	NA
MAINTENANCE	5	4	4	2	2	6	3	NA
A) MAINT PERSONNEL	1	0	0	1	1	2	1	NA
B) SURV AND TEST	3	4	4	1	1	2	0	NA
C) EQUIPMENT	1	0	1	0	0	1	2	NA
D) POTENTIAL MAINT	2	0	0	1	0	2	1	NA
DESIGN/INSTALLATION/FABRICATION	1	2	1	3	1	1	2	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

## TABLE 8.80

### RIVER BEND

#### PI EVENTS FOR 88-3

- SSA** 08/25/88 LER# 45888018 50.72#: 13285 POWER: 100  
DESC: HPCS AND RCIC STARTED ON SCRAM AND INJECTED FOR ABOUT 1 MINUTE. HPCS DG STARTED DUE TO LOW VOLTS ON 1E22 \* S004 BUS.
- SE** 08/25/88 LER# 45888018 50.72#: 13202 POWER: 0  
DESC: PLANT TRIP ON GENERATOR BRUSH FAILURE WITH FAILURE OF DIVISION #11 4160 VAC A/D BACK LEAKAGE THROUGH HPCS INJECTION AND CHECK VALVES. INFORMATION CONCERNING EVENT INCLUDED IN RE (50.72) 13285 AND 13292.
- SCRAM** 08/25/88 LER# 45888018 50.72#: 13285 POWER: 100  
DESC: GENERATOR TRIPPED DUE TO DETERIORATED EXCITER BRUSHES CAUSING A TURBINE TRIP AND A REACTOR TRIP.
- SSA** 09/06/88 LER# 45888021 50.72#: 13392 POWER: 100  
DESC: SPURIOUS LOW-LOW REACTOR LEVEL DUE TO TURBINE TRIP AND FAST RESPONSE OF LEVEL TRANSMITTERS. HPCS AND RCIC STARTED ON SPURIOUS LOW REACTOR LEVEL.
- SCRAM** 09/06/88 LER# 45888021 50.72#: 13392 POWER: 100  
DESC: A CAT CRAWLED ON GROUNDING TRANSFORMER CAUSING A SHORT CIRCUIT RESULTING IN A GENERATOR TRIP, TURBINE TRIP, AND A REACTOR TRIP.

#### PI EVENTS FOR 88-4

- SSF** 12/19/88 LER# 45888027 50.72#: POWER: 95  
SYSTEM: REACTOR CORE ISOLATION COOLING SYSTEM  
DESC: DURING A DESIGN REVIEW, DISCOVERED THAT THE RCIC TURBINE HAD NOT BEEN INSTALLED AS DESIGNED (SEISMIC SUPPORT). RCIC DECLARED INOPERABLE, CONDITION WAS CORRECTED.

#### PI EVENTS FOR 89-1

- SCRAM** 02/20/89 LER# 45889007 50.72#: 14802 POWER: 2  
DESC: DURING STARTUP, MAIN STEAMLINE DRAINS WERE BEING OPENED NUMEROUS AIR LEAKS IN THE FEEDWATER REGULATING VALVE OPERATOR CAUSED SLUGGISH RESPONSE. MFW FED COLD WATER CAUSING A REACTIVITY ADDITION RESULTING IN AN IRM SCRAM.
- SCRAM** 02/25/89 LER# 45889008 50.72#: 14854 POWER: 78  
DESC: DURING TURBINE BEARING WEAR DETECTOR TESTING THE TRIP BYPASS RELAY FAILED TO OPEN THE TURBINE TRIP CIRCUIT. THIS CAUSED A TURBINE TRIP AND A SUBSEQUENT REACTOR TRIP.
- SSF** 03/21/89 LER# 45889011 50.72#: POWER: 0  
SYSTEM: SECONDARY CONTAINMENT/UNDETERMINED SYSTEM  
DESC: THE REACTOR CONTAINMENT BUILDING INTEGRATED LEAK RATE WAS IN EXCESS OF T.S. REQUIREMENTS DUE TO LEAKAGE THROUGH ESW PENETRATIONS. THE MOTOR OPERATED GATE VALVES AND SWING CHECK VALVES, COULD NOT SEAL DUE TO BUILDUP OF CORROSION PRODUCTS ON SEALS.

#### PI EVENTS FOR 89-2

- SSF** 04/10/89 LER# 45889024 50.72#: 15648 POWER: 0  
SYSTEM: ESSENTIAL AIR SYSTEM  
DESC: SOLENOID VALVES ASSOCIATED WITH THE ESSENTIAL AIR SYSTEM ACCUMULATORS WERE NOT ORIENTATED CORRECTLY. AIR PRESSURE IN THE ACCUMULATORS COULD NOT BE MAINTAINED AS WAS DEMONSTRATED BY TESTING.
- SE** 04/20/89 LER# 50.72#: 15384 POWER: 0  
DESC: FREEZE PLUG IN SERVICE WATER PIPE FAILED CAUSING FLOODING AND LOSS OF POWER TO RHR, SPENT FUEL POOL, AND OTHER EQUIPMENT.

TABLE 8.80 (CONT.)

RIVER BEND (CONT.)

PI EVENTS FOR 89-2 (CONT.)

SSA 05/28/89 LER# 45889027 50.72#: 15735 POWER: 0  
 DESC: WHEN PLACING REMOTE TRANSFER SWITCH TO NORMAL, GOT HPCS START SIGNAL, HPCS BREAKER RACKED OUT, HPCS DIESEL STARTED.

SSA 06/13/89 LER# 45889029 50.72#: 15855 POWER: 0  
 DESC: POWER LOST TO PREFERRED TRANSFORMER THAT FEEDS DIVISION 2 SWITCHGEAR, DIVISION 2 DIESEL STARTED AND LOADED BUS.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.99	.00	.95	.00	.60	.00
SCRAMS < 15% POWER	0	1	1	0	0	0	1	0
TOTAL SCRAMS	0	1	3	0	2	0	2	0
SAFETY SYSTEM ACTUATIONS	0	0	1	0	2	0	0	2
SIGNIFICANT EVENTS	1	0	0	0	1	0	0	1
SAFETY SYSTEM FAILURES	2	1	0	0	0	1	1	1
FORCED OUTAGE RATE (%)	3	54	9	0	6	2	9	77
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.57	9.30	.99	.00	.48	.51	1.81	14.42
CRITICAL HOURS	1763	215	2017	2183	2104	1976	1656	208
COLLECTIVE RADIATION EXPOSURE	59	280	17	21	20	42	105	NA
CAUSE CODES:								
ADMINISTRATIVE	2	7	5	0	3	3	3	NA
LICENSED OPERATOR	0	0	2	0	1	1	1	NA
OTHER PERSONNEL	1	3	0	2	2	1	5	NA
MAINTENANCE	4	9	7	2	8	5	13	NA
A) MAINT PERSONNEL	1	0	0	0	3	0	3	NA
B) SURV AND TEST	2	6	4	1	1	2	5	NA
C) EQUIPMENT	1	1	1	1	1	3	3	NA
D) POTENTIAL MAINT	1	3	3	0	4	1	2	NA
DESIGN/INSTALLATION/FABRICATION	0	2	2	1	0	2	2	NA
EQUIPMENT FAILURE	1	1	0	0	0	0	0	NA

**TABLE 8.81****ROBINSON 2****PI EVENTS FOR 88-3**

**SSF** 09/05/88 LER# 26188019 50.72#: 13387 POWER: 0  
SYSTEM: CONTAINMENT FAN COOLING SYSTEM  
DESC: AT LEAST 3/4 CONTAINMENT FAN COOLERS INOPERABLE (T.S REQUIRES AT LEAST 2 OPERABLE). TUBES HAVE EXPERIENCED > 20% REDUCTION IN DIAMETER DUE TO FOULING.

**SSF** 09/21/88 LER# 26188021 50.72#: 13513 POWER: 89  
SYSTEM: SECONDARY CONTAINMENT/UNDETERMINED SYSTEM  
DESC: LOSS OF CONTAINMENT VESSEL INTEGRITY. LEAKING CONTAINMENT PURGE VALVES CAUSED BY DEBRIS ( AS A RESULT OF CLEANING) ENETERED.

**PI EVENTS FOR 88-4**

**SSF** 10/27/88 LER# 26188024 50.72#: 13837 POWER: 100  
SYSTEM: CONTAINMENT FAN COOLING SYSTEM  
DESC: ALL 4 CONTAINMENT HVAC UNITS DECLARED INOPERABLE AFTER LICENSEE INSPECTION DETERMINED THAT THE SPLICES IN THE 480 VOLT POWER SUPPLIES TO UNITS WERE NOT ENVIR. QUALIFIED TO WITHSTAND LOCA CONDITIONS.

**SSF** 11/21/88 LER# 26188028 50.72#: POWER: 999  
SYSTEM: CONTAINMENT COMBUSTIBLE GAS CONTROL SYSTEM  
DESC: REVIEW OF THE HYDROGEN RECOMBINER SYSTEM, IT WAS DISCOVERED THAT SYSTEM OPERATION REQUIRES ACCESS TO 11 LOCKED CLOSED VALVES LOCATED IN A RADIOLOGICALLY HARSH ENVIRONMENT DURING POST-LOCA CONDITIONS

**PI EVENTS FOR 89-1**

**SE** 01/07/89 LER# 50.72#: 14435 POWER: 0  
DESC: HYDROGEN FROM MAIN GENERATOR COOLING SYSTEM WAS INTRODUCED TO PLANT AND INSTRUMENT AIR SYSTEMS THROUGH PERSONNEL ERROR.

**SSA** 02/27/89 LER# 26189004 50.72#: 14874 POWER: 30  
DESC: A SHORT CIRCUIT INDUCED BY A TECHNICIAN CAUSED THE GOVERNOR VALVES TO CLOSE. WHEN THE SHORT WAS REMOVED, THE STEAM DUMP OPENED LEADING TO A HIGH STEAM FLOW/LOW STEAMLINE PRESSURE/LOW RCS TEMPERATURE AND A SAFETY INJECTION.

**SCRAM** 02/27/89 LER# 26189004 50.72#: 14874 POWER: 30  
DESC: A SAFETY INJECTION ON HIGH STEAM FLOW/LOW STEAMLINE PRESSURE/LOW RCS TEMPERATURE CAUSED A REACTOR TRIP.

**SCRAM** 03/22/89 LER# 26189005 50.72#: 15086 POWER: 100  
DESC: OPERATOR INADVERTENTLY SHUT MSIV INSTEAD OF STEAM SUPPLY TO THE AFW PUMP CAUSING A LOW SG LEVEL SCRAM.

**SCRAM** 03/30/89 LER# 26189006 50.72#: 15161 POWER: 100  
DESC: LOSS OF POWER TO THE EHC SYSTEM CAUSED TURBINE TRIP SCRAM DUE TO A HARDWARE AND SETPOINT PROBLEMS.

**PI EVENTS FOR 89-2**

**SSF** 04/10/89 LER# 26189008 50.72#: POWER: 0  
SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
DESC: AN INTERNAL SSFI TEAM FIELD VALIDATION OF THE DESIGN BASIS DOCUMENT FOR THE SAFETY INJ SYSTEM FOUND THAT A NON-SAFETY PENETRATION CROSS-CONNECTED THE RHR PUMP BAYS WHICH MAY ALLOW POST-LOCA FLOODING OF BOTH BAYS RENDERING BOTH TRAINS INOPERABLE.

TABLE 8.81 (CONT.)

ROBINSON 2 (CONT.)

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.71	.00	.86	.99	.00	.00	3.38	.00
SCRAMS < 15% POWER	1	0	0	0	0	0	0	0
TOTAL SCRAMS	4	0	1	2	0	0	3	0
SAFETY SYSTEM ACTUATIONS	0	0	1	0	0	0	1	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	1	0
SAFETY SYSTEM FAILURES	4	5	1	1	2	2	0	1
FORCED OUTAGE RATE (%)	23	1	47	8	23	14	7	14
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	4.00	.00	.84	.99	1.17	2.29	1.13	.53
CRITICAL HOURS	1750	2209	1189	2016	1714	873	808	1886
COLLECTIVE RADIATION EXPOSURE	36	20	69	22	34	441	117	NA
CAUSE CODES:								
ADMINISTRATIVE	2	1	2	3	4	2	2	NA
LICENSED OPERATOR	0	0	0	0	0	0	1	NA
OTHER PERSONNEL	1	1	0	0	1	0	2	NA
MAINTENANCE	5	3	3	5	3	2	4	NA
A) MAINT PERSONNEL	0	1	1	0	3	1	1	NA
B) SURV AND TEST	3	0	1	2	0	0	2	NA
C) EQUIPMENT	2	2	1	4	0	1	1	NA
D) POTENTIAL MAINT	2	1	1	4	0	1	0	NA
DESIGN/INSTALLATION/FABRICATION	2	4	3	2	2	4	1	NA
EQUIPMENT FAILURE	0	0	0	1	0	0	1	NA

TABLE 8.82

SALEM 1

PI EVENTS FOR 88-3

**SCRAM** 08/31/88 LER# 27288015 50.72#: 13329 POWER: 100  
DESC: TURBINE TRIP CAUSED A REACTOR TRIP DUE TO A CLOGGED ORIFICE REDUCING OIL TO TRIP MECHANISM.

PI EVENTS FOR 88-4

**SSF** 11/17/88 LER# 27288020 50.72#: POWER: 100  
SYSTEM: RADIATION MONITORING SYSTEM  
DESC: SEVERAL OF THE RMS CHANNELS USED TO ISOLATE THE CONTAINMENT PRESSURE/PURGE - VACUUM RELIEF SYSTEM WERE SET SUCH THAT SIGNIFICANTLY HIGHER LEVELS OF ACTIVITY WOULD HAVE BEEN REQUIRED FOR AUTO ISOLATION

PI EVENTS FOR 89-1

**SSF** 01/27/89 LER# 27289005 50.72#: POWER: 100  
SYSTEM: LOW PRESSURE SAFETY INJECTION SYSTEM  
DESC: BOTH ECCS TRAINS WERE DECLARED INOPERABLE WHEN ONE TRAIN WAS PLACED OUT OF SERVICE FOR MAINTENANCE AND THE EDG THAT SUPPLIES THE OTHER TRAIN WAS MADE INOPERABLE DUE TO AN EQUIPMENT FAILURE. LPSI INOPERABLE.

**SCRAM** 02/06/89 LER# 27289007 50.72#: 14664 POWER: 100  
DESC: TESTING SG PRESSURE CHANNEL AND RECEIVED SF/FF MISMATCH - LOW SG LEVEL SIGNAL SCRAM DUE TO OPERATOR NOT SELECTING CORRECT CHANNEL.

**SSA** 02/07/89 LER# 27289008 50.72#: 14675 POWER: 0  
DESC: OPERATOR FAILED TO BYPASS UNDERVOLTAGE RELAYS PRIOR TO STARTING RCP CAUSING '1C' VITAL BUS TO UNLOAD AND DIESEL TO START.

**SSF** 02/09/89 LER# 27289010 50.72#: POWER: 100  
SYSTEM: RADIATION MONITORING SYSTEM  
DESC: CONTAINMENT PARTICULATE RADIATION MONITORING SYSTEM AIR SAMPLE PUMP SEIZED. RESULTED IN RM CHANNELS (ESF) INOPERABLE WHICH PROVIDE THE CONTAINMENT PURGE/PRESSURE-VACUUM RELIEF SYSTEM.

**SCRAM** 02/18/89 LER# 27289012 50.72#: 14794 POWER: 0  
DESC: MISUNDERSTANDING PROCEDURE CAUSED TWO TESTS AT ONCE TO ALLOW SENSED POWER TO EXCEED 10% ALLOWING FOR A TURBINE TRIP SIGNAL TO BE GENERATED CAUSING A SCRAM.

PI EVENTS FOR 89-2

**SSF** 05/02/89 LER# 27289018 50.72#: POWER: 0  
SYSTEM: SOLID STATE CONTROL SYSTEM/AUXILIARY LOGIC CONTROL SYSTEM  
DESC: AN INSPECTION REVEALED INADEQUATE CONNECTIONS IN BOTH CABINETS OF THE SOLID STATE PROTECTION SYSTEM. CAUSE ATTRIBUTED TO INITIAL FABRICATION PERFORMED BY THE VENDOR. THE FAILURE OF THESE CONNECTIONS COULD PREVENT AUTO REACTOR TRIP OR ESF FUNCTIONS.

**SE** 05/20/89 LER# 27289019 50.72#: 15675 POWER: 0  
DESC: LOSS OF RHR FROM INADVERTENT ACCUMULATOR NITROGEN DISCHARGE.

**SSF** 05/20/89 LER# 27289019 50.72#: 15675 POWER: 0  
SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
DESC: LOSS OF RHR SYSTEM DUE TO GAS BINDING OF PUMPS DURING TESTING. N2 GAS ENTERED THE RCS DURING ACCUMULATOR DISCHARGE CHECK VALVE TESTING. PERSONNEL DID NOT COMPLY WITH SPECIFIC REQUIREMENTS OF THE PROCEDURE.

**SSA** 06/09/89 LER# 27289024 50.72#: 15831 POWER: 0  
DESC: A S1 OCCURRED WHEN A MAIN STEAMLINE SAFETY POPPED OPEN CAUSING S1 ON HIGH STEAMLINE DIFFERENTIAL PRESSURE DUE TO INADEQUATE PROCEDURES OR A FAILURE TO COMPLY WITH STATION ADMINISTRATIVE PROCEDURES.



TABLE 8.82 (CONT.)

SALEM 1 (CONT.)

PI EVENTS FOR 89-2 (CONT.)

SCRAM 06/19/89 LER# 27289027 50.72#; 15910 POWER: 45  
 DESC: POSSIBLE DESIGN PROBLEM WITH MSIV TESTING CIRCUIT CAUSED MSIV CLOSURE WHEN TESTING MSIV'S CAUSING A  
 LOW SG LEVEL SCRAM WHEN THE MSIV'S SHUT.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.49	.00	.54	4.48
SCRAMS < 15% POWER	0	0	1	0	0	0	1	0
TOTAL SCRAMS	0	0	1	0	1	0	2	1
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	1	1
SIGNIFICANT EVENTS	0	1	0	0	0	0	0	1
SAFETY SYSTEM FAILURES	2	2	1	1	0	1	2	2
FORCED OUTAGE RATE (%)	0	0	5	0	8	0	12	71
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	3.53	.54	.49	.00	1.07	8.97
CRITICAL HOURS	2208	46	849	1839	2040	2209	1862	223
COLLECTIVE RADIATION EXPOSURE	20	263	44	15	109	92	9	NA
CAUSE CODES:								
ADMINISTRATIVE	1	5	4	1	5	1	4	NA
LICENSED OPERATOR	0	1	0	0	0	0	2	NA
OTHER PERSONNEL	0	2	4	0	1	0	5	NA
MAINTENANCE	1	5	5	1	5	2	9	NA
A) MAINT PERSONNEL	1	2	0	0	0	0	5	NA
B) SURV AND TEST	0	3	4	1	3	0	4	NA
C) EQUIPMENT	0	0	2	0	1	2	2	NA
D) POTENTIAL MAINT	1	0	0	0	1	1	0	NA
DESIGN/INSTALLATION/FABRICATION	0	4	5	2	3	0	1	NA
EQUIPMENT FAILURE	0	0	0	0	0	1	1	NA

TABLE 8.83

SALEM 2

PI EVENTS FOR 88-3

**SSF** 07/26/88 LER# 31188015 50.72#: POWER: 97  
SYSTEM: HIGH PRESSURE SAFETY INJECTION SYSTEM  
DESC: WITH ONE COOLANT CHARGING PUMP OUT OF SERVICE FOR A MODIFICATION, THE REDUNDANT TRAIN HEAT EXCHANGER WAS MADE INOPERABLE DUE TO LEAKAGE, THUS MAKING REDUNDANT PUMP INOP. CCPS PERFORM NPSI FUNCTION.

**SCRAM** 07/30/88 LER# 31188016 50.72#: 13044 POWER: 80  
DESC: THE REACTOR TRIPPED WHILE REDUCING POWER DUE TO PROBLEMS ASSOCIATED WITH "C" VITAL BUS INVERTER.

**SCRAM** 08/31/88 LER# 31188017 50.72#: 13330 POWER: 71  
DESC: VIBRATION CAUSED THE FEEDWATER REGULATING VALVE POSITIONER LINKAGE TO DISCONNECT CAUSING THE VALVE TO FAIL OPEN RESULTING IN A HIGH SG LEVEL AND A REACTOR TRIP.

**SSF** 09/12/88 LER# 31188023 50.72#: POWER: 0  
SYSTEM: RADIATION MONITORING SYSTEM  
DESC: LOW CALIBRATION SETTING OF RMS MONITORS - INADEQUATE ADMINISTRATIVE CONTROLS.

PI EVENTS FOR 88-4

**SSF** 11/14/88 LER# 31188023 50.72#: POWER: 0  
SYSTEM: RADIATION MONITORING SYSTEM  
DESC: SEVERAL OF THE RMS CHANNELS USED TO ISOLATE THE CONTAINMENT PRESSURE/PURGE - VACUUM RELIEF SYSTEM WERE SET SUCH THAT SIGNIFICANTLY HIGHER LEVELS OF ACTIVITY WOULD HAVE BEEN REQUIRED FOR AUTO ISOLATION

**SCRAM** 11/28/88 LER# 31188024 50.72#: 14098 POWER: 24  
DESC: AN INADEQUATE PROCEDURE THAT SPECIFIED AN IMPROPER SETPOINT CAUSED POOR FEEDWATER REGULATING VALVE RESPONSE AND LEAD TO A HIGH SG LEVEL, A MFP TRIP, A LOW SG LEVEL, AND THEN A REACTOR TRIP.

PI EVENTS FOR 89-1

**SCRAM** 02/05/89 LER# 31189003 50.72#: 14654 POWER: 100  
DESC: MFP TRIPPED CAUSING LOW SG LEVEL SCRAM DUE TO AN INADEQUATE PROCEDURE ASSOCIATED WITH OPERATING PLANT CIRC WATER SYSTEM WITH AN INOPERABLE HEATER DRAIN PUMP.

**SSA** 03/12/89 LER# 31189005 50.72#: 15000 POWER: 100  
DESC: LOST '2D' VITAL INSTRUMENT INVERTER DUE TO A FUSE FALLING OUT OF ITS HOLDER CAUSING A LOW SG LEVEL AND A SAFETY INJECTION ON HIGH STEAMLINE FLOW COINCIDENT WITH LOW STEAMLINE PRESSURE.

**SCRAM** 03/12/89 LER# 31189005 50.72#: 15000 POWER: 100  
DESC: LOST '2D' VITAL INSTRUMENT BUS WHEN A FUSE FELL OUT OF ITS HOLDER AND CAUSED A LOW SG LEVEL SCRAM.

PI EVENTS FOR 89-2

**SCRAM** 04/11/89 LER# 31189008 50.72#: 15290 POWER: 100  
DESC: DURING STROKE TIME TESTING OF THE MSIV'S THE MSIV'S WENT CLOSED. THIS CAUSED A LOW SG LEVEL AND A SUBSEQUENT REACTOR TRIP.

TABLE 8.83 (CONT.)

## SALEM 2 (CONT.)

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.65	.00	.00	1.94	1.39	3.29	1.12	.52
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	1	0	0	4	2	1	2	1
SAFETY SYSTEM ACTUATIONS	0	0	0	1	0	0	1	0
SIGNIFICANT EVENTS	1	1	0	1	0	0	0	0
SAFETY SYSTEM FAILURES	2	4	0	2	2	1	0	0
FORCED OUTAGE RATE (%)	22	0	0	8	7	72	23	14
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.46	2.43	2.08	6.58	1.68	2.06
CRITICAL HOURS	1547	912	2184	2061	1444	304	1783	1939
COLLECTIVE RADIATION EXPOSURE	20	263	44	15	109	92	9	NA
CAUSE CODES:								
ADMINISTRATIVE	0	5	4	1	5	3	4	NA
LICENSED OPERATOR	1	1	0	1	0	1	0	NA
OTHER PERSONNEL	1	0	1	3	0	1	2	NA
MAINTENANCE	1	6	5	7	5	5	5	NA
A) MAINT PERSONNEL	1	2	1	1	0	1	2	NA
B) SURV AND TEST	0	4	3	2	4	2	2	NA
C) EQUIPMENT	0	0	3	4	1	3	1	NA
D) POTENTIAL MAINT	0	0	2	3	1	2	0	NA
DESIGN/INSTALLATION/FABRICATION	0	3	1	3	3	1	3	NA
EQUIPMENT FAILURE	0	0	0	3	0	1	1	NA

**TABLE 8.84**  
**SAN ONOFRE 1**

**PI EVENTS FOR 88-3**

**NONE**

**PI EVENTS FOR 88-4**

**SE** 12/12/88 LER# 20688019 50.72#: 14223 POWER: 0  
DESC: AN ELECTRICAL DESIGN DEFICIENCY COULD CAUSE A NON-CLASS 1E SWING BUS NOT TO LOAD SHED ON A D/G START WITH AN SI SIGNAL PRESENT. A SINGLE FAILURE COULD CAUSE LOSS OF A DIESEL GENERATOR SINCE DIESEL WOULD BE REQUIRED TO OPERATE ABOVE ITS T/S RATING.

**SE** 12/12/88 LER# 50.72#: 14215 POWER: 0  
DESC: 195 STEAM GENERATOR TUBES MAY NOT HAVE BEEN HARD ROLLED. THE POTENTIAL EXISTS FOR THEM TO PULL OUT OF THE TUBE SHEET IN THE EVENT OF A STEAM LINE BREAK ACCIDENT.

**SSF** 12/13/88 LER# 20688019 50.72#: 14223 POWER: 0  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: DESIGN ERROR, EMERGENCY DIESEL GENERATOR LOAD COULD HAVE EXCEEDED T.S. LOAD LIMITS DUE TO DEFICIENCIES IN THE AUTO LOAD CONTROLS.

**PI EVENTS FOR 89-1**

**SSF** 01/27/89 LER# 20689003 50.72#: 14581 POWER: 0  
SYSTEM: CLOSED/COMPONENT COOLING WATER SYSTEM  
DESC: AS A RESULT OF DESIGN REVIEW OF THE NON-ESSENTIAL INSTRUMENT AIR SYSTEM (RESPONSE TO GENERIC LTR 88-14) CCW FLOW TO THE RHR HX DURING A LOCA COULD BE DEGRADED BELOW THE SAFETY ANALYSIS LEVEL WITH LOSS OF THE INSTRUMENT AIR SYSTEM.

**SE** 02/02/89 LER# 50.72#: POWER: 0  
DESC: FASTENERS ON THERMAL SHIELD SUPPORT BLOCKS FOUND BROKEN. EVENT DATE UNKNOWN. MRR NOTIFIED BY A TELECON ON 02/02/89.

**SSF** 02/27/89 LER# 20689007 50.72#: 14877 POWER: 0  
SYSTEM: PLANT PROTECTION SYSTEM  
DESC: AN ERROR WAS DISCOVERED IN THE RPS SINGLE FAILURE ANALYSIS SUCH THAT FAILURE OF MEASURED FLOW AND A SEIZED RCP ROTOR IN THE SAME LOOP WOULD HAVE RESULTED IN EXCESSIVE FUEL CLADDING TEMPERATURE ABOVE ACCEPTANCE CRITERIA.

**SE** 03/02/89 LER# 50.72#: 14907 POWER: 0  
DESC: DESIGN DEFICIENCY WITH THE EDG LOAD SEQUENCER LOGIC.

**SSF** 03/03/89 LER# 20689008 50.72#: 14921 POWER: 0  
SYSTEM: HIGH PRESSURE SAFETY INJECTION SYSTEM  
DESC: DESIGN REVIEW FOUND THAT SINGLE FAILURE OF A HANDSWITCH COULD ENERGIZE A SOLENOID, OPEN THE CONTAINMENT FIRE SUPPRESSION SYSTEM CONTROL VALVE AND DIVERT FLOW FROM THE CONTAINMENT SPRAY SYSTEM, CAUSING DEGRADATION OF ITS SAFETY FUNCTION DURING A LOCA.

**SSF** 03/23/89 LER# 20689011 50.72#: 15100 POWER: 0  
SYSTEM: HIGH PRESSURE SAFETY INJECTION SYSTEM  
DESC: MFPS FUNCTION AS HPSI PUMPS AT UNIT 1. THE MINIMUM FLOW VALVES WOULD NOT CLOSE WITHIN REQUIRED TIME CAUSING ACTUAL SI FLOW LESS THAN ASSUMED DURING CERTAIN ACCIDENT SCENARIOS. POTENTIAL TO EXCEED PEAK FUEL CLAD TEMPERATURE (TOO MUCH FLOW DIVERTED).

**PI EVENTS FOR 89-2**

**NONE**

**TABLE 8.84 (CONT.)**  
**SAN ONOFRE 1 (CONT.)**

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	0	0	0	0	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	2	2	0
SAFETY SYSTEM FAILURES	1	0	1	1	0	1	4	0
FORCED OUTAGE RATE (%)	3	0	0	0	0	0	0	87
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	4.81
CRITICAL HOURS	2141	2209	1069	0	1354	1395	0	209
COLLECTIVE RADIATION EXPOSURE	65	70	84	85	47	62	77	NA
CAUSE CODES:								
ADMINISTRATIVE	1	2	7	1	1	1	3	NA
LICENSED OPERATOR	0	0	0	0	0	0	1	NA
OTHER PERSONNEL	0	2	1	1	1	2	1	NA
MAINTENANCE	2	4	6	2	2	3	3	NA
A) MAINT PERSONNEL	1	2	1	0	0	2	0	NA
B) SURV AND TEST	1	0	4	2	1	1	1	NA
C) EQUIPMENT	1	2	0	0	1	1	1	NA
D) POTENTIAL MAINT	1	1	3	0	1	0	1	NA
DESIGN/INSTALLATION/FABRICATION	1	2	2	2	2	3	5	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

**TABLE 8.85**  
**SAN ONOFRE 2**

**PI EVENTS FOR 88-3**

**SSF** 07/01/88 LER# 36188017 50.72#: 12710 POWER: 100  
SYSTEM: FUEL POOL COOLING AND PURIFICATION SYSTEM  
DESC: DISCOVERED THAT 9000 GAL HAD SIPHONED FROM THE SPENT FUEL INTO THE REACTOR CAVITY (AT UNIT 3).  
PROCEDURE ERROR.

**SSF** 08/06/88 LER# 36188027 50.72#: 13844 POWER: 100  
SYSTEM: INSTRUMENT AND UNINTERRUPTIBLE POWER SYSTEM - CLASS 1E  
DESC: SHUTDOWN COOLING ISOL. VALVE EMERGENCY POWER SUPPLY THE ASSOC. INVERTER SHUT OFF AT A BATTERY VOLTAGE  
LESS THAN MIN. ALL INVERTERS UNITS 2 AND 3 SETPOINTS WRONG. POTENTIAL FAIL TO INITIATE SDC.

**PI EVENTS FOR 88-4**

**SE** 12/15/88 LER# 36188034 50.72#: 14250 POWER: 0  
DESC: 19 VALVES IN CCW SYSTEM MAY FAIL DURING A SEISMIC EVENT RENDERING THE CCW INOPERABLE.

**SSF** 12/15/88 LER# 36188034 50.72#: 14250 POWER: 100  
SYSTEM: CLOSED/COMPONENT COOLING WATER SYSTEM  
DESC: CCW DID NOT MEET ITS DESIGN BASIS: 15 SAFETY RELATED VALVES IN THE SYSTEM PROVIDED WITH NON-1E CONTROL  
CIRCUITS WHICH MIGHT SPURIOUSLY OPERATE IN CONJUNCTION WITH DBA.

**PI EVENTS FOR 89-1**

NONE

**PI EVENTS FOR 89-2**

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	0	0	0	0	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	0	0
SIGNIFICANT EVENTS	1	0	0	0	0	1	0	0
SAFETY SYSTEM FAILURES	0	0	1	1	2	1	0	0
FORCED OUTAGE RATE (%)	0	8	0	0	3	0	34	28
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	1.92	.00	.00	.46	.00	.59	.63
CRITICAL HOURS	1419	522	1826	2092	2160	2209	1419	1584
COLLECTIVE RADIATION EXPOSURE	65	70	84	83	47	62	77	NA
CAUSE CODES:								
ADMINISTRATIVE	2	5	1	3	5	1	4	NA
LICENSED OPERATOR	0	0	0	0	0	0	2	NA
OTHER PERSONNEL	5	2	2	2	3	2	1	NA
MAINTENANCE	7	10	6	8	7	2	5	NA
A) MAINT PERSONNEL	4	4	1	2	1	0	2	NA
B) SURV AND TEST	2	4	0	3	4	0	3	NA
C) EQUIPMENT	0	1	5	4	1	1	1	NA
D) POTENTIAL MAINT	1	3	4	3	2	1	0	NA
DESIGN/INSTALLATION/FABRICATION	3	2	3	2	4	3	1	NA
EQUIPMENT FAILURE	0	0	0	1	0	1	1	NA

**TABLE 8.86**  
**SAN ONOFRE 3**

**PI EVENTS FOR 88-3**

**SSF** 07/01/88 LER# 36188017 50.72#: 12710 POWER: 100  
SYSTEM: FUEL POOL COOLING AND PURIFICATION SYSTEM  
DESC: DISCOVERED THAT 9000 GAL HAD SIPHONED FROM THE SPENT FUEL INTO THE REACTOR CAVITY (AT UNIT 3).  
PROCEDURE ERROR.

**SSF** 08/06/88 LER# 36188027 50.72#: 13844 POWER: 100  
SYSTEM: INSTRUMENT AND UNINTERRUPTIBLE POWER SYSTEM - CLASS 1E  
DESC: SHUTDOWN COOLING ISOL. VALVE EMERGENCY POWER SUPPLY THE ASSOC. INVERTER SHUT OFF AT A BATTERY VOLTAGE  
LESS THAN MIN. ALL INVERTERS UNITS 2 AND 3 SETPOINTS WRONG. POTENTIAL FAIL TO INITIATE SDC.

**PI EVENTS FOR 88-4**

**SE** 12/15/88 LER# 36188034 50.72#: 14250 POWER:  
DESC: 19 VALVES IN CCW SYSTEM MAY FAIL DURING A SEISMIC EVENT RENDERING THE CCW INOPERABLE.

**SSF** 12/15/88 LER# 36188034 50.72#: 14250 POWER: 100  
SYSTEM: CLOSED/COMPONENT COOLING WATER SYSTEM  
DESC: CCW DID NOT MEET ITS DESIGN BASIS: 15 SAFETY RELATED VALVES IN THE SYSTEM PROVIDED WITH NON-1E CONTROL  
CIRCUITS WHICH MIGHT SPURIOUSLY OPERATE IN CONJUNCTION WITH DBE.

**PI EVENTS FOR 89-1**

**SSA** 01/06/89 LER# 36289001 50.72#: 14437 POWER: 100  
DESC: FAULT IN UNINTERRUPTABLE POWER SUPPLY CAUSED VOLTAGE TRANSIENT TO MFW CAUSED SCRAM AND SIAS ACTUATION.

**SCRAM** 01/06/89 LER# 36289001 50.72#: 14437 POWER: 100  
DESC: FAULT ON UNINTERRUPTABLE POWER TRANSFORMER SUPPLY CAUSED VOLTAGE TRANSIENT TO MFW CAUSING LOW SG  
LEVEL SCRAM.

**PI EVENTS FOR 89-2**

**SCRAM** 04/07/89 LER# 36289006 50.72#: 15243 POWER: 100  
DESC: MOTOR GENERATOR VOLTAGE DIPPED FAR ENOUGH TO CAUSE A TURBINE TRIP. THE TURBINE TRIP CAUSED THE  
REACTOR TRIP.

**SSF** 06/30/89 LER# 50.72#: 15906 POWER: 75  
SYSTEM: LOW PRESSURE SAFETY INJECTION SYSTEM  
DESC: LPSI SYSTEM INOPERABLE WHEN THE LPSI PUMP FAILED AN IN SERVICE TEST FOLLOWING MAINTENANCE. PLANT  
COMMENCED SHUTDOWN PER TECH. SPECS. AS TIME CLOCK WOULD HAVE EXPIRED.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.46	.00	.00	.00	.00	.47	.52
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	1	0	0	0	0	1	1
SAFETY SYSTEM ACTUATIONS	0	0	1	0	0	0	1	0
SIGNIFICANT EVENTS	0	0	0	0	0	1	0	0
SAFETY SYSTEM FAILURES	0	0	1	1	2	1	0	1
FORCED OUTAGE RATE (%)	0	2	14	0	6	0	3	12
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.52	.00	.00	.00	.47	1.04
CRITICAL HOURS	2208	2190	1936	697	1090	2209	2110	1924
COLLECTIVE RADIATION EXPOSURE	65	70	84	85	47	62	77	NA
CAUSE CODES:								
ADMINISTRATIVE	2	2	3	2	6	1	4	NA
LICENSED OPERATOR	0	0	1	1	1	0	1	NA
OTHER PERSONNEL	2	0	3	1	5	0	2	NA
MAINTENANCE	5	1	8	3	9	2	5	NA
A) MAINT PERSONNEL	1	0	1	2	2	0	4	NA
B) SURV AND TEST	2	1	2	0	7	1	1	NA
C) EQUIPMENT	2	0	6	2	0	0	0	NA
D) POTENTIAL MAINT	1	0	4	1	1	1	0	NA
DESIGN/INSTALLATION/FABRICATION	0	0	3	2	4	3	0	NA
EQUIPMENT FAILURE	0	0	0	0	0	1	0	NA

**TABLE 8.87**

**SEABROOK**

**PI EVENTS FOR 88-3**

**SSA** 08/10/88 LER# 44388004 50.72#: 13157 POWER: 0  
 DESC: ALTERNATE POWER SUPPLY DID NOT AUTO TRANSFER WHEN LOAD DISPATCHERS OPENED BKR TO 345 KV POWER SUPPLY.  
 DIESEL 'A' STARTED 'B' OOS FOR MAINTENANCE.

**PI EVENTS FOR 88-4**

**BSF** 12/08/88 LER# 44388009 50.72#: POWER: 0  
 SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
 DESC: TEST OF THE RHR PUMP THRUST BEARING INDICATED PREMATURE DEGRADATION COULD OCCUR WHICH COULD RESULT IN  
 THE UNANTICIPATED SHUTDOWN OF THE SYSTEM. EXCESSIVE VIBRATION PROMPTED TEST. DESIGN ERROR -  
 BEARING

**PI EVENTS FOR 89-1**

**BSF** 03/25/89 LER# 44389005 50.72#: POWER: 0  
 SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
 DESC: THE B TRAIN EDG WAS DECLARED INOPERABLE DUE TO A SERVICE WATER VALVE FAILURE TO OPEN WHEN EDG STARTED  
 FOR TEST. THE A TRAIN EDG WAS OUT OF SERVICE DURING THE PERIOD THAT THE B TRAIN EDG WAS  
 CONSIDERED INOPERABLE.

**PI EVENTS FOR 89-2**

**NONE**

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	NA	NA	NA	NA	NA	NA	NA	.00
SCRAMS < 15% POWER	NA	NA	NA	NA	NA	NA	NA	0
TOTAL SCRAMS	NA	NA	NA	NA	NA	NA	NA	0
SAFETY SYSTEM ACTUATIONS	1	0	0	0	1	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	1	0	0	0	0	1	1	0
FORCED OUTAGE RATE (%)	NA	NA	NA	NA	NA	NA	NA	NA
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	NA	NA	NA	NA	NA	NA	NA	NA
CRITICAL HOURS	NA	NA	NA	NA	NA	NA	NA	194
COLLECTIVE RADIATION EXPOSURE	NA	NA	NA	NA	NA	NA	NA	NA
CAUSE CODES:								
ADMINISTRATIVE	1	2	1	1	1	1	1	NA
LICENSED OPERATOR	0	0	0	0	0	0	0	NA
OTHER PERSONNEL	0	0	1	0	1	1	1	NA
MAINTENANCE	2	2	2	1	1	2	5	NA
A) MAINT PERSONNEL	0	1	1	0	0	1	0	NA
B) SURV AND TEST	1	1	1	1	1	0	2	NA
C) EQUIPMENT	1	0	0	0	0	0	2	NA
D) POTENTIAL MAINT	1	0	0	0	0	1	1	NA
DESIGN/INSTALLATION/FABRICATION	1	1	1	0	0	1	0	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA



**TABLE 8.88**

**SEQUOYAH 1**

**PI EVENTS FOR 88-3**

**SSF** 08/02/88 LER# 32888032 50.72#: 13075 POWER: 0  
 SYSTEM: EMERGENCY/STANDBY GAS TREATMENT SYSTEM  
 DESC: BOTH TRAINS OF THE EMERGENCY GAS TREATMENT SYSTEM DECLARED INOPERABLE BASED ON A POSTULATED FAILURE OF A SINGLE COMPONENT IN A DIFFERENTIAL TRANSMITTER. SYSTEM IS SHARED BETWEEN UNITS, DESIGN ERROR

**PI EVENTS FOR 88-4**

**SCRAM** 11/18/88 LER# 32788045 50.72#: 14032 POWER: 72  
 DESC: GROUND FAULT INTERNAL TO THE GENERATOR FOR A 'C' PHASE STATOR BAR CAUSED A TURBINE TRIP AND A REACTOR TRIP.

**SCRAM** 12/26/88 LER# 32788047 50.72#: 14341 POWER: 7  
 DESC: WHEN PLACING TURBINE ONLINE - SPARKS CAME FROM GENERATOR HOUSING NECESSITATING A TURBINE TRIP - MFP TRIPPED ON HIGH SG LEVEL - AFW COULD NOT CONTROL SG LEVEL CAUSING LOW SG LEVEL AND A REACTOR TRIP.

**PI EVENTS FOR 89-1**

**SCRAM** 02/10/89 LER# 32789005 50.72#: 14724 POWER: 100  
 DESC: FF/SF MISMATCH SCRAM WHEN TECH TOUCHED A SCREWDRIVER TO TWO TEST LUGS ON CONDENSATE RECORDER CAUSING SOLID STATE PROTECTION SYSTEM SIGNAL SCRAM.

**SSF** 03/20/89 LER# 32789008 50.72#: 15073 POWER: 100  
 SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
 DESC: TORNADO DAMPERS FOR THE CONTROL ROOM FRESH AIR INTAKE WERE CLOSED TO FACILITATE MAINT. REPLACEMENT OF SMOKE DETECTORS IN THE PRESSURIZING FAN SUPPLY DUCTS. THIS REMOVED THE SUCTION TO BOTH PRESSURIZING FANS. BOTH TRAINS INOPERABLE. PERSONNEL ERROR.

**PI EVENTS FOR 89-2**

**SSF** 04/13/89 LER# 32789011 50.72#: POWER: 100  
 SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
 DESC: DUE TO DEFICIENCIES IN RHR PUMP TEST PROCEDURES WHICH CLOSE THE RHR CROSS-TIE VALVES AND COLD LEG INJECTION VALVES, THE RHR INJECTION MAY NOT MEET DESIGN BASIS REQUIREMENTS OF 4 LEG INJECTION AND MINIMUM FLOW DURING A GUILLOTINE BREAK EVENT.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	2.63	.47	.00
SCRAMS < 15% POWER	0	0	0	0	0	1	0	0
TOTAL SCRAMS	0	0	0	0	0	2	1	0
SAFETY SYSTEM ACTUATIONS	1	0	0	1	0	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	7	4	2	1	1	0	1	1
FORCED OUTAGE RATE (%)	100	100	100	100	100	87	3	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	5.26	.00	.00
CRITICAL HOURS	0	0	0	0	0	380	2111	2183
COLLECTIVE RADIATION EXPOSURE	49	41	NA	124	131	19	302	NA
CAUSE CODES:								
ADMINISTRATIVE	14	9	15	5	6	6	5	NA
LICENSED OPERATOR	0	1	3	0	0	1	1	NA
OTHER PERSONNEL	7	1	5	3	4	6	7	NA
MAINTENANCE	14	9	16	7	9	12	6	NA
A) MAINT PERSONNEL	5	0	5	6	2	5	3	NA
B) SURV AND TEST	9	7	11	1	5	4	3	NA
C) EQUIPMENT	0	1	4	1	2	5	2	NA
D) POTENTIAL MAINT	0	1	2	1	2	3	1	NA
DESIGN/INSTALLATION/FABRICATION	17	6	6	3	3	1	0	NA
EQUIPMENT FAILURE	1	0	0	0	0	0	0	NA

**TABLE 8.89**

**SEQUOYAH 2**

**PI EVENTS FOR 88-3**

**SSF** 07/30/88 LER# 32888033 50.72#: 13041 POWER: 55

SYSTEM: UPPER HEAD INJECTION

DESC: LICENSEE DISCOVERED AN ERROR IN THE CALIBRATION OF THE UPPER HEAD INJECTION TANK LEVEL SWITCHES SUCH THAT INJECTION WOULD HAVE ISOLATED SOONER THAN HAD BEEN ASSUMED IN THE LOCA ANALYSIS.

**SSF** 08/02/88 LER# 32888032 50.72#: 13075 POWER: 95

SYSTEM: EMERGENCY/STANDBY GAS TREATMENT SYSTEM

DESC: BOTH TRAINS OF THE EMERGENCY GAS TREATMENT SYSTEM DECLARED INOPERABLE BASED UPON A POSTULATED FAILURE OF A SINGLE COMPONENT IN A DIFFERENTIAL TRANSMITTER, DESIGN ERROR. SYSTEM IS SHARED BETWEEN UNITS.

**SSA** 08/15/88 LER# 32888034 50.72#: 13204 POWER: 98

DESC: LOST '1A' START BUS WHICH POWERS '1BB' SHUTDOWN BOARD - ALL 4 DIESELS STARTED.

**PI EVENTS FOR 88-4**

**NONE**

**PI EVENTS FOR 89-1**

**SSF** 03/20/89 LER# 32789008 50.72#: 15073 POWER: 0

SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM

DESC: TORNADO DAMPERS FOR THE CONTROL ROOM FRESH AIR INTAKE WERE CLOSED TO FACILITATE MAINT. REPLACEMENT OF SMOKE DETECTORS IN THE PRESSURIZING FAN SUPPLY DUCTS. THIS REMOVED THE SUCTION TO BOTH PRESSURIZING FANS. BOTH TRAINS INOPERABLE. PERSONNEL ERROR.

**SSA** 03/25/89 LER# 32889002 50.72#: 15121 POWER: 0

DESC: INADEQUATE PROCEDURE ALLOWED THE PRESSURIZER LOW PRESSURE SETPOINT TO BECOME UNBLOCKED CAUSING A SAFETY INJECTION SIGNAL.

**SSA** 03/25/89 LER# 32889002 50.72#: 15122 POWER: 0

DESC: THE LACK OF NOT PROMPTLY ADDRESSING AN EARLIER EVENT LEAD TO A SAFETY INJECTION ON HIGH STEAM FLOW COINCIDENT WITH LOW-LOW AVERAGE REACTOR COOLANT TEMPERATURE.

**PI EVENTS FOR 89-2**

**SSF** 04/13/89 LER# 32789011 50.72#: POWER: 0

SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM

DESC: DUE TO DEFICIENCIES IN RHR PUMP TEST PROCEDURES WHICH CLOSE THE RHR CROSS-TIE VALVES AND COLD LEG INJECTION VALVES, THE RHR INJECTION MAY NOT MEET DESIGN BASIS REQUIREMENTS OF 4 LEG INJECTION AND MINIMUM FLOW DURING A GUILLOTINE BREAK EVENT.

**SCRAM** 04/15/89 LER# 32889005 50.72#: 15339 POWER: 30

DESC: PERSONNEL ERROR ALONG WITH PROCEDURAL INADEQUACY LEAD TO A REACTOR TRIP ON LOW-LOW SG LEVEL WHILE TESTING THE MAIN TURBINE OVERSPEED CIRCUIT.

**SCRAM** 04/16/89 LER# 32889005 50.72#: 15350 POWER: 16

DESC: OPERATOR WAS CONTROLLING STEAM GENERATOR LEVEL MANUALLY WITH THE FEEDWATER REGULATING VALVE. A LOW-LOW SG LEVEL WAS REACHED RESULTING IN A REACTOR TRIP.

**SCRAM** 04/19/89 LER# 32889005 50.72#: 15377 POWER: 18

DESC: DURING POWER ESCALATION AND FEEDWATER REGULATOR CONTROL FROM BYPASS TO MAIN REGULATOR THE MFP'S TRIPPED, AUXILIARY FEEDWATER INITIATED, AND THE REACTOR TRIPPED ON LOW SG LEVEL.

TABLE 8.89 (CONT.)

## SEQUOYAH 2 (CONT.)

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	5.10	.00	.00	.00	1.78
SCRAMS < 15% POWER	0	0	0	1	0	0	0	0
TOTAL SCRAMS	0	0	0	5	0	0	0	3
SAFETY SYSTEM ACTUATIONS	0	0	1	0	1	0	2	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	6	4	5	0	2	0	1	1
FORCED OUTAGE RATE (%)	100	100	100	69	0	0	0	16
EQUIP. FORCED OUTAGFS/1000 CRITICAL HOURS	.00	.00	.00	3.82	.00	.00	.00	.59
CRITICAL HOURS	0	0	0	785	2208	2209	429	1687
COLLECTIVE RADIATION EXPOSURE	49	41	NA	124	131	19	302	NA
CAUSE CODES:								
ADMINISTRATIVE	14	8	20	6	7	1	4	NA
LICENSED OPERATOR	0	1	6	4	0	0	1	NA
OTHER PERSONNEL	5	1	5	3	5	2	3	NA
MAINTENANCE	14	9	22	10	12	3	4	NA
A) MAINT PERSONNEL	5	0	8	5	2	1	1	NA
B) SURV AND TEST	9	6	13	4	7	1	2	NA
C) EQUIPMENT	0	2	5	1	4	0	2	NA
D) POTENTIAL MAINT	0	2	5	1	4	1	0	NA
DESIGN/INSTALLATION/FABRICATION	17	8	7	5	3	1	1	NA
EQUIPMENT FAILURE	1	1	1	0	2	0	0	NA

**TABLE 8.90**  
**SHEARON HARRIS**

**PI EVENTS FOR 88-3**

**SSF** 07/26/88 LER# 40088017 50.72#: 12971 POWER: 83  
SYSTEM: REACTOR BUILDING ENVIRONMENTAL CONTROL SYSTEM  
DESC: BOTH TRAINS OF THE REACTOR BUILDING EMERGENCY EXHAUST SYSTEM INOPERABLE. ONE TRAIN WAS PREVIOUSLY OUT AND THE "A" ESW PUMP TRAVELLING SCREEN FAILED MAKING REDUNDANT TRAIN OUT.

**SSF** 08/12/88 LER# 40088023 50.72#: 13177 POWER: 0  
SYSTEM: REACTOR COOLANT SYSTEM  
DESC: ONE PORV GAGGED OPEN AND THE OTHER TWO PORVS WERE CLOSED WITH N2 REMOVED. THE GAGING DEVICE SLIPPED AND THE PORV WENT TO 50% OPEN. ANALYSIS DETERMINED THE RCS DID NOT HAVE SUFFICIENT VENT AREA.

**SSF** 09/09/88 LER# 40088026 50.72#: POWER: 0  
SYSTEM: ENGINEERED SAFETY FEATURES ACTUATION SYSTEM  
DESC: EQ DEFICIENCIES IN SOLENOID VALVES, POTENTIAL VALVE FAILURE DURING ACCIDENT CONDITIONS; RCS VENT HEAD VENTS, N2 SAMPLE, AND CONTAINMENT ISOLATION.

**SE** 09/21/88 LER# 50.72#: 13505 POWER: 0  
DESC: LOSS OF BOTH TRAINS OF RHR DURING MID-LOOP OPERATIONS.

**PI EVENTS FOR 88-4**

**SSA** 12/21/88 LER# 40088035 50.72#: 14303 POWER: 100  
DESC: SECURING FROM TESTING 6.9KV BUSES WHEN '1A-SA' EMERGENCY BUS DEENERGIZED DUE TO A FAULTY RELAY AND '1A-SA' DIESEL STARTED AND LOADED BUS.

**PI EVENTS FOR 89-1**

**SCRAM** 01/16/89 LER# 40089001 50.72#: 14511 POWER: 100  
DESC: VALVE ON AUX STEAM INOPERABLE AND PARTIALLY OPEN, DUE TO A DANGER TAG, CAUSING LOSS OF CONDENSOR VACUUM DUE TO DIRECT PATH TO ATMOSPHERE. TURBINE TRIPPED ON LOW VACUUM AND A REACTOR TRIP RESULTED.

**SCRAM** 02/06/89 LER# 40089003 50.72#: 14659 POWER: 60  
DESC: 'A' MFP TRIPPED DUE TO A SHEARED SHAFT CAUSING RUNBACK TO 60% POWER - CAUSING SG SHRINK AND LOW SG LEVEL SCRAM.

**SCRAM** 02/07/89 LER# 40089004 50.72#: 14679 POWER: 48  
DESC: FAILURE OF HYDROPNEUMATIC TANK LEVEL CONTROL SWITCH CAUSED LOSS OF CIRC WATER DUE TO LOSS OF SEAL WATER. LOW CONDENSER VACUUM TURBINE TRIP SCRAM FOLLOWED.

**SCRAM** 02/22/89 LER# 40089005 50.72#: 14828 POWER: 100  
DESC: A PROCEDURAL INEXPLICITNESS ON SG LEVEL CALIBRATION PROCEDURE CAUSED FF/SF MISMATCH SCRAM.

**SCRAM** 03/14/89 LER# 40089006 50.72#: 15012 POWER: 100  
DESC: MFP ELECTRICAL MOTOR TERMINAL BOX NOT WATERPROOF - WHEN WATER FROM DELUGE SYSTEM WAS INADVERTENTLY SPRAYED DURING MAINTENANCE, CAUSED MFP TRIP AND SCRAM ON LOW SG LEVEL.

**PI EVENTS FOR 89-2**

NONE

**TABLE 8.90 (CONT.)**  
**SHEARON HARRIS (CONT.)**

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.15	.00	.50	.00	.00	.00	2.41	.00
SCRAMS < 15% POWER	0	1	0	0	0	0	0	0
TOTAL SCRAMS	2	1	1	0	0	0	5	0
SAFETY SYSTEM ACTUATIONS	1	2	0	1	0	1	0	0
SIGNIFICANT EVENTS	0	1	0	0	1	0	0	1
SAFETY SYSTEM FAILURES	3	1	2	3	3	0	0	0
FORCED OUTAGE RATE (%)	20	1	9	0	0	5	6	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	2.30	.00	1.00	.00	.00	.59	1.44	.00
CRITICAL HOURS	1739	1495	1994	2183	700	1708	2078	2183
COLLECTIVE RADIATION EXPOSURE	NA	NA	NA	NA	NA	NA	6	NA
CAUSE CODES:								
ADMINISTRATIVE	6	6	3	4	4	2	3	NA
LICENSED OPERATOR	3	?	0	1	1	1	0	NA
OTHER PERSONNEL	3	5	1	4	4	6	6	NA
MAINTENANCE	13	9	5	7	9	6	6	NA
A) MAINT PERSONNEL	4	0	0	1	1	5	3	NA
B) SURV AND TEST	3	8	3	3	6	3	3	NA
C) EQUIPMENT	6	2	3	4	5	1	0	NA
D) POTENTIAL MAINT	3	1	1	2	3	0	0	NA
DESIGN/INSTALLATION/FABRICATION	7	2	4	1	3	0	2	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	1	NA

TABLE 8.91

SHOREHAM

PI EVENTS FOR 88-3

SSA 07/26/88 LER# 32288012 50.72#: 13009 POWER: 0  
 DESC: LOW LEVEL SIGNAL DURING TESTING CAUSED HPCI AND RCIC VALVES TO OPEN. PUMPS DID NOT START.

PI EVENTS FOR 88-4

NONE

PI EVENTS FOR 89-1

NONE

PI EVENTS FOR 89-2

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	0	0	0	0	0
SAFETY SYSTEM ACTUATIONS	1	0	0	1	1	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	1	0	0	0	0	0	0	0
FORCED OUTAGE RATE (%)	NA	NA	NA	NA	NA	NA	NA	NA
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	NA	NA	NA	NA	NA	NA	NA	NA
CRITICAL HOURS	0	0	0	0	0	0	0	0
COLLECTIVE RADIATION EXPOSURE	NA	NA	NA	NA	NA	NA	NA	NA
CAUSE CODES:								
ADMINISTRATIVE	5	1	2	2	3	3	1	NA
LICENSED OPERATOR	0	0	0	0	0	0	1	NA
OTHER PERSONNEL	5	2	2	5	2	2	0	NA
MAINTENANCE	6	3	3	6	5	3	4	NA
A) MAINT PERSONNEL	1	0	1	1	0	0	1	NA
B) SURV AND TEST	4	3	2	5	3	2	1	NA
C) EQUIPMENT	1	0	0	0	2	0	1	NA
D) POTENTIAL MAINT	1	0	0	0	0	1	1	NA
DESIGN/INSTALLATION/FABRICATION	1	3	0	0	0	1	0	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

**TABLE 8.92**  
**SOUTH TEXAS 1**

**PI EVENTS FOR 88-3**

**SCRAM** 07/19/88 LER# 49888045 50.72#: 12883 POWER: 54  
DESC: AN I&C TECHNICIAN RESET ONE CHANNEL OF A DELTA-T INSTRUMENT WHILE ANOTHER CHANNEL WAS IN TEST, THIS CAUSED A REACTOR TRIP ON OVERTEMPERATURE/DELTA TEMPERATURE.

**SCRAM** 08/16/88 LER# 49888048 50.72#: 13215 POWER: 100  
DESC: A STATOR COOLING FLOW DISCHARGE CHECK VALVE FAILED TO CLOSE WHEN SECURING A COOLING SYSTEM PUMP. THIS CAUSED A TURBINE TRIP ON LOW STATOR COOLING FLOW. THIS RESULTED IN A REACTOR TRIP.

**SSA** 08/26/88 LER# 49888049 50.72#: 13300 POWER: 100  
DESC: HIGH STEAM FLOW SIGNAL WHEN MSIV OPENED AFTER SCRAM CAUSING HIGH AND LOW HEAD INJECTION.

**SCRAM** 08/26/88 LER# 49888049 50.72#: 13300 POWER: 100  
DESC: A DEFECTIVE FUSE BLOCK IN THE STATOR COOLING WATER TRIP CIRCUIT CAUSED A TURBINE TRIP AND SUBSEQUENT REACTOR TRIP.

**SSF** 09/02/88 LER# 49888052 50.72#: 13363 POWER: 13  
SYSTEM: REACTOR COOLANT SYSTEM  
DESC: FLOW ANOMOLY, THERMAL-HYDRAULIC INSTABILITY IN THE REACTOR VESSEL RESULTED IN A SLIGHT DECREASE IN COOLANT FLOW TO CERTAIN AREAS OF THE REACTOR CORE. RESULTANT DNB PENALTY 3.45%

**PI EVENTS FOR 88-4**

**SSA** 10/04/88 LER# 49888057 50.72#: 13616 POWER: 0  
DESC: DIESEL START ON STARTING CIRCUIT 4.16 KV ESF BUS STRIPPED OF LOADS - LOAD SEQUENCER WOULD NOT SHIFT BACK TO NORMAL WHEN RETURNING TO NORMAL DUE TO ELECTRICIAN BREAKING A SEQUENCER STATUS LIGHT.

**SSA** 10/06/88 LER# 49888059 50.72#: 13642 POWER: 0  
DESC: HIGH HEAD HPI PUMP STARTED INSTEAD OF LOW HEAD HPI PUMP WHEN OPERATOR OPERATED WRONG CONTROL SWITCH.

**SSF** 10/27/88 LER# 49888061 50.72#: POWER: 100  
SYSTEM: LOW PRESSURE SAFETY INJECTION SYSTEM  
DESC: AN EMERGENCY OPERATING PROCEDURE CONTAINED AN ERROR WHICH COULD HAVE RESULTED IN THE TERMINATION OF LPSI AND HPSI AS REQUIRED ACTIONS IN THE MITIGATION OF A STEAM GENERATOR TUBE RUPTURE. LER IS MARKED

**SSF** 11/29/88 LER# 49888063 50.72#: 14109 POWER: 100  
SYSTEM: LOW PRESSURE SAFETY INJECTION SYSTEM  
DESC: DESIGN ERROR DISCOVERED. ALL 3 TRAINS OF SAFETY INJECTION DECLARED INOPERABLE WHEN IT WAS DISCOVERED THAT VORTEX WATER BREAKERS WERE NOT INSTALLED IN THE EMERGENCY CONTAINMENT SUMPS.

**PI EVENTS FOR 89-1**

**SCRAM** 01/03/89 LER# 49889001 50.72#: 14396 POWER: 100  
DESC: POOR CONNECTION ON INTERCONNECTING WIRE IN EHC CAUSED GOVERNOR VALVES TO SHUT AND SCRAM ON RATE COMPENSATED OVERTEMPERATURE.

**SCRAM** 01/20/89 LER# 49889005 50.72#: 14541 POWER: 100  
DESC: FIRE IN #9 BEARING ON MAIN GENERATOR NECESSITATED A MANUAL SCRAM DUE A HYDROGEN LEAK CAUSING LOSS OF HYDROGEN COOLING.

**SSA** 01/21/89 LER# 49889006 50.72#: 14556 POWER: 0  
DESC: TEST PUSHBUTTON WAS INADVERTENTLY PUSHED WHILE BLEEDING DOWN AIR RECEIVERS CAUSING MAIN TRANSFORMER TO LOCKOUT CAUSING LOSS OF POWER TO 'A' ESF BUS CAUSING DIESEL TO START AND LOAD BUS.

TABLE 8.92 (CONT.)  
SOUTH TEXAS 1 (CONT.)

PI EVENTS FOR 89-2

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	NA	NA	.00	.00	1.73	.00	1.77	.00
SCRAMS < 15% POWER	NA	NA	1	0	0	0	0	0
TOTAL SCRAMS	NA	NA	1	0	3	0	2	0
SAFETY SYSTEM ACTUATIONS	0	2	4	0	1	2	1	0
SIGNIFICANT EVENTS	0	0	0	1	0	0	0	0
SAFETY SYSTEM FAILURES	0	4	4	4	1	2	0	0
FORCED OUTAGE RATE (%)	NA	NA	NA	NA	20	8	13	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	NA	NA	NA	NA	4.81	.00	1.77	.00
CRITICAL HOURS	0	0	384	1181	1735	1873	1129	2183
COLLECTIVE RADIATION EXPOSURE	NA	NA	NA	NA	NA	NA	NA	NA
CAUSE CODES:								
ADMINISTRATIVE	4	7	16	4	3	5	5	NA
LICENSED OPERATOR	1	1	3	1	1	2	0	NA
OTHER PERSONNEL	3	3	4	4	3	2	2	NA
MAINTENANCE	8	11	20	8	7	5	7	NA
A) MAINT PERSONNEL	3	4	1	2	2	3	2	NA
B) SURV AND TEST	3	5	13	5	5	2	4	NA
C) EQUIPMENT	2	3	3	1	3	0	0	NA
D) POTENTIAL MAINT	1	1	4	1	1	0	2	NA
DESIGN/INSTALLATION/FABRICATION	2	4	6	6	8	4	5	NA
EQUIPMENT FAILURE	1	2	1	0	0	0	0	NA



**TABLE 8.93**  
**SOUTH TEXAS 2**

**PI EVENTS FOR 88-3**

NONE

**PI EVENTS FOR 88-4**

NONE

**PI EVENTS FOR 89-1**

**SSA** 01/06/89 LER# 49989001 50.72#: 14432 POWER: 0  
DESC: STANDBY TRANSFORMER DELUGE SYSTEM ACTUATED CAUSED PARTIAL LOSS OF OFFSITE POWER - 'B' AND 'C' DIESEL STARTED AND LOADED BUS.

**SSA** 02/03/89 LER# 49989003 50.72#: 14628 POWER: 0  
DESC: DIESEL #23 STARTED WHEN FEEDER BREAKER TO 4160 ESF BUS 'C' OPENED DUE TO MISOPERATION OF A DIFFERENTIAL RELAY.

**SSA** 03/20/89 LER# 49989005 50.72#: 15065 POWER: 0  
DESC: FAULT ON STANDBY TRANSFORMER CAUSED TRANSFORMER LOCKOUT AND DIESEL #22 AND #23 STARTED AND LOADED BUSES.

**SSF** 03/22/89 LER# 49989007 50.72#: 15098 POWER: 0  
SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
DESC: BOTH TRAINS OF THE CREVS INOPERABLE. A JUMPER WAS FOUND TO BE INSTALLED IN ONE TRAIN TOXIC GAS MON. WHICH PREVENTED THE TOXIC GAS MONITOR FROM ACTIVATING THE C/R ENVELOPE INTAKE DAMPERS AS DESIGNED. THE OTHER TOXIC GAS MON. WAS OOS FOR MAINTENANCE.

**PI EVENTS FOR 89-2**

**SSA** 04/05/89 LER# 49989009 50.72#: 15213 POWER: 10  
DESC: AN AUXILIARY TRANSFORMER TRIPPED OFF-LINE. THIS CAUSED A LOSS OF VITAL POWER. DIESEL GENERATOR STARTED & LOADED.

**SCRAM** 04/05/89 LER# 49989009 50.72#: 15213 POWER: 10  
DESC: REACTOR TRIPPED DUE TO LOW REACTOR COOLANT FLOW RESULTING FROM A LOSS OF ALL REACTOR COOLANT PUMPS DUE TO AUXILIARY TRANSFORMER TRIPPING. ONE REACTOR COOLANT PUMP CIRCUIT BREAKER FAILED TO OPEN INITIALLY.

**SSA** 04/10/89 LER# 49989011 50.72#: 15274 POWER: 0  
DESC: OPERATOR MISSED HOLD OFF WHILE HEATING UP. SI ACTUATED ON LOW STEAMLINE PRESSURE. DG STARTED BUT DID NOT LOAD AS SI REMAINED ENERGIZED. 'A' TRAIN CONTROL ROOM HVAC CLEANUP FAN DIDN'T START.

**SCRAM** 04/15/89 LER# 49989013 50.72#: 15343 POWER: 24  
DESC: THE REACTOR TRIP BREAKER OPENED WITHOUT AN INITIATING SIGNAL CAUSING A REACTOR TRIP AND A TURBINE TRIP.

**SSA** 04/18/89 LER# 49989014 50.72#: 15374 POWER: 0  
DESC: A FAULT SENSED BY THE MAIN GENERATOR FAULT PROTECTION SYSTEM CAUSED A LOCKOUT AND A LOSS OF POWER TO EMERGENCY EQUIPMENT DIESEL GENERATOR STARTED AND PICKED UP THE LOAD.

**SCRAM** 06/02/89 LER# 49989016 50.72#: 15769 POWER: 76  
DESC: TURBINE TRIP WHILE PERFORMING MAIN TURBINE STEAM INLET VALVE OPERABILITY TEST CAUSED A REACTOR SCRAM WHEN A DEFECTIVE LIMIT SWITCH CAUSED A TRIP BISTABLE TO REMAIN LOCKED IN. A DEFICIENT PROCEDURE DID NOT VERIFY THE CONDITION PRIOR TO CONTINUING.

**TABLE 8.93 (CONT.)**  
**SOUTH TEXAS 2 (CONT.)**

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	NA	NA	NA	NA	NA	NA	.00	1.41
SCRAMS < 15% POWER	NA	NA	NA	NA	NA	NA	0	1
TOTAL SCRAMS	NA	NA	NA	NA	NA	NA	0	3
SAFETY SYSTEM ACTUATIONS	NA	NA	NA	NA	NA	0	3	3
SIGNIFICANT EVENTS	NA	NA	NA	NA	NA	0	0	0
SAFETY SYSTEM FAILURES	NA	NA	NA	NA	NA	0	1	0
FORCED OUTAGE RATE (%)	NA	NA	NA	NA	NA	NA	NA	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	NA	NA	NA	NA	NA	NA	NA	.00
CRITICAL HOURS	0	NA	NA	NA	NA	NA	411	1414
COLLECTIVE RADIATION EXPOSURE	NA	NA	NA	NA	NA	NA	NA	NA
CAUSE CODES:								
ADMINISTRATIVE	NA	NA	NA	NA	NA	0	4	NA
LICENSED OPERATOR	NA	NA	NA	NA	NA	0	0	NA
OTHER PERSONNEL	NA	NA	NA	NA	NA	0	0	NA
MAINTENANCE	NA	NA	NA	NA	NA	0	6	NA
A) MAINT PERSONNEL	NA	NA	NA	NA	NA	0	1	NA
B) SURV AND TEST	NA	NA	NA	NA	NA	0	3	NA
C) EQUIPMENT	NA	NA	NA	NA	NA	0	1	NA
D) POTENTIAL MAINT	NA	NA	NA	NA	NA	0	1	NA
DESIGN/INSTALLATION/FABRICATION	NA	NA	NA	NA	NA	1	1	NA
EQUIPMENT FAILURE	NA	NA	NA	NA	NA	0	0	NA

TABLE 8.94

ST. LUCIE 1

PI EVENTS FOR 88-3

SCRAM 09/20/88 LER# 33588020 50.72#: 13496 POWER: 100  
 DESC: A FAULTY PROCEDURE INSTRUCTED A TECHNICIAN TO REMOVE POWER FROM THE FEEDWATER REGULATING VALVE CAUSING THE VALVE TO SHUT, RESULTING IN A LOW SG LEVEL AND A REACTOR TRIP.

PI EVENTS FOR 88-4

NONE

PI EVENTS FOR 89-1

NONE

PI EVENTS FOR 89-2

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	1.01	.46	.46	.98	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	2	1	1	1	0	0	0
SAFETY SYSTEM ACTUATIONS	0	0	1	0	0	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	0	1	0	0	0	0	0	0
FORCED OUTAGE RATE (%)	0	12	1	1	8	0	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	1.51	.46	.46	2.95	.00	.00	.00
CRITICAL HOURS	2208	1988	2163	2165	1017	2209	2160	2132
COLLECTIVE RADIATION EXPOSURE	9	127	16	16	232	18	144	NA
CAUSE CODES:								
ADMINISTRATIVE	0	2	0	0	1	0	0	NA
LICENSED OPERATOR	0	1	1	0	1	0	0	NA
OTHER PERSONNEL	0	2	0	0	3	0	0	NA
MAINTENANCE	0	2	3	1	4	0	0	NA
A) MAINT PERSONNEL	0	1	1	0	2	0	0	NA
B) SURV AND TEST	0	1	0	0	2	0	0	NA
C) EQUIPMENT	0	1	2	0	2	0	0	NA
D) POTENTIAL MAINT	0	0	2	1	0	0	0	NA
DESIGN/INSTALLATION/FABRICATION	0	1	0	0	0	0	0	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

**TABLE 8.95**  
**ST. LUCIE 2**

**PI EVENTS FOR 88-3**

NONE

**PI EVENTS FOR 88-4**

NONE

**PI EVENTS FOR 89-1**

NONE

**PI EVENTS FOR 89-2**

**SCRAM** 06/27/89 LER# 50.72#: 15970 POWER: 22  
DESC: HIGH-HIGH SG LEVEL CAUSED A TURBINE TRIP SCRAM.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	1.12	.00	.00	.00	.00	.00	.64
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	1	0	0	0	0	0	1
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	0	0	0	0	0	0	0	0
FORCED OUTAGE RATE (%)	3	15	0	0	0	0	0	2
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.45	3.36	.00	.00	.00	.00	.00	.64
CRITICAL HOURS	2208	894	2184	2183	2208	2209	742	1560
COLLECTIVE RADIATION EXPOSURE	9	127	16	16	232	18	144	NA
CAUSE CODES:								
ADMINISTRATIVE	0	1	2	1	0	0	1	NA
LICENSED OPERATOR	0	0	1	1	0	0	2	NA
OTHER PERSONNEL	1	1	0	1	0	0	1	NA
MAINTENANCE	1	1	2	1	0	0	1	NA
A) MAINT PERSONNEL	0	1	0	0	0	0	1	NA
B) SURV AND TEST	1	0	0	1	0	0	1	NA
C) EQUIPMENT	0	0	1	0	0	0	0	NA
D) POTENTIAL MAINT	0	0	1	0	0	0	0	NA
DESIGN/INSTALLATION/FABRICATION	0	1	0	0	0	0	1	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	1	NA

**TABLE 8.96**

**SUMMFR**

**PI EVENTS FOR 88-3**

**SCRAM** 07/26/88 LER# 39588009 50.72#: 12964 POWER: 100  
 DESC: A FAULTY REACTOR TRIP BREAKER SWITCH CAUSED REACTOR TRIP BREAKERS TO OPEN DURING A TEST. IT WAS FOUND THAT THE SWITCH BREAKS BEFORE MAKING AND INTERRUPTS THE 48V UNDERVOLT SIGNAL.

**PI EVENTS FOR 88-4**

**SSA** 12/11/88 LER# 39588013 50.72#: 14209 POWER: 0  
 DESC: TECHS BECAME CONFUSED WHEN TESTING SOLID STATE PROTECTION SYSTEM AND BACKED-OUT OF PROCEDURE CAUSING 'B' TRAIN S1.

**PI EVENTS FOR 89-1**

**SSF** 01/15/89 LER# 39589002 50.72#: 14504 POWER: 100  
 SYSTEM: HIGH PRESSURE SAFETY INJECTION SYSTEM  
 DESC: SCAFFOLDING AND SHIELDING STORED IN PENETRATION ROOMS COULD HAVE IMPACTED THE OPERABILITY OF SAFETY RELATED SYSTEMS DURING A SEISMIC EVENT. OPERABILITY OF HPSI COULD NOT BE ASSURED. PERSONNEL ERROR.

**SSF** 02/17/89 LER# 39589003 50.72#: 14788 POWER: 0  
 SYSTEM: MAIN STEAM ISOLATION VALVES  
 DESC: ALL THREE MAIN STEAM ISOLATION VALVES WERE DECLARED INOPERABLE DUE TO A POSSIBILITY OF SPURIOUS ACTUATIONS FROM CIRCUIT GROUNDS. POSSIBILITY FOR VALVES TO OPEN UNDER CERTAIN ACCIDENT CONDITIONS. THIS WAS DETERMINED AS A RESULT OF DESIGN REVIEW.

**PI EVENTS FOR 89-2**

**SCRAM** 04/01/89 LER# 39589006 50.72#: 15184 POWER: 30  
 DESC: MFW ISOLATION VALVE SHUT DUE TO AIR IN FLOW TRANSMITTER SENDING A FALSE LOW SG LEVEL SIGNAL CAUSING LOW SG LEVEL SCRAM.

**SE** 05/28/89 LER# 50.72#: 15732 POWER: 0  
 DESC: SPURIOUS OPENING OF PRESSURIZER SAFETY VALVE.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.02	.46	.47	1.02	.55	.00	.00	.56
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	2	1	1	2	1	0	0	1
SAFETY SYSTEM ACTUATIONS	0	0	0	1	0	1	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	1
SAFETY SYSTEM FAILURES	2	1	0	1	0	0	2	0
FORCED OUTAGE RATE (%)	13	2	2	11	3	0	28	19
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.51	.46	.47	1.02	.00	.00	.00	.56
CRITICAL HOURS	1954	2175	2149	1956	1832	131	1588	1779
COLLECTIVE RADIATION EXPOSURE	10	9	8	8	28	464	27	NA
CAUSE CODES:								
ADMINISTRATIVE	2	3	0	1	2	0	2	NA
LICENSED OPERATOR	1	1	0	2	0	0	0	NA
OTHER PERSONNEL	2	2	1	0	1	2	2	NA
MAINTENANCE	7	3	2	2	1	3	3	NA
A) MAINT PERSONNEL	1	1	0	0	1	0	1	NA
B) SURV AND TEST	3	2	2	2	1	2	2	NA
C) EQUIPMENT	3	0	0	0	0	0	0	NA
D) POTENTIAL MAINT	2	0	0	0	0	1	0	NA
DESIGN/INSTALLATION/FABRICATION	3	2	3	1	0	2	1	NA
EQUIPMENT FAILURE	0	1	0	0	0	0	0	NA

**TABLE 8.97****SURRY 1****PI EVENTS FOR 88-3**

**SSA** 08/15/88 LER# 28088029 50.72#: 13196 POWER: 100  
DESC: HIGH AND LOW HEAD INJECTION WHEN TEST TERMINATE BUTTON WAS PUSHED.

**SCRAM** 08/15/88 LER# 28088029 50.72#: 13196 POWER: 100  
DESC: A RELAY FAILED DURING A PERIODIC TEST OF THE HIGH CONSEQUENCE LIMITING SAFEGUARD SYSTEM LEADING TO A SAFETY INJECTION SIGNAL AND A REACTOR TRIP.

**SSF** 09/12/88 LER# 28088031 50.72#: 13583 POWER: 0  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: POTENTIAL FOR INADEQUATE SERVICE WATER SUPPLY DURING A LOCA WITH A LOSS OF OFFSITE POWER. VARIOUS SCENARIOS, DESIGN DEFICIENCIES AND AN INCONSISTENCY BETWEEN TECH. SPECS. AND FSAR.

**SSF** 09/13/88 LER# 28088032 50.72#: 13447 POWER: 100  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: POTENTIAL FOR OVERLOADING EMERGENCY DIESEL GENERATORS DURING LOCA. ABSENCE OF LOAD SEQUENCING ON EMERGENCY BUSES. ALL THREE EDGS DECLARED INOPERABLE

**PI EVENTS FOR 88-4**

**SSF** 10/12/88 LER# 28088040 50.72#: 13688 POWER: 0  
SYSTEM: HIGH PRESSURE SAFETY INJECTION SYSTEM  
DESC: LICENSEE DETERMINED THAT POTENTIAL GAS ACCUMULATION IN SUCTION OF HPSI PUMP. VOIDING COULD EXCEED CAPACITY THAT PUMPS COULD HANDLE. DESIGN ERROR

**SSF** 11/02/88 LER# 28088033 50.72#: 13886 POWER: 0  
SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
DESC: DESIGN DEFICIENCY DISCOVERED. CONTROL ROOM HVAC UNITS DO NOT HAVE CAPABILITY TO MAINTAIN DESIGN TEMPERATURE DURING LOCA CONDITIONS WORST CASE ASSUMPTIONS.

**PI EVENTS FOR 89-1**

**SE** 01/26/89 LER# 50.72#: 14576 POWER: 0  
DESC: DEGRADED POWER CABLE INSULATION ON THE INSIDE RECIRC SPRAY PUMPS. EVENT INVOLVES UNIT 2 ALSO.

**SE** 01/31/89 LER# 50.72#: 13961 POWER: 0  
DESC: NUMEROUS MOVS AND OPERATORS HAD DEFICIENCIES MAKING THEM INOPERABLE. FOUND DURING ENGINEERING EVALUATION. NUMEROUS SAFETY SYSTEMS MAY HAVE BEEN INOPERABLE.

**SSA** 02/04/89 LER# 28089005 50.72#: 14652 POWER: 0  
DESC: LOSS OF POWER TO EMERGENCY BUSES WHEN CONDUCTING MAINTENANCE ON 'C' RESERVE TRANSFORMER DUE TO A FAILED 4160V BREAKER CAUSED THE DIESELS TO START AND LOAD THE 1H BUS.

**SSA** 02/08/89 LER# 28089006 50.72#: 14694 POWER: 0  
DESC: ESFAS LOGIC SIGNAL DUE TO DEENERGIZING A RELAY WHEN CONDUCTING A TEST CAUSED SI WHICH WAS NOT CORRECTLY IDENTIFIED IN THE PROCEDURE.

**SE** 03/10/89 LER# 28089008 50.72#: 14988 POWER: 0  
DESC: UNQUALIFIED SAFETY-RELATED PARTS SUPPLIED BY NON-ORIGINAL EQUIPMENT MANUFACTURER.

**SSF** 03/10/89 LER# 28089008 50.72#: 14988 POWER: 0  
SYSTEM: CONTAINMENT SPRAY SYSTEM  
DESC: AS A RESULT OF AN INSPECTION, A DETERMINATION WAS MADE THAT THE CONTAINMENT SPRAY PUMP'S REPLICATOR SHAFT SLEEVES DID NOT CONFORM TO SPECS AND WERE UNQUALIFIED FOR NUCLEAR SERVICE.

**SSF** 03/18/89 LER# 28089009 50.72#: 15051 POWER: 0  
SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
DESC: PERSONNEL ERROR RESULTED IN A LOSS OF RHR COOLING FOR ELEVEN HOURS. A SYSTEM CONFIGURATION CHANGE WAS MADE BUT CCW FLOW WAS NOT LINED UP THROUGH ONE HEAT EXCHANGER, AND RHR FLOW NOT PROVIDED TO OTHER HX.

TABLE 8.97 (CONT.)

SURRY 1 (CONT.)

PI EVENTS FOR 89-2

**SSA** 04/06/89 LER# 28089010 50.72#: 15227 POWER: 0  
 DESC: THE DIESEL GENERATOR RECEIVED A VALID BUS LOW VOLTAGE SIGNAL WHEN A LIGHTNING ARRESTOR FAILED AND INTERRUPTED POWER TO THE VITAL BUS. DG WAS IN EXERCISE MODE BUT WAS MANUALLY STARTED AND LOADED.

**SSA** 04/13/89 LER# 28089013 50.72#: 15322 POWER: 0  
 DESC: SUBSTATION PERSONNEL DIDN'T USE A PROCEDURE, MISSED A STEP WHILE TESTING THE NUMBER 3 BUS, AND CAUSED LOSS OF SEVERAL 4160V BUSES. ONE EDG WAS OOS FOR MAINTENANCE, 3 EDG STARTED AND LOADED.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.51	.00	.47	.00	.69	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	1	0	1	0	1	0	0	0
SAFETY SYSTEM ACTUATIONS	2	0	0	0	1	0	2	2
SIGNIFICANT EVENTS	0	0	0	1	0	0	3	0
SAFETY SYSTEM FAILURES	0	2	0	2	2	2	2	0
FORCED OUTAGE RATE (%)	6	13	4	0	26	100	100	100
EQUIP. FORCED OUTAGFS/1000 CRITICAL HOURS	1.02	1.03	.47	.00	.69	.00	.00	.00
CRITICAL HOURS	1954	1950	2119	194	1443	0	0	0
COLLECTIVE RADIATION EXPOSURE	28	65	37	352	116	287	118	NA
CAUSE CODES:								
ADMINISTRATIVE	1	2	1	4	6	2	4	NA
LICENSED OPERATOR	0	0	0	0	1	1	1	NA
OTHER PERSONNEL	1	1	3	6	2	4	3	NA
MAINTENANCE	7	13	7	11	10	8	5	NA
A) MAINT PERSONNEL	1	0	1	5	1	4	3	NA
B) SURV AND TEST	1	3	2	3	2	2	3	NA
C) EQUIPMENT	5	8	4	5	6	4	0	NA
D) POTENTIAL MAINT	4	9	0	2	6	2	0	NA
DESIGN/INSTALLATION/FABRICATION	4	2	2	2	4	3	1	NA
EQUIPMENT FAILURE	1	2	0	0	1	1	1	NA

**TABLE 8.98**

**SURRY 2**

**PI EVENTS FOR 88-3**

**SCRAM** 09/10/88 LER# 28188022 50.72#: 13424 POWER: 4  
DESC: PROBLEM DUE TO THE COMBINATION OF AN INADEQUATE PROCEDURE, A FAULTY VALVE POSITION LIMIT INDICATION, AND A FAST VALVE POSITION LIMITER LEAD TO TURBINE AND REACTOR TRIPS.

**SSF** 09/12/88 LER# 28088031 50.72#: 13583 POWER: 0  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: POTENTIAL FOR INADEQUATE SERVICE WATER SUPPLY DURING A LOCA WITH A LOSS OF OFFSITE POWER. VARIOUS SCENARIOS, DESIGN DEFICIENCIES AND AN INCONSISTENCY BETWEEN TECH. SPECS. AND FSAR.

**SSF** 09/13/88 LER# 28088032 50.72#: 13447 POWER: 0  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: POTENTIAL FOR OVERLOADING EMERGENCY DIESEL GENERATORS DURING LOCA. ABSENCE OF LOAD SEQUENCING ON EMERGENCY BUSES. ALL THREE EDGS DECLARED INOPERABLE

**SE** 09/26/88 LER# 50.72#: POWER: 0  
DESC: THINNING OF SAFETY-RELATED MAIN FEEDWATER AND OTHER PIPING OCCURRED MORE RAPIDLY THAN EXPECTED. (PN-11-87-42)

**PI EVENTS FOR 88-4**

**SSF** 10/07/88 LER# 28188024 50.72#: 13640 POWER: 0  
SYSTEM: CONTAINMENT SPRAY SYSTEM  
DESC: DURING DISASSEMBLY OF CONTAINMENT SPRAY PUMPS, DISCOVERED PIECES OF PUMP COMPONENTS AND OTHER SMALL DEBRIS. INVESTIGATION DETERMINED PUMPS WOULD START, BUT LONG TERM OPERATION COULD NOT BE ASSURED.

**SSF** 10/12/88 LER# 28088040 50.72#: 13688 POWER: 0  
SYSTEM: HIGH PRESSURE SAFETY INJECTION SYSTEM  
DESC: IN RESPONSE TO IE NOTICE 88-23, LICENSEE DETERMINED THAT POTENTIAL GAS ACCUMULATION IN SUCTION OF HPSI PUMP. VOIDING COULD EXCEED CAPACITY THAT PUMPS COULD HANDLE. DESIGN ERROR

**SSF** 11/02/88 LER# 28088033 50.72#: 13886 POWER: 0  
SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
DESC: DESIGN DEFICIENCY DISCOVERED. CONTROL ROOM HVAC UNITS DO NOT HAVE CAPABILITY TO MAINTAIN DESIGN TEMPERATURE DURING LOCA CONDITIONS WORST CASE ASSUMPTIONS.

**SE** 12/08/88 LER# 28188025 50.72#: 14180 POWER: 0  
DESC: "PIGGY BACK" VALVES POWERED FROM OPPOSITE TRAIN FROM LPSI PUMPS. THEREFORE A SINGLE FAILURE WOULD RESULT IN LOSS OF AN ECCS FLOW.

**SSF** 12/08/88 LER# 28188025 50.72#: 14180 POWER: 0  
SYSTEM: LOW PRESSURE SAFETY INJECTION SYSTEM  
DESC: 2 LPSI VALVES WERE DISCOVERED TO BE MIS-LABELED. THE AS-BUILT CONFIGURATION OF VALVES WAS REVERSED FROM THE STATION DRAWINGS. THIS CONDITION COULD HAVE RENDERED LPSI INOPERABLE IN RECIRCULATION MODE.

**PI EVENTS FOR 89-1**

**SSF** 01/05/89 LER# 28189001 50.72#: POWER: 0  
SYSTEM: SECONDARY CONTAINMENT/UNDETERMINED SYSTEM  
DESC: LOSS OF SECONDARY CONTAINMENT DURING REFUELING OPERATIONS DUE TO ADMINISTRATIVE CONTROL. A S/G SAFETY VALVE WAS REMOVED AND THE BLANK FLANGE INSTALLED TO SEAL THE OPENING WAS NOT PROPERLY INSTALLED.

**SE** 01/26/89 LER# 50.72#: 14576 POWER: 0  
DESC: DEGRADED POWER CABLE INSULATION ON THE INSIDE RECIRC SPRAY PUMPS. EVENT INVOLVES UNIT 1 ALSO.

**SE** 01/31/89 LER# 50.72#: 13961 POWER: 0  
DESC: NUMEROUS MOVES AND OPERATORS HAD DEFICIENCIES MAKING THEM INOPERABLE. FOUND DURING ENGINEERING EVALUATION. NUMEROUS SAFETY SYSTEMS MAY HAVE BEEN INOPERABLE.



TABLE 8.98 (CONT.)

SURRY 2 (CONT.)

PI EVENTS FOR 89-1 (CONT.)

**SSA** 02/04/89 LER# 28089005 50.72#: 14652 POWER: 0  
 DESC: LOSS OF POWER TO EMERGENCY BUSES WHEN CONDUCTING MAINTENANCE ON 'C' RESERVE TRANSFORMER DUE TO A FAILED 4160V BREAKER CAUSED THE DIESEL TO START AND LOAD THE 2J BUS.

**SE** 03/10/89 LER# 50.72#: 14988 POWER: 0  
 DESC: UNQUALIFIED SAFETY-RELATED PARTS SUPPLIED BY NON-ORIGINAL EQUIPMENT MANUFACTURER.

**SSF** 03/10/89 LER# 28089008 50.72#: 14988 POWER: 999  
 SYSTEM: CONTAINMENT SPRAY SYSTEM  
 DESC: AS A RESULT OF AN INSPECTION, A DETERMINATION WAS MADE THAT THE CONTAINMENT SPRAY PUMP'S REPLICATOR SHAFT SLEEVES DID NOT CONFORM TO SPECS AND WERE UNQUALIFIED FOR NUCLEAR SERVICE.

PI EVENTS FOR 89-2

**SSA** 04/06/89 LER# 28089010 50.72#: 15227 POWER: 0  
 DESC: FAILURE OF A LIGHTNING ARRESTOR RESULTED IN A LOSS OF THE 4160V VITAL BUS. THE DIESEL GENERATOR STARTED AND PICKED UP THE VITAL BUS.

**SSA** 04/13/89 LER# 28089013 50.72#: 15322 POWER: 0  
 DESC: SUBSTATION PERSONNEL DIDN'T USE A PROCEDURE, MISSED A STEP WHILE TESTING THE NUMBER 3 BUS, AND CAUSED LOSS OF SEVERAL 4160V BUSES. ONE EDG WAS OOS FOR MAINTENANCE, 3 EDG STARTED AND LOADED.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.81	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	1	0	0	0
TOTAL SCRAMS	0	0	0	1	1	0	0	0
SAFETY SYSTEM ACTUATIONS	0	0	1	1	0	0	1	2
SIGNIFICANT EVENTS	0	0	1	1	1	1	3	0
SAFETY SYSTEM FAILURES	0	0	0	0	2	4	2	0
FORCED OUTAGE RATE (%)	0	0	5	45	0	0	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.48	.81	.00	.00	.00	.00
CRITICAL HOURS	2208	1871	2080	1242	1706	0	0	0
COLLECTIVE RADIATION EXPOSURE	28	65	37	352	116	287	118	NA
CAUSE CODES:								
ADMINISTRATIVE	1	0	2	5	3	2	3	NA
LICENSED OPERATOR	0	0	0	1	1	1	0	NA
OTHER PERSONNEL	0	2	2	2	1	3	2	NA
MAINTENANCE	5	5	8	8	4	7	4	NA
A) MAINT PERSONNEL	0	1	1	2	0	4	4	NA
B) SURV AND TEST	1	1	1	1	1	1	1	NA
C) EQUIPMENT	4	2	5	6	3	3	0	NA
D) POTENTIAL MAINT	3	4	4	2	1	1	0	NA
DESIGN/INSTALLATION/FABRICATION	1	1	0	4	3	4	1	NA
EQUIPMENT FAILURE	1	1	1	1	0	1	1	NA

**TABLE 8.99**  
**SUSQUEHANNA 1**

**PI EVENTS FOR 88-3**

**SSF** 07/27/88 LER# 38788016 50.72#: 12992 POWER: 100  
 SYSTEM: MAIN STEAM ISOLATION VALVES  
 DESC: LICENSEE DISCOVERED A WIRING ERROR THAT COULD HAVE RESULTED IN A NON CONSERVATIVE SIGNAL BEING SENT TO THE MSIVS. SWITCHES WIRED IN REVERSE OF THEIR DESIGN. LOSS OF ABILITY TO PERFORM SAFETY FUNCTION.

**PI EVENTS FOR 88-4**

**SSF** 11/04/88 LER# 38788022 50.72#: 13912 POWER: 100  
 SYSTEM: HIGH PRESSURE COOLANT INJECTION SYSTEM  
 DESC: THE HPCI TURBINE TRIP LOGIC WAS MISTAKENLY DISABLED DUE TO A TECH. PULLING THE WRONG FUSE WHILE ATTEMPTING TO REMOVE UNIT 2 HPCI FROM SERVICE. HPCI RESTORED TO SERVICE IN APPROX. 1.5 HRS.

**PI EVENTS FOR 89-1**

**SCRAM** 01/04/89 LER# 38789001 50.72#: 14401 POWER: 60  
 DESC: OPERATORS INADVERTENTLY ISOLATED INSTRUMENT AIR TO CIRC WATER BASIN LEVEL INDICATION CAUSING LOSS OF CIRC WATER FLOW LOWERING CONDENSER VACUUM AND TURBINE TRIP SCRAM.

**SCRAM** 01/12/89 LER# 38789002 50.72#: 14476 POWER: 20  
 DESC: MFW DID NOT RESPOND TO MANUAL CONTROL DUE TO BEING PLACED IN SERVICE INCORRECTLY AND HIGH SG LEVEL AND TURBINE TRIP SCRAM RESULTED.

**PI EVENTS FOR 89-2**

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.52	.51	.00	.00	1.16	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	1	1	0	0	2	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	0	0
SIGNIFICANT EVENTS	1	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	0	0	0	1	1	1	0	0
FORCED OUTAGE RATE (%)	4	30	7	12	0	0	22	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.59	.00	.00	.51	.00	.00	1.16	.00
CRITICAL HOURS	1688	726	1909	1964	2208	2209	1721	539
COLLECTIVE RADIATION EXPOSURE	80	164	97	125	18	17	28	NA
CAUSE CODES:								
ADMINISTRATIVE	3	3	0	0	3	1	5	NA
LICENSED OPERATOR	1	0	0	0	0	0	2	NA
OTHER PERSONNEL	2	4	2	1	1	3	2	NA
MAINTENANCE	2	7	5	4	7	2	3	NA
A) MAINT PERSONNEL	2	0	1	0	1	0	2	NA
B) SURV AND TEST	0	4	1	2	2	2	0	NA
C) EQUIPMENT	0	2	0	2	4	0	0	NA
D) POTENTIAL MAINT	0	3	3	1	3	0	1	NA
DESIGN/INSTALLATION/FABRICATION	1	0	0	1	2	1	1	NA
EQUIPMENT FAILURE	0	0	0	0	1	0	1	NA

**TABLE 8.100**  
**SUSQUEHANNA 2**

**PI EVENTS FOR 88-3**

**SSF** 07/27/88 LER# 38788016 50.72#: 12989 POWER: 100  
 SYSTEM: MAIN STEAM ISOLATION VALVES  
 DESC: LICENSEE DISCOVERED A WIRING ERROR THAT COULD HAVE RESULTED IN A NON CONSERVATIVE SIGNAL BEING SENT TO THE MSIVS. SWITCHES WIRED IN REVERSE OF THEIR DESIGN. LOSS OF ABILITY TO PERFORM SAFETY FUNCTION.

**PI EVENTS FOR 88-4**

NONE

**PI EVENTS FOR 89-1**

**SSF** 01/18/89 LER# 38889001 50.72#: POWER: 100  
 SYSTEM: MAIN STEAM ISOLATION VALVES  
 DESC: MOTOR SPLICES ON 3 MSIV LEAKAGE CONTROL VALVES NOT QUALIFIED (EQ). SYSTEM MINIMIZES THE RELEASE OF FISSION PRODUCTS FOLLOWING A LOCA. SYSTEM DID NOT MEET TECH. SPEC. REQUIREMENTS FOR OPERABILITY.

**PI EVENTS FOR 89-2**

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	0	0	0	0	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	0	0
SIGNIFICANT EVENTS	0	0	1	0	0	0	0	0
SAFETY SYSTEM FAILURES	0	0	2	0	1	0	1	0
FORCED OUTAGE RATE (%)	0	0	0	4	0	0	7	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	4.08	.00	.45	.50	.00
CRITICAL HOURS	2208	2209	1560	245	2143	2209	1987	2183
COLLECTIVE RADIATION EXPOSURE	80	164	97	125	18	17	28	NA
CAUSE CODES:								
ADMINISTRATIVE	1	0	3	1	2	0	3	NA
LICENSED OPERATOR	0	0	0	0	0	0	0	NA
OTHER PERSONNEL	1	1	2	2	0	4	1	NA
MAINTENANCE	1	2	8	3	6	3	2	NA
A) MAINT PERSONNEL	1	0	4	1	0	1	1	NA
B) SURV AND TEST	0	1	2	0	4	0	0	NA
C) EQUIPMENT	0	0	0	2	2	2	0	NA
D) POTENTIAL MAINT	0	2	4	0	3	1	1	NA
DESIGN/INSTALLATION/FABRICATION	3	0	2	1	2	1	1	NA
EQUIPMENT FAILURE	0	0	0	0	1	0	2	NA

**TABLE 8.101**  
**THREE MILE ISL 1**

**PI EVENTS FOR 88-3**

NONE

**PI EVENTS FOR 88-4**

**SCRAM** 10/30/88 LER# 28988006 50.72#: 13854 POWER: 100  
DESC: A POWER SUPPLY FAILURE ON THE EHC CAUSED A TURBINE TRIP AND A REACTOR SCRAM ON HIGH RCS PRESSURE.

**PI EVENTS FOR 89-1**

NONE

**PI EVENTS FOR 89-2**

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.46	.00	.09	.00	.00	.54	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	1	0	0	0	0	1	0	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	0	0
SIGNIFICANT EVENTS	0	0	1	0	0	0	0	0
SAFETY SYSTEM FAILURES	0	0	0	0	0	0	0	0
FORCED OUTAGE RATE (%)	1	0	3	0	19	18	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.46	.00	.47	.00	1.07	1.63	.00	.00
CRITICAL HOURS	2197	2209	2122	1869	932	1837	2160	2183
COLLECTIVE RADIATION EXPOSURE	17	12	12	63	116	20	12	NA
CAUSE CODES:								
ADMINISTRATIVE	1	0	0	1	4	0	0	NA
LICENSED OPERATOR	1	0	0	0	2	0	0	NA
OTHER PERSONNEL	1	0	0	1	0	0	0	NA
MAINTENANCE	2	0	0	1	2	1	0	NA
A) MAINT PERSONNEL	0	0	0	0	0	0	0	NA
B) SURV AND TEST	2	0	0	1	2	0	0	NA
C) EQUIPMENT	0	0	0	0	0	1	0	NA
D) POTENTIAL MAINT	0	0	0	0	0	1	0	NA
DESIGN/INSTALLATION/FABRICATION	0	0	1	0	0	0	0	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

TABLE 8.102

TROJAN

PI EVENTS FOR 88-3

**SSA** 07/04/88 LER# 34488022 50.72#: 12715 POWER: 0  
DESC: BOTH HIGH HEAD CENTRIFUGAL PUMPS RAISED PZR LEVEL 20% ON A SPURIOUS LOW PZR PRESSURE SIGNAL. LER STATES SI PUMPS IN PULL-TO-LOCK SO NO INJECTION OCCURRED.

**SSF** 07/22/88 LER# 34488024 50.72#: POWER: 100  
SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
DESC: BOTH TRAINS OF THE CONTROL ROOM EMERGENCY VENTILATION SYSTEM INOPERABLE AT THE SAME TIME. A SUPPLY FAN FAILED TO SHUT DOWN, ACTION STATEMENT OF TECH. SPEC. COULD NOT BE MET.

**SCRAM** 08/16/88 LER# 34488026 50.72#: 13214 POWER: 100  
DESC: LOW RCS FLOW SIGNAL DURING TESTING DUE TO AN INADEQUATE PROCEDURE THAT DID NOT IDENTIFY HOW TO VENT COMMON SENSING LINES CAUSED A LOW REACTOR COOLANT FLOW SIGNAL AND A REACTOR TRIP.

**SE** 09/16/88 LER# 50.72#: 13480 POWER: 100  
DESC: SAFETY INJECTION SYSTEM RENDERED INOPERABLE DUE TO MAINTENANCE. INTRUSION OF CLAMS IN SERVICE WATER SYSTEM AND RX TRIP DUE TO PERSONNEL ERROR.

**SCRAM** 09/16/88 LER# 34488028 50.72#: 13467 POWER: 100  
DESC: PROCEDURE DIRECTED I&C TECH TO WRONG PRESSURE TRANSMITTER CAUSING OVERTEMP DELTA TEMP. AN INCORRECT PROCEDURE ALONG WITH PERSONNEL ERROR CAUSED A REACTOR TRIP WHEN AN I&C TECHNICIAN TRIPPED THE WRONG BISTABLE CAUSING AN OVER TEMP DELTA TEMP TRIP.

**SSF** 09/17/88 LER# 34488029 50.72#: 13480 POWER: 0  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: CLAMS DISCOVERED IN SEVICE WATER SYSTEM THAT COULD AFFECT COMPONENT OPERABILITY. SYSTEMS AFFECTED: COMPONENT COOLING WATER, AFW, HPSI, EDG, SAFETY RELATED ROOM COOLERS. FLUSHING AND INSPECTION IMPLEMENTED.

**SSF** 09/24/88 LER# 34488032 50.72#: POWER: 89  
SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
DESC: CONTROL ROOM EMERG. VENTILATION SYSTEM INOP. DUE TO INABILITY TO MAINTAIN SUFFICIENT POS. PRESS. IN CONTROL ROOM. FAILED SECURITY LATCH ON DOOR ALLOWED AIR TO BE DRAWN FROM CONTROL ROOM TO AUX. BLD.

PI EVENTS FOR 88-4

**SCRAM** 11/13/88 LER# 34488043 50.72#: 13974 POWER: 100  
DESC: "B" FPV FAILED OPEN CAUSING A HIGH SG LEVEL, A TURBINE TRIP, AND A REACTOR TRIP.

PI EVENTS FOR 89-1

NONE

PI EVENTS FOR 89-2

**SSF** 04/08/89 LER# 50.72#: 15260 POWER: 0  
SYSTEM: CONTAINMENT SPRAY SYSTEM  
DESC: CONTAINMENT SPRAY SYSTEM DECLARED INOPERABLE DUE TO SEISMIC CONSIDERATIONS. SYSTEM PIPING NOT MOUNTED ACCORDING TO PLANT DRAWINGS.

**SSF** 04/08/89 LER# 50.72#: 15260 POWER: 0  
SYSTEM: CONTAINMENT FAN COOLING SYSTEM  
DESC: CONTAINMENT COOLERS DECLARED INOPERABLE DUE TO SEISMIC CONSIDERATIONS. SYSTEM PIPING NOT MOUNTED ACCORDING TO PLANT DRAWINGS.

**SE** 04/09/89 LER# 50.72#: 15268 POWER: 0  
DESC: INOPERABLE RHR ISOLATION VALVE DUE TO WIRING ERROR. RESULTS IN DEGRADATION OF PRESSURE BOUNDARY PROTECTION.

TABLE 8.102 (CONT.)

TROJAN (CONT.)

PJ EVENTS FOR 89-2 (CONT.)

**SSF** 04/21/89 LER# 34489008 50.72#: 15405 POWER: 0  
 SYSTEM: FUEL BUILDING ENVIRONMENTAL CONTROL SYSTEM  
 DESC: THE SPENT FUEL EXHAUST SYSTEM WAS RENDERED INOPERABLE (5-10 MINS.) WHILE FUEL WAS BEING MOVED. THE BUILDING DIFFERENTIAL PRESSURE DID NOT MEET T.S. REQUIREMENTS WHEN A DOOR WAS PROPPED OPEN. CAUSED BY LACK OF ADMINISTRATIVE CONTROLS.

**SSF** 06/02/89 LER# 34489012 50.72#: POWER: 0  
 SYSTEM: CONTROL BUILDING/CONTROL COMPLEX ENVIRONMENTAL CONTROL SYSTEM  
 DESC: BOTH TRAINS OF THE CONTROL ROOM EMERGENCY VENTILATION SYSTEM WERE DECLARED INOPERABLE. SOME DUCT SUPPORT HANGERS DO NOT MATCH DESIGN CONFIGURATION. INCORRECT CONFIGURATION ORIGINALLY NOTED BY NRC TEAM INSPECTION.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.18	.00	.49	.00	1.11	.56	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	1	0	1	0	2	1	0	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	1	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	1	0	0	1
SAFETY SYSTEM FAILURES	0	1	0	2	3	0	0	4
FORCED OUTAGE RATE (%)	7	22	6	0	10	20	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	1.15	.49	.00	1.11	.56	.00	.00
CRITICAL HOURS	845	1736	2057	287	1803	1778	2160	120
COLLECTIVE RADIATION EXPOSURE	18	11	10	346	12	33	7	NA
CAUSE CODES:								
ADMINISTRATIVE	3	3	4	8	3	4	3	NA
LICENSED OPERATOR	2	0	0	0	0	1	0	NA
OTHER PERSONNEL	2	2	2	5	7	4	2	NA
MAINTENANCE	6	8	5	9	12	10	4	NA
A) MAINT PERSONNEL	0	0	2	2	4	1	1	NA
B) SURV AND TEST	3	4	3	6	4	7	3	NA
C) EQUIPMENT	1	3	1	2	4	2	0	NA
D) POTENTIAL MAINT	3	2	1	0	5	4	0	NA
DESIGN/INSTALLATION/FABRICATION	1	1	0	1	2	2	2	NA
EQUIPMENT FAILURE	0	0	0	0	0	1	0	NA

**TABLE 8.103  
TURKEY POINT 3**

**PI EVENTS FOR 88-3**

**SSF** 08/22/88 LER# 25088018 50.72#: 13256 POWER: 100  
SYSTEM: ENGINEERED SAFETY FEATURES ACTUATION SYSTEM  
DESC: POTENTIAL LOSS OF BOTH TRAINS OF CONTAINMENT SPRAY,RHR, AND 2/4 SI PUMPS IF AN ACCIDENT WAS TO OCCUR DURING PERFORMANCE OF THE MONTHLY ECCS VALVE CYCLING PROCEDURE. PROCEDURE IN ERROR.

**SSF** 09/13/88 LER# 25088021 50.72#: POWER: 100  
SYSTEM: LOW TEMPERATURE/OVERPRESSURE SYSTEM  
DESC: STROKE TIME OF PORVS (LTOP) EXCEEDED THE AS SPECIFIED TECH.SPEC. BASIS EVALUATION TIME. DESIGN BASIS OPENING TIME WAS NOT MET. INADEQUATE DESIGN REVIEW PROCESS.

**SSF** 09/20/88 LER# 25088022 50.72#: 13720 POWER: 100  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: THE "B" DIESEL GENERATOR WAS OUT OF SERVICE FOR PLANNED MAINTENANCE. THE "A" DIESEL GENERATOR WAS DECLARED OOS DUE TO EXCESSIVE FUEL INLET PRESSURE. FILTER REPLACEMENT INTERVAL HAS BEEN SHORTENED.

**PI EVENTS FOR 88-4**

**SSF** 10/13/88 LER# 25088025 50.72#: POWER: 0  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: A POTENTIAL INTERACTION BETWEEN THE EDG SEQUENCER AND ESW SYSTEM DISCOVERED. IF "A" TRAIN ESW TRIPPED AND "B" TRAIN WAS ALREADY RUNNING, "C" TRAIN ESW PUMP WOULD START AND OVERLOAD EDG.

**PI EVENTS FOR 89-1**

**SSF** 01/10/89 LER# 25089001 50.72#: 14455 POWER: 0  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: AN EMERGENCY SOURCE OF POWER WAS NOT AVAILABLE TO THE RHR SYSTEM. "B" EDG WAS INOPERABLE FOR TESTING WHEN THE 3A INTAKE COOLING WATER PUMP WAS SECURED (THOUGHT IT HAD A PROBLEM).

**SE** 01/16/89 LER# 50.72#: 14512 POWER: 0  
DESC: LICENSEE FOUND LEAKS IN 3 REACTOR CORE THIMBLE GUIDE TUBES.

**SCRAM** 02/10/89 LER# 25089004 50.72#: 14714 POWER: 0  
DESC: INADEQUATE PROCEDURE DID NOT IDENTIFY PROBLEM WHEN TESTING TURBINE ONLINE OR OFFLINE CAUSING THE SCRAM WHILE THE REACTOR WAS CRITICAL.

**PI EVENTS FOR 89-2**

**SSA** 06/16/89 LER# 50.72#: 15892 POWER: 0  
DESC: ESF SAFEGUARDS SIGNAL CAUSED ECCS START SIGNAL, BUT NO WATER WAS INJECTED.

**SSA** 06/17/89 LER# 25089011 50.72#: 15894 POWER: 0  
DESC: INADEQUATE LABELING OF BLOCK/UNBLOCK SWITCH CAUSED ESF SAFEGUARDS TRAIN 'A' TO ACTUATE CAUSING ECCS BUT NO WATER WAS INJECTED.

**TABLE 3.103 (CONT.)**  
**TURKEY POINT 3 (CONT.)**

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	.00	.00	.00
SCRAMS < 15% POWER	1	0	0	0	0	0	1	0
TOTAL SCRAMS	1	0	0	0	0	0	1	0
SAFETY SYSTEM ACTUATIONS	2	0	0	0	0	0	0	2
SIGNIFICANT EVENTS	0	0	0	0	0	0	1	0
SAFETY SYSTEM FAILURES	1	1	0	2	3	1	1	0
FORCED OUTAGE RATE (%)	77	94	58	0	0	99	45	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	6.27	18.47	3.02	.00	.00	92.17	.81	.00
CRITICAL HOURS	319	162	995	2183	2208	22	1231	167
COLLECTIVE RADIATION EXPOSURE	83	48	52	26	30	228	116	NA
CAUSE CODES:								
ADMINISTRATIVE	6	4	3	2	7	3	3	NA
LICENSED OPERATOR	3	1	2	0	2	0	0	NA
OTHER PERSONNEL	4	2	2	4	2	2	2	NA
MAINTENANCE	7	8	5	7	9	3	5	NA
A) MAINT PERSONNEL	4	3	2	1	3	1	0	NA
B) SURV AND TEST	5	3	1	5	5	2	3	NA
C) EQUIPMENT	2	4	2	1	1	0	1	NA
D) POTENTIAL MAINT	1	4	2	2	2	0	2	NA
DESIGN/INSTALLATION/FABRICATION	3	1	1	1	5	4	3	NA
EQUIPMENT FAILURE	0	0	0	0	1	0	0	NA



**TABLE 8.104  
TURKEY POINT 4**

**PI EVENTS FOR 88-3**

**SCRAM** 08/19/88 LER# 25188010 50.72#: 13246 POWER: 100  
DESC: REACTOR TRIPPED ON LOW SG LEVEL. THIS WAS DUE TO PERSONNEL ERROR IN THAT THE OPERATOR SELECTED THE WRONG CHANNEL FOR TESTING. THE FEEDWATER REGULATING VALVE WAS DRIVEN SHUT.

**SSF** 08/22/88 LER# 25088018 50.72#: 13256 POWER: 65  
SYSTEM: ENGINEERED SAFETY FEATURES ACTUATION SYSTEM  
DESC: POTENTIAL LOSS OF BOTH TRAINS OF CONTAINMENT SPRAY, RHR, AND 2/4 SI PUMPS IF AN ACCIDENT WAS TO OCCUR DURING PERFORMANCE OF THE MONTHLY ECCS VALVE CYCLING PROCEDURE. PROCEDURE IN ERROR.

**SSF** 09/13/88 LER# 25088021 50.72#: POWER: 100  
SYSTEM: LOW TEMPERATURE/OVERPRESSURE SYSTEM  
DESC: STROKE TIME OF PORVS (LTOP) EXCEEDED THE AS SPECIFIED TECH.SPEC. BASIS EVALUATION TIME. DESIGN BASIS OPENING TIME WAS NOT MET. INADEQUATE DESIGN REVIEW PROCESS.

**PI EVENTS FOR 88-4**

**SSF** 10/13/88 LER# 25088025 50.72#: POWER: 0  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: A POTENTIAL INTERACTION BETWEEN THE EDG SEQUENCER AND ESW SYSTEM DISCOVERED. IF "A" TRAIN ESW TRIPPED AND "B" TRAIN WAS ALREADY RUNNING, "C" TRAIN ESW PUMP WOULD START AND OVERLOAD EDG.

**PI EVENTS FOR 89-1**

**SSF** 02/09/89 LER# 25189001 50.72#: 14704 POWER: 0  
SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
DESC: RHR PUMP "4A" (THE ONLY OPERABLE RHR PUMP) WAS RENDERED TECHNICALLY INOPERABLE WHEN ITS EMERGENCY EDG WAS TESTED. CAUSED BY MISCOMMUNICATION BETWEEN OPERATIONS PERSONNEL.

**PI EVENTS FOR 89-2**

**SSA** 04/12/89 LER# 25189002 50.72#: 15304 POWER: 0  
DESC: THE INCORRECT PROCEDURE WAS USED TO RE-INSTALL FUSES IN THE SAFEGUARDS RACKS. THIS CAUSED AN ACTUATION OF SI PUMPS, DIESEL GENERATOR, AUXILIARY FEED, AND INTAKE CHILLED WATER PUMPS.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.55	.00	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	0	1	0	0	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	0	1
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	1	2	1	2	2	1	1	0
FORCED OUTAGE RATE (%)	16	57	19	35	3	0	0	7
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	1.01	.00	.56	1.36	.55	.00	.00	1.78
CRITICAL HOURS	1980	971	1780	1466	1804	0	0	562
COLLECTIVE RADIATION EXPOSURE	83	48	52	26	30	228	116	NA
CAUSE CODES:								
ADMINISTRATIVE	6	4	2	2	4	3	1	NA
LICENSED OPERATOR	3	0	1	0	4	0	0	NA
OTHER PERSONNEL	4	2	1	5	0	1	0	NA
MAINTENANCE	9	6	3	9	11	2	3	NA
A) MAINT PERSONNEL	4	3	1	1	1	1	0	NA
B) SURV AND TEST	5	2	1	6	5	1	1	NA
C) EQUIPMENT	3	3	1	3	3	0	1	NA
D) POTENTIAL MAINT	4	3	1	3	6	0	2	NA
DESIGN/INSTALLATION/FABRICATION	4	2	1	0	3	3	2	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

**TABLE 8.105**  
**VERMONT YANKEE**

**PI EVENTS FOR 88-3**

**SCRAM** 07/03/88 LER# 27188009 50.72#: 12714 POWER: 1  
DESC: MECHANICAL PRESSURE REGULATOR PROBLEMS DUE TO DIRTY CONTROL OIL CAUSED REACTOR PRESSURE AND LEVEL OSCILLATIONS WHICH LEAD TO A HIGH FLUX SIGNAL FOLLOWED BY A REACTOR TRIP.

**SE** 09/28/88 LER# 50.72#: POWER: 0  
DESC: WIRING ERROR IN THE POWER SUPPLY FOR THE FIRE DETECTION AND CARBON DIOXIDE FIRE SYSTEM MAKING THEM INOPERABLE. (MORNING REPORT: 09/29/88)

**PI EVENTS FOR 88-4**

NONE

**PI EVENTS FOR 89-1**

**SSF** 01/04/89 LER# 27189001 50.72#: 14409 POWER: 90  
SYSTEM: REACTOR BUILDING  
DESC: RTR BUILDING RAILROAD ACCESS DOOR SEALS ARE SUPPLIED WITH NON-SAFETY, NON-SEISMIC INSTRUMENT AIR. TEMPORARY PASSIVE SEALS WERE INSTALLED AND LATER DISCOVERED TO HAVE DEPRESSURIZED WITH OUTER DOOR OPEN.

**SSA** 03/10/89 LER# 27189015 50.72#: 14990 POWER: 0  
DESC: ECCS INITIATION SIGNAL WHEN REENERGIZING AN ECCS INITIATION CABINET - CAUSED 'B' DIESEL, 'B' RHR, RCIC, AND HPCI TO RECEIVE INITIATION SIGNALS.

**SSF** 03/10/89 LER# 27189013 50.72#: 14986 POWER: 0  
SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
DESC: REACTOR VESSEL WATER INVENTORY WAS LOST DUE TO RACKING OUT OF RHR SUCTION VALVES WHICH CAUSED THE MINIMUM FLOW BYPASS VALVE TO OPEN, CREATING A FLOW PATH TO THE SUPPRESSION POOL WITH THE OTHER RHR TRAIN ON-LINE FOR SHUTDOWN HEAT REMOVAL.

**SSA** 03/30/89 LER# 27189016 50.72#: 15162 POWER: 0  
DESC: PROCEDURE DID NOT ADDRESS THAT CORE SPRAY PUMPS OR RHR WOULD ACTUATE WHEN TESTING HIGH DRYWELL PRESSURE.

**SSF** 03/31/89 LER# 27189017 50.72#: 15164 POWER: 0  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: CHECK VALVES IN BOTH TRAINS OF THE ESSENTIAL SERVICE WATER SYSTEM WERE FOUND STUCK OPEN BECAUSE OF MICROBIAL INDUCED INTERNAL CORROSION FROM AEROBIC BACTERIA. THE SYSTEMS COULD NOT FULFILL THEIR SAFETY FUNCTION UNDER CERTAIN CONDITIONS.

**PI EVENTS FOR 89-2**

**SSF** 06/07/89 LER# 50.72#: 15796 POWER: 92  
SYSTEM: REACTOR CORE ISOLATION COOLING SYSTEM  
DESC: THE RCIC SYSTEM WAS DECLARED INOPERABLE WHEN DURING A MONTHLY SURVEILLANCE TEST OF THE RCIC SYSTEM THE RCIC PUMP DISCHARGE VALVE BREAKER TRIPPED TWICE WHILE STROKING THE VALVE CLOSED. THE CAUSE IS UNDER INVESTIGATION.

**SSF** 06/28/89 LER# 50.72#: 15981 POWER: 100  
SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
DESC: A DESIGN ERROR WAS DISCOVERED IN THE POWER SUPPLIES TO THE RHR SERVICE WATER OUTLET VALVES. POTENTIAL FOR A LOSS OF SERVICE WATER TO BOTH RHR TRAINS DURING A DBA WITH LOSS OF OFFSITE POWER.

**TABLE 8.105 (CONT.)**  
**VERMONT YANKEE (CONT.)**

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.94	.00	.99	.00	.00	.00	.00
SCRAMS < 15% POWER	1	0	0	0	1	0	0	0
TOTAL SCRAMS	1	2	0	2	1	0	0	0
SAFETY SYSTEM ACTUATIONS	1	0	0	0	0	0	2	0
SIGNIFICANT EVENTS	0	0	0	0	1	0	0	0
SAFETY SYSTEM FAILURES	0	2	1	0	0	0	3	2
FORCED OUTAGE RATE (%)	0	4	0	1	11	0	0	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.00	.99	1.00	.00	.00	.00
CRITICAL HOURS	910	2122	2184	2017	1994	2209	985	2014
COLLECTIVE RADIATION EXPOSURE	228	24	32	24	31	38	194	NA
CAUSE CODES:								
ADMINISTRATIVE	7	3	2	1	2	2	7	NA
LICENSED OPERATOR	0	0	0	0	0	0	1	NA
OTHER PERSONNEL	2	2	0	2	1	1	2	NA
MAINTENANCE	10	5	3	4	1	3	11	NA
A) MAINT PERSONNEL	2	2	0	1	0	0	3	NA
B) SURV AND TEST	6	2	1	1	0	3	5	NA
C) EQUIPMENT	2	0	2	2	1	1	2	NA
D) POTENTIAL MAINT	2	1	1	2	1	0	2	NA
DESIGN/INSTALLATION/FABRICATION	2	0	0	0	1	1	2	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

TABLE E.106

VOGTLE 1

PI EVENTS FOR 88-3

**SCRAM** 07/14/88 LER# 42488022 50.72#: 12833 POWER: 100  
DESC: OVERVOLTAGE/OVEREXCITATION ON MAIN GENERATOR CAUSED TURBINE TRIP SCRAM DUE TO FAILURE OF RELAY/METERING POTENTIAL TRANSFORMER.

**SCRAM** 07/30/88 LER# 42488024 50.72#: 13043 POWER: 100  
DESC: MAIN GENERATOR DISCONNECT FAILED DUE TO CRACK ON TERMINAL PAD CAUSING TURBINE TRIP REACTOR TRIP.

**SCRAM** 07/31/88 LER# 42488025 50.72#: 13049 POWER: 16  
DESC: LIGHTNING STRIKE STRUCK CONTAINMENT AND AUXILIARY BUILDING CAUSING DISTURBANCE ON W'S AND CAUSING LOSS OF POWER TO CRD'S CAUSING RODS TO DROP CAUSING SCRAM ON NEGATIVE RATE FLUX.

PI EVENTS FOR 88-4

**SSA** 10/16/88 LER# 42488028 50.72#: 13730 POWER: 0  
DESC: SYSTEM ENGINEER FAILED TO COMPLETE PREREQUISITE FOR A SI TEST CAUSING INADVERTENT SI.

PI EVENTS FOR 89-1

**SSF** 01/06/89 LER# 42489002 50.72#: 14429 POWER: 100  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: IMPROPER FUSES MAY HAVE PREVENTED FULFILLMENT OF A SAFETY SYSTEM FUNCTION. WRONG SIZE FUSES IN THE ESW CONTROL CIRCUIT. INVESTIGATING IF FUSES SUPPLIED BY ORIGINAL VENDOR.

**SSF** 03/06/89 LER# 42587081 50.72#: POWER: 75  
SYSTEM: HIGH PRESSURE SAFETY INJECTION SYSTEM  
DESC: THE HPSI SYSTEM MAY NOT PERFORM ITS REQUIRED SAFETY FUNCTION DURING A DESIGN BASIS EVENT DUE TO INCORRECT VALVE WEIGHT AND FAILURE POINT LOCATION INFO USED FOR SUPPORT PLACEMENT, WHICH COULD HAVE DRAINED THE RWST BELOW MIN RQMTS FOR A PLANT SHUTDOWN.

**SSF** 03/19/89 LER# 42589011 50.72#: POWER: 0  
SYSTEM: LOW PRESSURE SAFETY INJECTION SYSTEM  
DESC: IT WAS FOUND DURING PROCEDURE REVIEW THAT THE LPSI WAS ISOLATED IN MODE 3 TO FILL ACCUMULATORS WHICH VIOLATES T.S. REQUIREMENTS FOR SYSTEM OPERABILITY DURING THIS MODE. ISOLATION WAS CAUSED BY SHUTTING THE SI PUMP COLD LEG INJECTION VALVE TO THE RCS.

PI EVENTS FOR 89-2

**SCRAM** 05/09/89 LER# 50.72#: 15581 POWER: 100  
DESC: MFP TRIPPED ON HIGH VIBRATION AND OPERATORS NOT ABLE TO RECOVER SG LEVEL AND A SCRAM OCCURRED TWO MINUTES AFTER MFP TRIP.

TABLE 8.106 (CONT.)

## VOGTLE 1 (CONT.)

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.44	1.22	1.23	.48	1.40	.00	.00	.46
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	3	2	2	1	3	0	0	1
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	1	0	0
SIGNIFICANT EVENTS	0	0	1	0	0	0	0	0
SAFETY SYSTEM FAILURES	2	1	0	1	0	0	3	0
FORCED OUTAGE RATE (%)	7	18	26	6	5	9	12	3
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.61	1.23	.97	.93	2.03	1.03	.46
CRITICAL HOURS	2081	1642	1620	2069	2148	985	1944	2172
COLLECTIVE RADIATION EXPOSURE	NA	NA	NA	NA	NA	NA	11	NA
CAUSE CODES:								
ADMINISTRATIVE	2	10	4	7	3	5	4	NA
LICENSED OPERATOR	0	3	2	0	0	1	1	NA
OTHER PERSONNEL	11	1	3	0	3	7	6	NA
MAINTENANCE	11	11	8	8	7	11	9	NA
A) MAINT PERSONNEL	3	2	1	1	2	3	2	NA
B) SURV AND TEST	8	9	6	6	3	6	6	NA
C) EQUIPMENT	1	1	1	1	2	3	5	NA
D) POTENTIAL MAINT	1	2	2	1	1	2	2	NA
DESIGN/INSTALLATION/FABRICATION	5	5	0	5	2	5	1	NA
EQUIPMENT FAILURE	0	0	0	0	1	0	1	NA

TABLE 8.107

VOGTLE 2

PI EVENTS FOR 88-3

NONE

PI EVENTS FOR 88-4

NONE

PI EVENTS FOR 89-1

**SE** 03/09/89 LER# 50.72#: 14982 POWER: 0  
DESC: TWO RHR COLD LEG INJECTION VALVES FAILED WITH A FLOW PATH TO RWST OPEN.

**SSF** 03/09/89 LER# 42589003 50.72#: POWER: 0  
SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
DESC: THE SS DECIDED, WITHOUT AN APPROVED PROCEDURE, TO DEPRESSURIZE THE RHR SYSTEM USING THE RHR TEST RETURN VALVES. IF RHR WOULD HAVE BEEN NEEDED SOME OF THE FLOW WOULD HAVE BEEN DIVERTED TO THE RWST. CONDITION EXISTED APPROX. 14 HRS., TS 3.0.3 ENTERED.

**SSA** 03/18/89 LER# 42589006 50.72#: 15055 POWER: 0  
DESC: MAIN STEAMLINE LOW PRESSURE SIGNAL BECAME UNBLOCKED CAUSING SI AND INJECTION DUE TO AN OPERATOR RESETTING THE WRONG SWITCH.

**SSF** 03/19/89 LER# 42589011 50.72#: POWER: 0  
SYSTEM: LOW PRESSURE SAFETY INJECTION SYSTEM  
DESC: IT WAS FOUND DURING PROCEDURE REVIEW THAT THE LPSI WAS ISOLATED IN MODE 3 TO FILL ACCUMULATORS WHICH VIOLATES T.S. REQUIREMENTS FOR SYSTEM OPERABILITY DURING THIS MODE. ISOLATION WAS CAUSED BY SHUTTING THE SI PUMP COLD LEG INJECTION VALVE TO THE RCS.

PI EVENTS FOR 89-2

**SCRAM** 05/02/89 LER# 42589019 50.72#: 15508 POWER: 60  
DESC: WHILE INVESTIGATING A TEST MALFUNCTION ALARM A TURBINE TRIP AND SUBSEQUENT REACTOR TRIP OCCURRED POSSIBLY DUE TO A LEAKY WELD WHICH CAUSED CONDENSATION TO INITIATE THE TURBINE TRIP.

**SCRAM** 05/12/89 LER# 42589020 50.72#: 15606 POWER: 78  
DESC: ELECTRICAL FAILURE TO MI'S DURING TESTING CAUSED A HIGH FLUX SCRAM ON 2 OF 4 RATE TRIPS.

**SCRAM** 05/22/89 LER# 42589021 50.72#: 15681 POWER: 12  
DESC: CONTROL POWER TO TURBINE INTERCEPT VALVES CHANGED (.1 VOLTS) AFFECTED BIAS ON LOGIC CARD AND VALVE WOULD NOT OPEN CAUSING SCRAM ON LOW SG LEVEL WHEN MS<sub>2</sub> RELIEF LIFTED WHEN PLACING TURBINE ON LINE.

TYPE	87-3	87-4	38-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	NA	NA	NA	NA	NA	NA	.00	1.12
SCRAMS < 15% POWER	NA	NA	NA	NA	NA	NA	0	1
TOTAL SCRAMS	NA	NA	NA	NA	NA	NA	0	3
SAFETY SYSTEM ACTUATIONS	NA	NA	NA	NA	NA	NA	1	0
SIGNIFICANT EVENTS	NA	NA	NA	NA	NA	NA	1	0
SAFETY SYSTEM FAILURES	NA	NA	NA	NA	NA	NA	2	0
FORCED OUTAGE RATE (%)	NA	NA	NA	NA	NA	NA	NA	4
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	NA	NA	NA	NA	NA	NA	NA	1.12
CRITICAL HOURS	NA	NA	NA	NA	NA	NA	83	1793
COLLECTIVE RADIATION EXPOSURE	NA	NA	NA	NA	NA	NA	NA	NA
CAUSE CODES:								
ADMINISTRATIVE	NA	NA	NA	NA	NA	NA	3	NA
LICENSED OPERATOR	NA	NA	NA	NA	NA	NA	4	NA
OTHER PERSONNEL	NA	NA	NA	NA	NA	NA	4	NA
MAINTENANCE	NA	NA	NA	NA	NA	NA	8	NA
A) MAINT PERSONNEL	NA	NA	NA	NA	NA	NA	3	NA
B) SURV AND TEST	NA	NA	NA	NA	NA	NA	2	NA
C) EQUIPMENT	NA	NA	NA	NA	NA	NA	2	NA
D) POTENTIAL MAINT	NA	NA	NA	NA	NA	NA	1	NA
DESIGN/INSTALLATION/FABRICATION	NA	NA	NA	NA	NA	NA	1	NA
EQUIPMENT FAILURE	NA	NA	NA	NA	NA	NA	1	NA

TABLE 8.108  
WASH. NUCLEAR 2

PI EVENTS FOR 88-3

**SE** 09/09/88 LER# 50.72#: POWER: 0  
DESC: DURING CONTAINMENT INERTING AND NITROGEN SUPPLY TANK REFILLING OPERATIONS LIQUID N2 PASSED THROUGH CONTAINMENT PURGE SYSTEM PIPING AND THE PURGE SYSTEM LINE RUPTURED WHERE IT CONNECTS THE NITROGEN LINE. (MORNING REPORT: 09/12/88)

PI EVENTS FOR 88-4

NONE

PI EVENTS FOR 89-1

**SSF** 01/12/89 LER# 39789001 50.72#: 14470 POWER: 61  
SYSTEM: EMERGENCY ONSITE POWER SUPPLY SYSTEM  
DESC: FOUR FAILURE MODES WERE DISCOVERED OF THE CONTAINMENT INERTING SYSTEM, WHICH COULD RENDER SAFETY RELATED EQUIPMENT INOPERABLE. LIQUID NITROGEN COULD ENTER OTHER SYSTEMS. POTENTIAL TO STARVE EDGS OF OXYGEN.

**SSA** 01/30/89 LER# 39789002 50.72#: 14591 POWER: 100  
DESC: INAPPROPRIATE INSULATORS ON MAIN TRANSFORMER CAUSED VOLTAGE TRANSIENT AND MAIN TURBINE TRIP AND DIESEL START.

**SCRAM** 01/30/89 LER# 39789002 50.72#: 14591 POWER: 100  
DESC: FLASH IN TRANSFORMER YARD DUE TO INSULATOR FAILURE CAUSED THE LOCKOUT RELAY OF THE MAIN SETUP TRANSFORMER TO ACTUATE CAUSING TURBINE TRIP SCRAM.

PI EVENTS FOR 89-2

**SSF** 05/05/89 LER# 39789022 50.72#: POWER: 0  
SYSTEM: SECONDARY CONTAINMENT/UNDETERMINED SYSTEM  
DESC: LOSS OF SECONDARY CONTAINMENT INTEGRITY DURING CORE ALTERATIONS DUE TO UNISOLABLE LINES CAUSED BY POOR MAINTENANCE ACTIVITY SCHEDULING.

**SSA** 05/14/89 LER# 39789016 50.72#: 15616 POWER: 0  
DESC: OPERATOR PULLED FUSES IN SU TRANSFORMER VOLTAGE MONITOR CAUSING LOSS OF POWER TO BUS SM-7 AND DIESEL START AND LOAD.

**SSF** 05/27/89 LER# 39789020 50.72#: 15725 POWER: 0  
SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
DESC: THE RHR SYSTEM COULD NOT BE RESTORED WITHIN THE TS TIME RESTRICTIONS AFTER PERFORMING A LLRT. THE INBOARD SUCTION ISOL. VALVE CLOSED DUE TO UNANTICIPATED SYSTEMS INTERACTION (PROCEDURE ERROR.) AND COULD NOT BE OPENED BECAUSE OF HYDRAULIC LOCK.

**SSF** 06/14/89 LER# 39789024 50.72#: POWER: 0  
SYSTEM: REACTOR BUILDING  
DESC: A LEAKAGE PATH WAS DISCOVERED THROUGH THE CONTROL ROD DRIVE SYSTEM HCU'S WHICH WOULD BYPASS THE SECONDARY CONTAINMENT SYSTEMS AND VIOLATE THE DESIGN BASIS LIMITS FOR CONTROL ROOM HABITABILITY DURING A LOCA AND CONCURRENT SEISMIC EVENT.

**SSA** 06/18/89 LER# 39789025 50.72#: 15899 POWER: 0  
DESC: HPCS SYSTEM ALIGNED FOR INJECTION WHEN A TECHNICIAN VENTED THE HIGH SIDE OF REACTOR LEVEL TRANSMITTER INSTEAD OF THE LOW SIDE SENDING A FALSE LOW REACTOR LEVEL SIGNAL.

**SCRAM** 06/29/89 LER# 50.72#: 15987 POWER: 24  
DESC: WHILE TURBINE WAS COASTING DOWN AFTER AN OVERSPEED TEST, CONTROL SWITCH TAKEN TO INSERVICE POSITION, TURBINE TRIED TO MATCH SPEEDS RAISING PRESSURE TO 30% REACTOR POWER SCRAM SETPOINT.

**TABLE 8.106 (CONT.)**  
**WASH. NUCLEAR 2 (CONT.)**

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.21	.00	.66	.00	.00	.00	.49	1.30
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	2	0	1	0	0	0	1	1
SAFETY SYSTEM ACTUATIONS	1	0	0	0	0	0	1	2
SIGNIFICANT EVENTS	0	0	2	0	1	0	0	0
SAFETY SYSTEM FAILURES	0	0	1	3	0	0	1	3
FORCED OUTAGE RATE (%)	16	0	32	0	7	10	4	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	1.81	.00	1.97	.00	.53	.50	.49	.00
CRITICAL HOURS	1658	2117	1520	904	1895	1992	2028	770
COLLECTIVE RADIATION EXPOSURE	42	32	43	201	64	44	36	NA
CAUSE CODES:								
ADMINISTRATIVE	7	2	6	6	5	3	4	NA
LICENSED OPERATOR	0	0	1	4	1	0	0	NA
OTHER PERSONNEL	1	2	3	3	5	2	2	NA
MAINTENANCE	6	3	4	12	7	4	3	NA
A) MAINT PERSONNEL	1	0	2	5	4	1	3	NA
B) SURV AND TEST	3	3	2	4	4	3	1	NA
C) EQUIPMENT	2	0	0	1	1	2	0	NA
D) POTENTIAL MAINT	2	0	0	2	0	1	0	NA
DESIGN/INSTALLATION/FABRICATION	4	1	3	5	4	0	3	NA
EQUIPMENT FAILURE	0	0	0	0	1	0	0	NA



TABLE 8.109

WATERFORD 3

PI EVENTS FOR 88-3

NONE

PI EVENTS FOR 88-4

**SCRAM** 12/08/88 LER# 38288033 50.72#: 14177 POWER: 100  
 DESC: THE PDP COVER STRUCK SEVERAL DISTRIBUTION PANEL BREAKERS WHILE BEING REMOVED FOR MAINTENANCE. WHEN THE BREAKERS WERE CLOSED THE RPCS SENSED A LARGE LOAD REDUCTION, RESULTING IN RUNBACK, SG SHRINK, AND A LOW SG LEVEL SCRAM.

PI EVENTS FOR 89-1

**SSA** 02/04/89 LER# 38289003 50.72#: 14703 POWER: 70  
 DESC: LPSI START SIGNAL WHEN TESTING HPSI DUE TO NOT PLACING CONTROL SWITCH TO THE 'OFF' POSITION CAUSED LPSI PUMP TO START.

**SSF** 03/03/89 LER# 38289004 50.72#: POWER: 100  
 SYSTEM: REACTOR BUILDING ENVIRONMENTAL CONTROL SYSTEM  
 DESC: ESSENTIAL CHILLER "A" TRAIN DUE TO STUCK FLOAT SWITCH (FLOAT DEVELOPED A CRACK, FILLED WITH FREON AND SANK). REPLACED FLOATS ON OTHER TRAINS. POTENTIAL FOR SYSTEM INABILITY TO MAINTAIN TEMPERATURE.

PI EVENTS FOR 89-2

NONE

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.53	.51	.00	1.29	.00	.63	.00	.00
SCRAMS < 15% POWER	0	0	1	0	0	0	0	0
TOTAL SCRAMS	1	1	1	1	0	1	0	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	0	1	0
SIGNIFICANT EVENTS	0	0	0	1	0	0	0	0
SAFETY SYSTEM FAILURES	0	0	0	0	0	0	1	0
FORCED OUTAGE RATE (%)	14	11	5	5	0	2	3	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	1.05	.51	.00	1.29	.00	.00	.48	.00
CRITICAL HOURS	1898	1950	2084	777	2173	1590	2101	2183
COLLECTIVE RADIATION EXPOSURE	16	32	10	201	12	36	9	NA
CAUSE CODES:								
ADMINISTRATIVE	4	4	3	11	1	4	3	NA
LICENSED OPERATOR	0	0	0	1	1	0	0	NA
OTHER PERSONNEL	2	1	2	9	1	3	1	NA
MAINTENANCE	6	4	3	15	3	3	1	NA
A) MAINT PERSONNEL	0	1	2	4	0	1	0	NA
B) SURV AND TEST	5	2	0	11	3	2	1	NA
C) EQUIPMENT	3	0	2	2	0	0	0	NA
D) POTENTIAL MAINT	0	1	2	0	0	0	0	NA
DESIGN/INSTALLATION/FABRICATION	3	1	1	4	0	4	2	NA
EQUIPMENT FAILURE	1	0	0	0	0	0	0	NA

**TABLE 8.110**

**WOLF CREEK**

**PI EVENTS FOR 88-3**

**NONE**

**PI EVENTS FOR 88-4**

**SE** 11/08/88 LER# 50.72#: POWER: 0  
 DESC: PLANNED INSPECTION OF HAFNIUM CONTROL RODS REVEALS UNEXPECTED SWELLING OF THE CONTROL RODS CLADDING.  
 (MORNING REPORT: 11/08/88)

**SE** 11/30/88 LER# 50.72#: POWER: 0  
 DESC: BROKEN BOLTS IN FUEL INJECTOR FOR DIESEL GENERATOR "A". BOLTS FAILED MECHANICAL PROPERTY TESTS.  
 CORRECT CHEMICAL COMPOSITION. (MORNING REPORT: 12/01/88)

**SSF** 12/01/88 LER# 48288027 50.72#: POWER: 0  
 SYSTEM: POST-ACCIDENT MONITORING SYSTEM  
 DESC: NOTICE FROM THE VENDOR, IDENTIFIED A SIGNIFICANT POSSIBILITY OF LEAKAGE IN THE CABLE ASSEMBLIES OF THE  
 NEUTRON FLUX MONITORING SYSTEMS. NOT QUALIFIED FOR POST ACCIDENT CONDITIONS.

**PI EVENTS FOR 89-1**

**SCRAM** 01/23/89 LER# 48289002 50.72#: 14561 POWER: 100  
 DESC: FAULTY CIRCUIT CARD IN BEARING VIBRATION SENSOR CAUSED TURBINE TRIP - SCRAM ON #7 BEARING HIGH  
 VIBRATION.

**3SCRAM** 02/02/89 LER# 48289004 50.72#: 14623 POWER: 100  
 DESC: TECH BUMPED A TERMINAL STRIP WHICH HAD A LOOSE SCREW WHEN TESTING HVAC DAMPERS CAUSING MSIV CLOSURE  
 CAUSING LOW SG LEVEL SHRINK AND SCRAM.

**PI EVENTS FOR 89-2**

**SSF** 04/19/89 LER# 48289009 50.72#: POWER: 100  
 SYSTEM: FIRE PROTECTION SYSTEM (WATER)  
 DESC: SIGNIFICANT DEGRADATION OF THE FIRE PROTECTION SYSTEM CAUSED BY INCOMPLETE PENETRATION OF THE PIPE  
 SEAM WELDS.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	1.53	.00	.00	.00	.00	.00	.95	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	3	0	0	0	0	0	2	0
SAFETY SYSTEM ACTUATIONS	2	2	0	0	0	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	2	0	0
SAFETY SYSTEM FAILURES	2	1	0	0	0	1	0	1
FORCED OUTAGE RATE (%)	12	0	31	0	0	0	2	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	1.02	.00	1.90	.00	.00	.00	.95	.00
CRITICAL HOURS	1964	0	1581	2183	2208	146	2115	2183
COLLECTIVE RADIATION EXPOSURE	3	117	60	4	3	229	5	NA
CAUSE CODES:								
ADMINISTRATIVE	7	6	0	2	3	0	3	NA
LICENSED OPERATOR	3	2	0	1	0	1	3	NA
OTHER PERSONNEL	4	3	2	0	0	4	2	NA
MAINTENANCE	11	8	2	2	3	3	7	NA
A) MAINT PERSONNEL	3	2	2	0	1	2	1	NA
B) SURV AND TEST	7	5	0	2	2	1	5	NA
C) EQUIPMENT	3	1	0	0	1	1	1	NA
D) POTENTIAL MAINT	2	1	0	0	0	0	1	NA
DESIGN/INSTALLATION/FABRICATION	4	4	1	4	4	6	1	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

**TABLE 8.111**

**YANKEE-ROWE**

**PI EVENTS FOR 88-3**

**NONE**

**PI EVENTS FOR 88-4**

**SSF** 11/09/88 LER# 02988009 50.72#: POWER: 58  
 SYSTEM: PLANT PROTECTION SYSTEM  
 DESC: PROCEDURE ERROR RESULTED IN NEUTRON FLUX TRIP SETPOINTS (GAIN ADJUSTMENTS OF INTERMEDIATE RANGE AND POWER RANGE) IN ERROR, COULD HAVE RESULTED IN REACTOR TRIP IN EXCESS OF TECH. SPEC. 2.2.1 LIMITS.

**SSA** 11/16/88 LER# 02988010 50.72#: 1400B POWER: 0  
 DESC: TESTING MAIN GENERATOR STATIC EXCITER WHEN A BREAKER OPENED CAUSING LOSS OF 400 V BUSES. ONE DIESEL STARTED, OTHERS OOS FOR MAINTENANCE DUE TO INADEQUATE TROUBLESHOOTING PROCEDURE.

**SSF** 12/06/88 LER# 02988014 50.72#: POWER: 0  
 SYSTEM: PLANT PROTECTION SYSTEM  
 DESC: LOW TRIP SETPOINTS OF CHANNELS 7 AND 8 OF THE POWER RANGE NIS WERE FOUND TO HAVE EXCEEDED TECH. SPEC. LIMITS. AUTO TRIP FEATURE OF PPS MAY NOT HAVE BEEN AVAILABLE AT CERTAIN POWER LEVELS. FAULTY RELAY

**PI EVENTS FOR 89-1**

**NONE**

**PI EVENTS FOR 89-2**

**SCRAM** 04/23/89 LER# 02989007 50.72#: 15427 POWER: 100  
 DESC: A REACTOR TRIP OCCURRED ON LOW REACTOR COOLANT PRESSURE WHEN GROUP C CONTROL RODS DROPPED.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.94	.47	.00	.00	.00	.47
SCRAMS < 15% POWER	1	0	0	0	0	0	0	0
TOTAL SCRAMS	1	0	2	1	0	0	0	1
SAFETY SYSTEM ACTUATIONS	0	0	0	1	0	1	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	0	0	0
SAFETY SYSTEM FAILURES	0	0	2	0	0	2	0	0
FORCED OUTAGE RATE (%)	2	2	4	2	0	0	1	4
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.92	1.36	.94	.47	.00	.00	.53	.94
CRITICAL HOURS	2174	2209	2117	2148	2208	1014	1891	2122
COLLECTIVE RADIATION EXPOSURE	11	9	9	10	13	195	23	NA
CAUSE CODES:								
ADMINISTRATIVE	1	0	2	1	0	3	2	NA
LICENSED OPERATOR	0	0	0	0	0	0	0	NA
OTHER PERSONNEL	2	0	0	1	0	0	3	NA
MAINTENANCE	2	2	3	2	0	4	4	NA
A) MAINT PERSONNEL	1	0	0	0	0	0	3	NA
B) SURV AND TEST	1	0	1	1	0	2	3	NA
C) EQUIPMENT	0	2	0	0	0	2	0	NA
D) POTENTIAL MAINT	0	2	2	1	0	2	0	NA
DESIGN/INSTALLATION/FABRICATION	0	0	0	0	0	2	0	NA
EQUIPMENT FAILURE	0	0	1	0	0	0	0	NA

**TABLE 8.112**

**ZION 1**

**PI EVENTS FOR 88-3**

**SCRAM** 07/13/88 LER# 29588013 50.72#: 12818 POWER: 98  
DESC: FEED FLOW CONTROLLER FAILED HIGH DUE TO MAIN FEEDWATER SQUARE ROOT EXTRACTOR FAILURE CAUSING A REACTOR TRIP ON FEEDFLOW/STEAMFLOW MISMATCH WITH LOW SG LEVEL.

**SSA** 07/15/88 LER# 29588015 50.72#: 12852 POWER: 0  
DESC: LOW VOLTAGE CONDITION ON GRID CAUSED SWING DIESEL TO START DUE TO LARGE LOAD DEMAND ON THE SYSTEM.

**SCRAM** 07/23/88 LER# 29588017 50.72#: 12936 POWER: 10  
DESC: WHILE REDUCING POWER TO FIX LEAK, OPERATOR MANUALLY TRIPPED TURBINE. FEEDWATER CONTROL PROBLEMS CAUSED REACTOR POWER TO CLIMB ABOVE 10%. WHEN THE TURBINE WAS TRIPPED, THE REACTOR TRIPPED.

**PI EVENTS FOR 88-4**

**SE** 10/25/88 LER# 29588019 50.72#: 13812 POWER: 0  
DESC: ANTI PUMP FEATURE OF MOTOR CIRCUIT BREAKERS COULD PREVENT ACTIVATION OF CCW SWS AND AFW PUMPS ON SI WITH LOSS OF NON-VITAL POWER.

**SSF** 10/25/88 LER# 29588019 50.72#: 13812 POWER: 50  
SYSTEM: AUXILIARY/EMERGENCY FEEDWATER SYSTEM  
DESC: DURING A REVIEW OF TEST RESULTS, A DETERMINATION WAS MADE THAT THE AFW AND THE CCW PUMPS MIGHT NOT START AS REQUIRED DURING A BLACKOUT. DESIGN ERROR - BREAKERS WOULD LOCKOUT ON ANTI-PUMP FEATURE

**PI EVENTS FOR 89-1**

**SCRAM** 01/27/89 LER# 29589002 50.72#: 14579 POWER: 99  
DESC: WHILE TROUBLESHOOTING AN INDICATION PROBLEM WITH THE CONTINUITY LIGHT WITH THE TURBINE - A TURBINE TRIP/SCRAM OCCURRED DUE TO TECH PLACING TEST LEADS ACROSS WRONG TERMINAL POINTS.

**SSF** 03/11/89 LER# 29589007 50.72#: POWER: 60  
SYSTEM: CONTAINMENT SPRAY SYSTEM  
DESC: CONTAINMENT SPRAY SYSTEM COULD NOT PERFORM ITS DESIGN FUNCTION OF DELIVERING CS DURING THE COLD LEG RECIRCULATION PHASE FOLLOWING A LOCA DUE TO TRAIN A RHR SUPPLY VALVE FAILURE (BORIC ACID BUILDUP) AND TRAIN B RHR INOPERABLE DUE TO SUMP VALVE FAILURE

**PI EVENTS FOR 89-2**

**SSF** 06/09/89 LER# 29589008 50.72#: POWER: 99  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: THE CONTAINMENT SPRAY PUMP CUBICLE ROOM COOLER SERVICE WATER MAY NOT BE ABLE TO SUPPLY REQUIRED AMOUNT OF COOLING WATER DURING A SAFETY INJECTION ACTUATION AT ONE UNIT DUE TO CROSS-TIE VALVE CONFIGURATION.

TABLE 8.112 (CONT.)

## ZION 1 (CONT.)

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.77	.00	.48	.00	.65	.00
SCRAMS < 15% POWER	0	0	0	1	1	0	0	0
TOTAL SCRAMS	0	0	1	1	2	0	1	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	1	0	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	1	0	0
SAFETY SYSTEM FAILURES	0	0	1	1	0	1	1	1
FORCED OUTAGE RATE (%)	0	0	1	0	7	11	31	0
EQUIP. FORCED OUTAGES/1000 CRITICAL HOURS	.00	.00	.77	.00	.48	.00	1.31	.00
CRITICAL HOURS	2208	2209	1306	1362	2099	1981	1527	2183
COLLECTIVE RADIATION EXPOSURE	64	10	198	179	12	241	42	NA
CAUSE CODES:								
ADMINISTRATIVE	2	1	3	3	4	2	2	NA
LICENSED OPERATOR	0	0	1	0	1	0	1	NA
OTHER PERSONNEL	1	1	2	0	2	1	1	NA
MAINTENANCE	2	2	6	4	5	4	4	NA
A) MAINT PERSONNEL	1	1	2	0	1	1	1	NA
B) SURV AND TEST	1	0	3	2	3	1	1	NA
C) EQUIPMENT	1	0	2	2	1	1	0	NA
D) POTENTIAL MAINT	0	1	2	3	1	2	3	NA
DESIGN/INSTALLATION/FABRICATION	0	0	2	0	2	2	0	NA
EQUIPMENT FAILURE	0	0	0	0	0	0	0	NA

TABLE 8.113

ZION 2

PI EVENTS FOR 88-3

NONE

PI EVENTS FOR 88-4

**SCRAM** 10/08/88 LER# 30488007 50.72#: 13643 POWER: 56  
DESC: DURING WEEKLY ROD MOVEMENT TEST, AN URGENT FAILURE ALARM OCCURRED. DURING TROUBLESHOOTING, A BLOWN FUSE WAS INDICATED. THE FUSE WAS REMOVED FOR REPLACEMENT. THIS CAUSED A ROD TO DROP WHICH CAUSED A SCRAM.

**SCRAM** 10/12/88 LER# 30488009 50.72#: 13689 POWER: 94  
DESC: AN INADEQUATE PROCEDURE THAT DID NOT SPECIFY ISOLATING THE VACUUM ALARM SWITCH RESULTED IN A SENSED LOW VACUUM TURBINE TRIP AND A REACTOR TRIP.

**SE** 10/25/88 LER# 30488019 50.72#: 13812 POWER: 0  
DESC: ANTI PUMP FEATURE OF MOTOR CIRCUIT BREAKERS COULD PREVENT ACTIVATION OF CCW SWS AND AFW PUMPS ON S1 WITH LOSS OF NON-VITAL POWER.

**SSF** 10/25/88 LER# 29588019 50.72#: 13812 POWER: 0  
SYSTEM: AUXILIARY/EMERGENCY FEEDWATER SYSTEM  
DESC: DURING A REVIEW OF TEST RESULTS, A DETERMINATION WAS MADE THAT THE AFW AND THE CCW PUMPS MIGHT NOT START AS REQUIRED DURING A BLACKOUT. DESIGN ERROR - BREAKERS WOULD LOCKOUT ON ANTI-PUMP FEATURE

**SSA** 12/11/88 LER# 30488012 50.72#: 14210 POWER: 0  
DESC: POOR COMMUNICATIONS BETWEEN TEST ENGINEER AND SHIFT ENGINEER CAUSED BREAKER TO BE SHUT BEFORE TESTING COMPLETE CAUSING S1.

PI EVENTS FOR 89-1

NONE

PI EVENTS FOR 89-2

**SSA** 04/09/89 LER# 29589008 50.72#: POWER: 909  
SYSTEM: ESSENTIAL SERVICE WATER SYSTEM  
DESC: THE CONTAINMENT SPRAY PUMP CUBICLE ROOM COOLER SERVICE WATER MAY NOT BE ABLE TO SUPPLY REQUIRED AMOUNT OF COOLING WATER DURING A SAFETY INJECTION ACTUATION AT ONE UNIT DUE TO CROSS-TIE VALVE CONFIGURATION.

TYPE	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
SCRAMS > 15% POWER/1000 CRITICAL HOURS	.00	.00	.00	.00	.00	4.85	.00	.00
SCRAMS < 15% POWER	0	0	0	0	0	0	0	0
TOTAL SCRAMS	0	0	0	0	0	2	0	0
SAFETY SYSTEM ACTUATIONS	0	0	0	0	0	1	0	0
SIGNIFICANT EVENTS	0	0	0	0	0	1	0	0
SAFETY SYSTEM FAILURES	0	0	0	0	0	1	0	1
FORCED OUTAGE RATE (%)	0	5	0	0	0	11	21	1
EQUIP. FORCED %AGES/1000 CRITICAL HOURS	.00	.47	.00	.00	.00	2.33	1.15	.46
CRITICAL HOURS	1458	2118	2184	2183	2208	430	1734	2183
COLLECTIVE RADIATION EXPOSURE	64	10	198	179	12	241	42	NA
CAUSE CODES:								
ADMINISTRATIVE	3	1	2	2	2	9	4	NA
LICENSED OPERATOR	3	0	2	1	0	3	2	NA
OTHER PERSONNEL	2	0	2	0	1	4	3	NA
MAINTENANCE	7	2	4	1	4	12	4	NA
A) MAINT PERSONNEL	2	0	3	0	1	3	4	NA
B) SURV AND TEST	4	0	1	1	2	7	1	NA
C) EQUIPMENT	3	1	1	0	1	5	0	NA
D) POTENTIAL MAINT	1	1	1	1	1	2	1	NA
DESIGN/INSTALLATION/FABRICATION	0	0	1	0	2	3	0	NA
EQUIPMENT FAILURE	0	0	0	0	0	1	0	NA

9. DATA TABLES  
OVERALL INDUSTRY SUMMARY  
PERFORMANCE INDICATORS  
CRITICAL HOURS

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TABLE 9.1

## OVERALL INDUSTRY SUMMARY

PLANT	PERFORMANCE INDICATORS										EQUIPMENT OUTAGES	
	AUTOMATIC		SAFETY SYSTEM ACTUATIONS		SIGNIFICANT EXERCISE		SAFETY SYSTEM FAILURES		FORCED OUTAGE RATE (%)		PER 1000 CRIT HRS	
	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR
	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END
	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2
ARKANSAS 1	0.25	1.00	0.00	0.50	0.50	0.50	1.25	0.50	10.00	49.00	0.71	1.25
ARKANSAS 2	0.25	0.50	1.00	0.00	0.25	0.50	1.00	0.50	6.25	18.50	0.52	0.90
BEAVER VALLEY 1	0.75	1.50	0.25	0.50	0.00	0.00	0.00	0.00	3.50	3.00	0.01	0.24
BEAVER VALLEY 2	1.00	0.50	0.50	1.50	0.00	0.00	0.70	0.00	2.75	24.50	0.63	1.29
BIG ROCK POINT	0.50	0.00	0.50	0.00	0.50	0.00	0.00	0.50	9.75	0.00	1.71	0.00
BRAIDWOOD 1	0.50	0.50	0.50	0.50	0.25	0.50	0.00	0.00	9.00	4.00	0.48	0.86
BRAIDWOOD 2	2.50	0.50	0.25	0.00	0.25	0.50	0.25	0.50	18.00	1.00	1.98	0.23
BROWNS FERRY 1	0.00	0.00	1.25	0.50	0.00	1.00	1.25	0.50	100.00	100.00	0.00	0.00
BROWNS FERRY 2	0.00	0.00	0.50	0.50	0.00	1.00	1.25	1.50	100.00	100.00	0.00	0.00
BROWNS FERRY 3	0.00	0.00	0.25	0.00	0.25	1.00	1.50	0.50	100.00	100.00	0.00	0.00
BRUNSWICK 1	0.50	0.00	0.25	0.00	0.75	0.00	4.00	1.50	3.50	13.00	0.38	0.33
BRUNSWICK 2	0.25	0.00	0.25	2.00	1.75	3.50	2.75	1.50	6.00	6.00	0.63	0.26
BYRON 1	0.75	0.00	0.00	0.00	0.25	0.00	0.00	0.00	2.00	0.50	0.50	0.24
BYRON 2	1.25	0.00	0.00	0.50	0.00	0.00	0.00	0.00	2.00	4.00	0.01	0.25
CALLAWAY	1.25	0.50	0.50	1.00	0.00	0.00	0.50	0.00	3.00	1.50	0.40	0.54
CALVERT CLIFFS 1	0.50	0.00	1.00	1.00	0.25	0.00	0.00	1.00	1.75	2.00	0.38	0.69
CALVERT CLIFFS 2	0.50	0.00	0.00	0.00	0.25	1.00	0.00	0.50	1.75	5.50	0.12	0.29
CATAMBA 1	0.00	0.50	0.25	1.00	0.50	0.00	1.00	0.50	7.75	7.50	0.56	2.04
CATAMBA 2	1.00	1.00	0.50	1.00	0.50	0.00	0.75	0.50	19.50	13.50	2.83	1.64

TABLE 9.1 (CONT'D)

OVERALL INDUSTRY SUMMARY

PLANT	PERFORMANCE RATINGS											
	AUTOMATIC SCRAMS		SAFETY SYSTEM ACTUATIONS		SIGNIFICANT EVENTS		SAFETY SYSTEM FAILURES		FORCED OUTAGE RATE (%)		EQUIPMENT OUTAGES PER 1000 CRIT HRS	
	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR
	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END
	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2
CLINTON 1	0.50	0.50	0.25	0.00	0.25	0.50	1.75	1.50	6.75	34.50	1.22	2.34
COOK 1	0.75	1.00	0.00	0.00	0.25	0.00	0.50	0.00	1.75	0.50	0.26	0.00
COOK 2	0.00	0.00	0.00	0.60	0.25	0.00	0.50	0.00	0.00	0.00	0.00	0.00
COOPER STATION	0.50	0.50	1.25	1.00	0.00	0.00	9.25	3.00	5.50	6.00	0.31	0.26
CRYSTAL RIVER 3	0.50	0.50	0.50	2.00	0.50	1.00	0.00	1.00	1.75	6.00	0.13	0.00
DAVIS-BESSE	0.25	1.00	0.00	0.00	0.00	0.00	0.75	0.50	3.75	3.50	0.54	0.49
DIABLO CANYON 1	1.25	0.00	0.50	0.00	0.00	0.50	0.25	0.50	2.00	0.00	0.13	0.00
DIABLO CANYON 2	0.50	0.50	0.75	0.00	0.25	0.50	0.25	1.00	9.00	2.00	0.52	0.26
DRESDEN 2	0.00	0.50	0.00	0.50	0.50	0.50	1.50	1.50	0.00	4.50	0.13	0.00
DRESDEN 3	0.25	1.50	0.00	1.00	0.00	0.00	0.00	1.50	0.00	5.50	0.00	1.71
DUANE ARNOLD	0.25	1.50	0.50	1.00	0.25	0.00	1.00	2.00	25.75	14.00	1.56	1.33
FARLEY 1	0.25	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.75	0.00	0.00	0.00
FARLEY 2	0.00	1.00	0.00	0.50	0.00	0.00	0.50	0.00	0.00	6.50	0.00	0.00
FERMI 2	1.00	0.50	0.75	0.50	0.50	0.50	2.00	1.50	17.75	14.00	0.76	0.27
FITZPATRICK	0.00	0.00	0.25	0.00	0.50	0.00	1.75	3.50	10.50	0.00	0.00	0.00
FORT CALHOUN	0.00	0.00	0.25	0.00	0.25	0.00	1.25	0.00	0.00	4.50	0.00	0.00

TABLE 9.1 (CONT'D)

OVERALL INDUSTRY SUMMARY

PLANT	PERFORMANCE INDICATORS											
	AUTOMATIC SCRAMS		SAFETY SYSTEM ACTUATIONS		SIGNIFICANT EVENTS		SAFETY SYSTEM FAILURES		FORCED OUTAGE RATE (%)		EQUIPMENT OUTAGES	
	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR
	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END
	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2
FORT ST. VRAIN	0.25	0.00	0.00	0.00	0.25	0.00	0.25	0.50	11.50	64.50	0.56	0.76
GINNA	0.50	0.50	1.00	0.00	0.00	0.00	0.00	0.00	5.50	6.50	0.45	0.28
GRAND GULF	1.50	0.50	0.50	0.50	0.25	0.00	0.50	1.00	4.75	0.00	0.61	0.00
HADDAM NECK	0.75	0.00	0.00	0.50	0.25	0.00	1.50	3.00	0.00	0.00	0.00	0.00
HATCH 1	1.25	0.06	0.75	0.00	0.00	0.00	1.75	1.00	16.50	0.00	0.71	0.00
HATCH 2	1.25	0.00	0.50	0.00	0.00	0.00	1.75	0.50	13.50	0.00	0.12	0.00
HOPE CREEK	1.00	0.00	1.50	1.00	0.00	0.00	1.75	1.50	4.75	0.00	0.76	0.29
INDIAN POINT 2	1.00	0.50	0.25	0.00	0.75	1.00	0.50	0.50	3.75	0.50	0.51	0.28
INDIAN POINT 3	0.75	0.00	0.25	0.50	5.00	0.00	0.25	0.00	12.75	4.00	0.78	2.33
KEMUNEE	0.75	0.00	0.50	0.00	0.00	0.00	0.25	0.50	1.75	0.00	0.43	0.00
LASALLE 1	0.00	0.50	0.00	6.00	0.00	0.50	0.50	1.00	1.75	2.00	0.00	0.24
LASALLE 2	0.25	0.00	0.00	1.50	0.25	0.50	1.00	1.00	4.25	0.00	0.24	0.00
LIMERICK 1	0.25	0.00	0.00	0.00	3.50	0.50	1.00	6.00	3.50	0.00	0.00	0.00
LIMERICK 2			0.00	0.00	0.00	0.00	0.00	0.00				
MAINE YANKEE	0.75	1.00	0.75	0.00	0.25	0.00	0.50	6.00	11.00	6.00	1.34	0.51

TABLE 9.1 (CONT'D)

OVERALL INDUSTRY SUMMARY

	PERFORMANCE INDICATORS													
	AUTOMATIC		SAFETY SYSTEM		SIGNIFICANT		SAFETY SYSTEM		FORCED OUTAGE		EQUIPMENT			
	SCRAMS	ACTUATIONS	ACTS	ACTS	ACTS	ACTS	ACTS	ACTS	ACTS	ACTS	ACTS	ACTS		
	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR
	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END
PLANT	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2
MCGUIRE 1	0.75	0.00	0.50	0.50	0.50	0.50	1.75	1.00	1.00	35.00	0.47	0.72		
MCGUIRE 2	0.25	1.50	0.25	0.00	0.25	0.00	0.75	0.50	1.00	1.50	0.97	0.70		
MILLSTONE 1	6.25	1.00	0.00	0.50	0.00	1.00	1.00	3.00	2.00	5.50	0.23	0.56		
MILLSTONE 2	0.25	0.00	1.00	0.50	0.00	0.00	0.25	0.00	3.50	0.00	0.17	0.00		
MILLSTONE 3	1.00	0.50	0.25	0.50	0.50	0.00	1.00	0.00	10.50	14.00	0.41	1.96		
MONTICELLO	0.25	0.50	0.00	0.00	0.00	0.00	0.00	2.00	0.25	2.50	0.12	0.00		
NINE MILE PT. 1	0.00	0.00	0.25	0.50	0.25	0.00	0.75	0.00	100.00	100.00	0.00	0.00		
NINE MILE PT. 2	1.75	1.00	1.50	2.00	6.25	1.00	2.00	9.00	14.00	6.00	1.12	0.50		
NORTH ANNA 1	0.75	0.50	0.25	1.00	0.00	1.00	0.50	1.00	10.75	5.00	0.29	0.38		
NORTH ANNA 2	0.00	0.00	0.25	0.50	0.00	0.50	0.50	0.50	0.00	0.00	0.00	0.00		
OCONEE 1	0.25	0.50	0.00	0.00	0.00	1.00	0.50	3.00	0.50	5.50	0.12	0.92		
OCONEE 2	0.25	1.50	0.00	0.00	0.25	0.50	0.75	2.50	0.75	4.50	0.13	1.78		
OCONEE 3	0.50	0.50	0.00	0.00	0.25	1.00	1.00	2.50	6.25	2.00	0.89	0.48		
OYSTER CREEK	0.00	1.00	0.25	0.50	0.50	0.00	1.50	1.50	34.25	70.00	0.18	8.35		
PALISADES	0.00	0.00	0.00	0.00	0.25	0.00	1.00	1.00	23.75	17.00	0.74	0.35		
PALO VERDE 1	1.25	0.50	0.50	0.00	0.25	0.00	1.25	0.00	34.50	65.00	1.19	0.33		
PALO VERDE 2	0.25	0.50	0.75	1.00	0.00	0.00	1.00	0.00	2.25	8.50	0.12	0.34		
PALO VERDE 3	0.00	0.50	0.25	0.50	0.00	0.50	6.75	0.50	5.00	15.50	0.00	0.91		
PEACH BOTTOM 2	0.00	0.50	0.75	1.00	0.50	0.00	0.75	3.00	0.00	3.00	0.00	0.74		

TABLE 9.1 (CONT'D)

## OVERALL INDUSTRY SUMMARY

PLANT	PERFORMANCE INDICATORS											
	AUTOMATIC SCRAMS		SAFETY SYSTEM ACTUATIONS		SIGNIFICANT EVENTS		SAFETY SYSTEM FAILURES		FORCED OUTAGE RATE (%)		EQUIPMENT OUTAGES PER 1000 CRIT HRS	
	4 QTR	AVG END	4 QTR	AVG END	4 QTR	AVG END	4 QTR	AVG END	4 QTR	AVG END	4 QTR	AVG END
	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2
PEACH BOTTOM 3	0.00	0.00	0.50	0.00	0.50	0.00	0.50	0.50	0.00	0.00	0.00	0.00
PERRY	2.00	0.00	0.50	0.00	0.75	0.50	2.75	2.50	14.00	1.00	1.07	0.40
PILGRIM	0.00	1.00	0.25	1.50	0.00	1.00	0.50	3.00	0.00	35.50	0.00	0.00
POINT BEACH 1	0.00	0.00	0.00	0.00	0.25	0.00	1.00	2.00	0.00	0.00	0.00	0.00
POINT BEACH 2	0.25	0.50	0.50	0.50	0.00	0.00	0.75	0.50	0.25	2.50	0.12	0.24
PRAIRIE ISLAND 1	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.75	0.00	0.50	0.00
PRAIRIE ISLAND 2	0.00	0.50	0.00	0.00	0.00	0.00	0.50	0.00	1.00	0.50	0.12	0.33
QUAD CITIES 1	0.25	0.50	0.00	0.00	0.00	0.50	1.50	1.50	4.50	6.50	0.75	1.02
QUAD CITIES 2	0.50	0.50	0.50	0.00	0.00	0.00	1.25	1.00	8.00	3.50	0.59	0.95
RANCHO SECO	0.75	0.50	0.75	0.50	0.25	1.00	0.25	2.00	33.00	36.50	0.65	1.66
RIVER BEND	1.25	1.00	0.75	1.00	0.25	0.50	0.25	1.00	4.25	43.00	0.50	8.11
ROBINSON 2	0.75	1.50	0.25	0.50	0.00	0.50	1.50	0.50	23.00	10.50	1.32	0.85
SALEM 1	0.50	1.50	0.00	1.00	0.00	0.50	0.75	2.00	3.25	41.50	1.14	5.02
SALEM 2	1.75	1.50	0.25	0.50	0.25	0.00	1.25	0.00	21.75	18.50	2.89	1.87
SAN ONOFRE 1	0.00	0.00	0.00	0.00	0.50	1.00	0.75	2.00	0.00	43.50	0.00	2.41
SAN ONOFRE 2	0.00	0.00	0.00	0.00	0.25	0.00	1.25	0.00	0.75	31.00	0.12	0.66
SAN ONOFRE 3	0.00	1.00	0.25	0.50	0.25	0.00	1.25	0.50	5.00	7.50	0.13	0.76

TABLE 5.1 (CONT'D)

OVERALL INDUSTRY SUMMARY

PLANT	PERFORMANCE INDICATORS											
	AUTOMATIC SCRAMS	SAFETY SYSTEM ACTUATIONS	SIGNIFICANT EVENTS	SAFETY SYSTEM FAILURES	FORCED OUTAGE RATE (%)	EQUIPMENT OUTAGES PER 1000 CRIT HRS	WHILE CRITICAL	4 QTR 2 QTR	4 QTR 2 QTR	4 QTR 2 QTR	4 QTR 2 QTR	4 QTR 2 QTR
	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2
SEABROOK	0.00	0.00	0.00	0.00	0.25	6.50						
SEQUOIA 1	0.50	0.50	0.00	0.00	0.25	0.00	1.06	1.00	96.75	1.50	1.31	0.00
SEQUOIA 2	1.25	1.50	0.50	1.00	0.00	0.00	1.75	1.00	42.25	8.00	0.96	0.30
SHEARON HARRIS	0.25	2.50	0.50	0.00	0.25	0.00	2.00	0.00	3.50	3.00	0.40	0.72
SHOREHAM	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00				
SOUTH TEXAS 1	1.00	1.00	1.75	0.50	0.25	0.00	2.75	0.00	14.00	6.50	2.41	0.89
SOUTH TEXAS 2	1.50	1.50	0.00	3.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
ST. LUCIE 1	0.75	0.00	0.25	0.00	0.00	0.00	0.00	0.00	2.50	0.00	0.97	0.00
ST. LUCIE 2	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.32
SUMNER	1.00	0.50	0.50	0.00	0.00	0.00	0.25	1.00	4.00	23.50	0.37	0.28
SURRY 1	0.50	0.00	0.25	2.00	0.25	1.50	1.50	1.00	32.50	100.00	0.29	0.00
SURRY 2	0.50	0.00	0.50	1.50	1.00	1.50	1.50	1.00	12.50	0.00	0.32	0.00
SUSQUEHANNA 1	0.50	1.00	0.00	0.00	0.00	0.00	0.75	0.00	4.75	11.00	0.13	0.58
SUSQUEHANNA 2	0.00	0.00	0.00	0.00	0.25	0.00	0.75	0.50	1.00	3.50	1.13	0.25
THREE MILE ISL 1	0.25	0.00	0.00	0.00	0.25	0.00	0.00	0.00	10.00	0.00	0.79	0.00
TROJAN	1.00	0.00	0.25	0.00	0.25	0.50	1.25	2.00	9.00	0.00	0.54	0.00
TURKEY POINT 3	0.00	0.50	0.00	1.00	0.00	0.50	1.50	0.50	39.25	22.50	23.00	0.41

TABLE 9.1 (CONT'D)

OVERALL INDUSTRY SUMMARY

PLANT	PERFORMANCE INDICATORS											
	AUTOMATIC SCRAMS	SAFETY SYSTEM ACTUATIONS		SIGNIFICANT EVENTS		SAFETY SYSTEM FAILURES		FORCED OUTAGE RATE (%)		EQUIPMENT OUTAGES PER 1000 CRIT HRS		
	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR	4 QTR	2 QTR
	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END	AVG END
	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2	88-4	89-2
TURKEY POINT 4	0.25	0.00	0.00	0.50	0.00	0.00	1.50	0.50	14.25	3.50	0.62	0.09
VERMONT YANKEE	0.75	0.00	0.00	1.00	0.25	0.00	5.25	2.50	3.00	0.00	0.50	0.00
VOGTLE 1	1.50	0.50	0.25	0.00	0.25	0.00	0.25	1.50	11.50	7.50	1.29	0.75
VOGTLE 2	1.50	1.50	0.50	0.50	0.50	0.50	1.00	1.00	4.00	4.00	1.12	1.12
WASH. NUCLEAR 2	0.25	1.00	0.00	1.50	0.75	0.00	1.00	2.00	12.25	2.00	0.75	0.25
WATERFORD 3	0.75	0.00	0.00	0.50	0.25	0.00	0.00	0.50	3.00	1.50	0.32	0.24
WOLF CREEK	0.00	1.00	0.00	0.00	0.50	0.00	0.25	0.50	7.75	1.00	0.48	0.48
YANKEE-ROME	0.75	0.50	0.50	0.00	0.00	0.00	1.00	0.00	1.50	2.50	0.35	0.74
ZION 1	1.00	0.50	0.25	0.00	0.25	0.00	0.75	1.00	4.75	15.50	0.31	0.66
ZION 2	0.50	0.00	0.25	0.00	0.25	0.00	0.25	0.50	2.75	11.00	0.58	0.81

**TABLE 9.2 AUTOMATIC SCRAMS WHILE CRITICAL**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
ARKANSAS 1	2	0	1	0	0	0	1	1
ARKANSAS 2	1	1	0	0	0	1	0	1
BEAVER VALLEY 1	0	0	0	3	0	0	2	1
BEAVER VALLEY 2	7	7	1	1	2	0	1	0
BIG ROCK POINT	0	0	0	0	0	2	0	0
BRAIDWOOD 1	3	1	0	0	1	1	1	0
BRAIDWOOD 2	NA	NA	0	4	3	3	0	1
BROWNS FERRY 1	0	0	0	0	0	0	0	0
BROWNS FERRY 2	0	0	0	0	0	0	0	0
BROWNS FERRY 3	0	0	0	0	0	0	0	0
BRUNSWICK 1	1	0	0	0	0	2	0	0
BRUNSWICK 2	0	0	0	0	0	1	0	0
CYON 1	4	0	3	1	2	0	0	0
CYON 2	1	2	1	1	2	1	0	0
CALLAWAY	0	1	2	2	1	0	0	1
CALVERT CLIFFS 1	3	1	0	0	2	0	0	0
CALVERT CLIFFS 2	2	1	1	1	0	0	0	0
CATAWBA 1	1	0	0	1	0	0	1	0
CATAWBA 2	2	0	1	1	0	0	2	0
CLINTON 1	5	1	0	1	0	1	0	1
COOK 1	0	1	1	0	0	2	2	0
COOK 2	2	1	0	0	0	0	0	0
COOPER STATION	0	0	1	0	1	0	1	0
CRYSTAL RIVER 3	2	0	1	0	0	1	0	1
DAVIS-BESSE	2	1	0	0	0	1	1	1
DIABLO CANYON 1	0	1	1	0	4	0	0	0
DIABLO CANYON 2	1	0	1	0	1	0	0	1
DRESDEN 2	2	1	0	0	0	0	1	0
DRESDEN 3	2	0	0	0	0	1	2	1
DUANE ARNOLD	0	0	0	0	1	0	2	1
FARLEY 1	0	0	0	0	0	1	0	0
FARLEY 2	0	1	0	0	0	0	0	2
FERMI 2	2	1	1	2	1	0	1	0
FITZPATRICK	3	2	0	0	0	0	0	0
FORT CALHOUN	0	0	0	0	0	0	0	0
FORT ST. VRAIN	0	1	0	1	0	0	0	0
GINNA	0	0	1	1	0	0	0	1
GRAND GULF	1	0	3	0	2	1	0	1
HADDAM NECK	0	0	2	1	0	0	0	0
HATCH 1	2	0	1	2	1	1	0	0
HATCH 2	2	0	1	3	1	0	0	0
HOPE CREEK	3	1	0	1	1	2	0	0
INDIAN POINT 2	0	0	1	1	0	2	1	0
INDIAN POINT 3	0	1	1	1	0	1	0	0
KEWAUNEE	1	0	1	2	0	0	0	0
LASALLE 1	1	1	0	0	0	0	1	0
LASALLE 2	0	0	1	0	0	0	0	0
LIMERICK 1	2	0	0	1	0	0	0	0
LIMERICK 2	NA	NA	NA	NA	NA	NA	NA	NA
MAINE YANKEE	1	0	1	0	1	1	1	1



**TABLE 9.2 AUTOMATIC SCRAMS WHILE CRITICAL (CONTINUED)**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
MCGUIRE 1	1	1	2	1	0	0	0	0
MCGUIRE 2	2	2	1	0	0	0	2	1
MILLSTONE 1	3	0	1	0	0	0	0	2
MILLSTONE 2	2	1	0	0	0	1	0	0
MILLSTONE 3	1	0	1	1	0	2	0	1
MONTICELLO	1	0	0	0	0	1	0	1
NINE MILE PT. 1	0	2	0	0	0	0	0	0
NINE MILE PT. 2	1	3	3	3	1	0	0	2
NORTH ANNA 1	0	1	2	0	1	0	1	0
NORTH ANNA 2	0	0	0	0	0	0	0	0
OCONEE 1	0	0	0	0	1	0	1	0
OCONEE 2	0	0	0	0	1	0	2	1
OCONEE 3	0	0	0	0	0	2	1	0
OYSTER CREEK	1	0	0	0	0	0	0	2
PALISADES	1	0	0	0	0	0	0	0
PALO VERDE 1	1	0	0	2	3	0	1	0
PALO VERDE 2	0	1	0	0	0	1	1	0
PALO VERDE 3	NA	1	0	0	0	0	1	0
PEACH BOTTOM 2	0	0	0	0	0	0	0	1
PEACH BOTTOM 3	0	0	0	0	0	0	0	0
PERRY	1	1	1	7	0	0	0	0
PILGRIM	0	0	0	0	0	0	1	1
POINT BEACH 1	0	1	0	0	0	0	0	0
POINT BEACH 2	1	0	0	1	0	0	1	0
PRAIRIE ISLAND 1	1	0	0	0	0	0	0	0
PRAIRIE ISLAND 2	0	0	0	0	0	0	0	1
QUAD CITIES 1	0	0	0	0	0	1	0	1
QUAD CITIES 2	2	2	2	0	0	0	0	1
RANCHO SECO	0	0	0	1	0	2	1	0
RIVER BEND	0	1	3	0	2	0	2	0
ROBINSON 2	4	0	1	2	0	0	3	0
SALEM 1	0	0	1	0	1	0	2	1
SALEM 2	1	0	0	4	2	1	2	1
SAN ONOFRE 1	0	0	0	0	0	0	0	0
SAN ONOFRE 2	0	0	0	0	0	0	0	0
SAN ONOFRE 3	0	1	0	0	0	0	1	1
SEABROOK	NA	NA	NA	NA	NA	NA	NA	0
SEQUOYAH 1	0	0	0	0	0	2	1	0
SEQUOYAH 2	0	0	0	5	0	0	0	3
SHEARON HARRIS	2	1	1	0	0	0	5	0
SHOREHAM	0	0	0	0	0	0	0	0
SOUTH TEXAS 1	NA	NA	1	0	3	0	2	0
SOUTH TEXAS 2	NA	NA	NA	NA	NA	NA	0	3
ST. LUCIE 1	0	2	1	1	1	0	0	0
ST. LUCIE 2	0	1	0	0	0	0	0	1
SUMMER	2	1	1	2	1	0	0	1
SURRY 1	1	0	1	0	1	0	0	0
SURRY 2	0	0	0	1	1	0	0	0
SUSQUEHANNA 1	0	0	1	1	0	0	2	0
SUSQUEHANNA 2	0	0	0	0	0	0	0	0

**TABLE 9.2 AUTOMATIC SCRAMS WHILE CRITICAL (CONTINUED)**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
THREE MILE ISL. 1	1	0	0	0	0	1	0	0
TROJAN	1	0	1	0	2	1	0	0
TURKEY POINT 3	1	0	0	0	0	0	1	0
TURKEY POINT 4	0	0	0	0	1	0	0	0
VERMONT YANKEE	1	2	0	2	1	0	0	0
VOGTLE 1	3	2	2	1	3	0	0	1
VOGTLE 2	NA	NA	NA	NA	NA	NA	0	3
WASH. NUCLEAR 2	2	0	1	0	0	0	1	1
WATERFORD 3	1	1	1	1	0	1	0	0
WOLF CREEK	3	0	0	0	0	0	2	0
YANKEE-ROWE	1	0	2	1	0	0	0	1
ZION 1	0	0	1	1	2	0	1	0
ZION 2	0	0	0	0	0	2	0	0

NA - The plant is not yet critical.

**TABLE 9.3 AUTOMATIC SCRAMS >15% POWER/1000 CRITICAL HOURS**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
ARKANSAS 1	0.46	0.00	0.46	0.00	0.00	0.00	1.92	0.57
ARKANSAS 2	0.51	0.46	0.00	0.00	0.00	0.46	0.00	0.64
BEAVER VALLEY 1	0.00	0.00	0.00	0.96	0.00	0.00	0.94	0.47
BEAVER VALLEY 2	8.28	3.50	0.56	0.46	0.94	0.00	0.59	0.00
BIG ROCK POINT	0.00	0.00	0.00	0.00	0.00	0.95	0.00	0.00
BRAIDWOOD 1	0.94	0.50	0.00	0.00	0.50	0.47	0.61	0.00
BRAIDWOOD 2	NA	NA	0.00	3.62	1.02	1.11	0.00	0.46
BROWNS FERRY 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BROWNS FERRY 2	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00
BROWNS FERRY 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BRUNSWICK 1	0.47	0.00	0.00	0.00	0.00	2.08	0.00	0.00
BRUNSWICK 2	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00
BYRON 1	1.61	0.00	0.00	0.67	1.33	0.00	0.00	0.00
BYRON 2	0.51	0.64	0.46	0.47	0.46	0.46	0.00	0.00
CALLAWAY	0.00	0.00	0.96	0.53	0.46	0.00	0.00	1.08
CALVERT CLIFFS 1	1.61	0.50	0.00	0.00	0.94	0.00	0.00	0.00
CALVERT CLIFFS 2	0.47	0.48	0.74	0.49	0.00	0.00	0.00	0.00
CATAWBA 1	0.49	0.00	0.00	0.00	0.00	0.00	0.78	0.00
CATAWBA 2	1.32	0.00	2.65	1.60	0.00	0.00	1.31	0.00
CLINTON 1	2.67	0.85	0.00	0.71	0.00	0.52	0.00	2.35
COOK 1	0.00	0.48	0.47	0.00	0.00	0.95	0.55	0.00
COOK 2	1.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COOPER STATION	0.00	0.00	0.77	0.00	0.47	0.00	0.52	0.00
CRYSTAL RIVER 3	1.34	0.00	0.52	0.00	0.00	0.87	0.00	0.00
DAVIS-BESSE	1.04	0.46	0.00	0.00	0.00	2.15	0.51	0.46
DIABLO CANYON 1	0.00	0.47	0.65	0.00	1.03	0.00	0.00	0.00
DIABLO CANYON 2	0.00	0.00	0.47	0.00	0.79	0.00	0.00	0.51
DRESDEN 2	1.03	0.46	0.00	0.00	0.00	0.00	1.08	0.00
DRESDEN 3	1.73	0.00	0.00	0.00	0.00	0.52	0.98	0.65
DUANE ARNOLD	0.00	0.00	0.00	0.00	0.48	0.00	1.15	0.48
FARLEY 1	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.00
FARLEY 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.09
FERMI 2	1.54	0.50	0.88	0.80	1.01	0.00	0.53	0.00
FITZPATRICK	1.49	0.93	0.00	0.00	0.00	0.00	0.00	0.00
FORT CALHOUN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FORT ST. VRAIN	0.00	2.02	0.00	0.65	0.00	0.00	0.00	0.00
GINNA	0.00	0.00	0.86	0.47	0.00	0.00	0.00	1.41
GRAND GULF	0.47	0.00	1.52	0.00	0.93	0.46	0.00	0.00
HADDAM NECK	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00
HATCH 1	0.92	0.00	0.47	1.65	0.47	1.90	0.00	0.00
HATCH 2	1.00	0.00	0.00	2.04	0.46	0.00	0.00	0.00
HOPE CREEK	1.68	0.62	0.00	0.53	0.46	1.00	0.00	0.00
INDIAN POINT 2	0.00	0.00	0.00	0.51	0.00	0.92	0.55	0.00
INDIAN POINT 3	0.00	0.46	0.46	0.60	0.00	0.78	0.00	0.00
KEWAUNEE	0.45	0.00	0.68	1.04	0.00	0.00	0.00	0.00
LASALLE 1	0.00	0.47	0.00	0.00	0.00	0.00	0.48	0.00
LASALLE 2	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00
LIMERICK 1	2.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LIMERICK 2	NA	NA	NA	NA	NA	NA	NA	NA
MAINE YANKEE	0.90	0.00	0.46	0.00	0.48	1.97	0.51	0.46

**TABLE 9.3 AUTOMATIC SCRAMS >15 (CONTINUED)**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
MCGUIRE 1	0.00	0.86	0.93	0.47	0.00	0.00	0.00	0.00
MCGUIRE 2	0.97	0.92	0.46	0.00	0.00	0.00	0.93	0.46
MILLSTONE 1	1.84	0.00	0.46	0.00	0.00	0.00	0.00	1.12
MILLSTONE 2	0.92	0.46	0.00	0.00	0.00	0.46	0.00	0.00
MILLSTONE 3	0.46	0.00	0.74	0.54	0.00	1.14	0.00	1.13
MONTICELLO	0.45	0.00	0.00	0.00	0.00	0.46	0.00	0.48
NINE MILE PT. 1	0.00	1.23	0.00	0.00	0.00	0.00	0.00	0.00
NINE MILE PT. 2	0.00	1.80	2.07	1.56	0.56	0.00	0.00	0.99
NORTH ANNA 1	0.00	0.60	0.00	0.00	0.46	0.00	0.75	0.00
NORTH ANNA 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OCONEE 1	0.00	0.00	0.00	0.00	0.46	0.00	0.92	0.00
OCONEE 2	0.00	0.00	0.00	0.00	0.51	0.00	0.93	0.87
OCONEE 3	0.00	0.00	0.00	0.00	0.00	0.91	0.48	0.00
OYSTER CREEK	0.63	0.00	0.00	0.00	0.00	0.00	0.00	1.87
PALISADES	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PALO VERDE 1	0.00	0.00	0.00	1.00	3.07	0.00	0.66	0.00
PALO VERDE 2	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00
PALO VERDE 3	NA	1.06	0.00	0.00	0.00	0.00	0.90	0.00
PEACH BOTTOM 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.74
PEACH BOTTOM 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERRY	1.29	0.71	0.00	3.92	0.00	0.00	0.00	0.00
PILGRIM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.79
POINT BEACH 1	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00
POINT BEACH 2	0.46	0.00	0.00	0.46	0.00	0.00	0.47	0.00
PRAIRIE ISLAND 1	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PRAIRIE ISLAND 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66
QUAD CITIES 1	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.51
QUAD CITIES 2	1.47	1.07	0.97	0.00	0.00	0.00	0.00	0.47
RANCHO SECO	0.00	0.00	0.00	0.51	0.00	1.30	1.11	0.00
RIVER BEND	0.00	0.00	0.99	0.00	0.95	0.00	0.60	0.00
ROBINSON 2	1.71	0.00	0.84	0.99	0.00	0.00	3.38	0.00
SALEM 1	0.00	0.00	0.00	0.00	0.49	0.00	0.54	4.48
SALEM 2	0.65	0.00	0.00	1.94	1.39	3.29	1.12	0.52
SAN ONOFRE 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SAN ONOFRE 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SAN ONOFRE 3	0.00	0.46	0.00	0.00	0.00	0.00	0.47	0.52
SEABROOK	NA	NA	NA	NA	NA	NA	NA	0.00
SEQUOYAH 1	0.00	0.00	0.00	0.00	0.00	2.63	0.47	0.00
SEQUOYAH 2	0.00	0.00	0.00	5.10	0.00	0.00	0.00	1.78
SHEARON HARRIS	1.15	0.00	0.50	0.00	0.00	0.00	2.41	0.00
SHOREHAM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOUTH TEXAS 1	NA	NA	0.00	0.00	1.73	0.00	1.77	0.00
SOUTH TEXAS 2	NA	NA	NA	NA	NA	NA	0.00	1.41
ST. LUCIE 1	0.00	1.01	0.46	0.46	0.98	0.00	0.00	0.00
ST. LUCIE 2	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.64
SUMMER	1.02	0.46	0.47	1.02	0.55	0.00	0.00	0.56
SURRY 1	0.51	0.00	0.47	0.00	0.69	0.00	0.00	0.00
SURRY 2	0.00	0.00	0.00	0.81	0.00	0.00	0.00	0.00
SUSQUEHANNA 1	0.00	0.00	0.52	0.51	0.00	0.00	1.16	0.00
SUSQUEHANNA 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**TABLE 9.3 AUTOMATIC SCRAMS >15 (CONTINUED)**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
THREE MILE ISL. 1	0.46	0.00	0.00	0.00	0.00	0.54	0.00	0.00
TROJAN	1.18	0.00	0.49	0.00	1.11	0.56	0.00	0.00
TURKEY POINT 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TURKEY POINT 4	0.00	0.00	0.00	0.00	0.55	0.00	0.00	0.00
VERMONT YANKEE	0.00	3.94	0.00	0.99	0.00	0.00	0.00	0.00
VOGTLE 1	1.44	1.22	1.23	0.48	1.40	0.00	0.00	0.46
VOGTLE 2	NA	NA	NA	NA	NA	NA	0.00	1.12
WASH. NUCLEAR 2	1.21	0.00	0.66	0.00	0.00	0.00	0.49	1.30
WATERFORD 3	0.53	0.51	0.00	1.29	0.00	0.63	0.00	0.00
WOLF CREEK	1.53	0.00	0.00	0.00	0.00	0.00	0.95	0.00
YANKEE-ROWE	0.00	0.00	0.94	0.47	0.00	0.00	0.00	0.47
ZION 1	0.00	0.00	0.77	0.00	0.48	0.00	0.65	0.00
ZION 2	0.00	0.00	0.00	0.00	0.00	4.65	0.00	0.00

NA - The plant is not yet critical.

**TABLE 9.4 AUTOMATIC SCRAMS <=15%**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
ARKANSAS 1	1	0	0	0	0	0	0	0
ARKANSAS 2	0	0	0	0	0	0	0	0
BEAVER VALLEY 1	0	0	0	1	0	0	0	0
BEAVER VALLEY 2	2	1	0	0	0	0	0	0
BIG ROCK POINT	0	0	0	0	0	0	0	0
BRAIDWOOD 1	2	0	0	0	0	0	0	0
BRAIDWOOD 2	NA	NA	0	1	1	1	0	0
BROWNS FERRY 1	0	0	0	0	0	0	0	0
BROWNS FERRY 2	0	0	0	0	0	0	0	0
BROWNS FERRY 3	0	0	0	0	0	0	0	0
BRUNSWICK 1	0	0	0	0	0	0	0	0
BRUNSWICK 2	0	0	0	0	0	0	0	0
BYRON 1	1	0	0	0	0	0	0	0
BYRON 2	0	1	0	0	1	0	0	0
CALLAWAY	0	1	0	1	0	0	0	0
CALVERT CLIFFS 1	0	0	0	0	0	0	0	0
CALVERT CLIFFS 2	1	0	0	0	0	0	0	0
CATAWBA 1	0	0	0	0	0	0	0	0
CATAWBA 2	0	0	0	0	0	0	0	0
CLIXTON 1	0	0	0	0	0	0	0	0
COCK 1	0	0	0	0	0	0	1	0
COCK 2	0	1	0	0	0	0	0	0
COOPER STATION	0	0	0	0	0	0	0	0
CRYSTAL RIVER 3	0	0	0	0	0	0	0	1
DAVIS-BESSE	0	0	0	0	0	0	0	0
DIABLO CANYON 1	0	0	0	0	2	0	0	0
DIABLO CANYON 2	1	0	0	0	0	0	0	0
DRESDEN 2	0	0	0	0	0	0	0	0
DRESDEN 3	0	0	0	0	0	0	0	0
DUANE ARNOLD	0	0	0	0	0	0	0	0
FARLEY 1	0	0	0	0	0	0	0	0
FARLEY 2	0	1	0	0	0	0	0	0
FERMI 2	1	0	0	1	0	0	0	0
FITZPATRICK	0	0	0	0	0	0	0	0
FORT CALHOUN	0	0	0	0	0	0	0	0
FORT ST. VRAIN	0	0	0	0	0	0	0	0
SINNA	0	0	0	0	0	0	0	0
GRAND GULF	0	0	0	0	0	0	0	1
HADDAM NECK	0	0	2	0	0	0	0	0
HATCH 1	0	0	0	0	0	0	0	0
HATCH 2	0	0	1	0	0	0	0	0
HOPE CREEK	0	0	0	0	0	0	0	0
INDIAN POINT 2	0	0	1	0	0	0	0	0
INDIAN POINT 3	0	0	0	0	0	0	0	0
KEWAUNEE	0	0	0	0	0	0	0	0
LASALLE 1	1	0	0	0	0	0	0	0
LASALLE 2	0	0	0	0	0	0	0	0
LIMERICK 1	0	0	0	1	0	0	0	0
LIMERICK 2	NA	NA	NA	NA	NA	NA	NA	NA
MAINE YANKEE	0	0	0	0	0	0	0	0

**TABLE 9.4 AUTOMATIC SCRAMS  $\leq 15\%$  (CONTINUED)**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
MCQUIRE 1	1	0	0	0	0	0	0	0
MCQUIRE 2	0	0	0	0	0	0	0	0
MILLSTONE 1	1	0	0	0	0	0	0	1
MILLSTONE 2	0	0	0	0	0	0	0	0
MILLSTONE 3	0	0	0	0	0	0	0	0
MONTICELLO	0	0	0	0	0	0	0	0
NINE MILE PT. 1	0	0	0	0	0	0	0	0
NINE MILE PT. 2	1	1	0	1	0	0	0	0
NORTH ANNA 1	0	0	2	0	0	0	0	0
NORTH ANNA 2	0	0	0	0	0	0	0	0
OCONEE 1	0	0	0	0	0	0	0	0
OCONEE 2	0	0	0	0	0	0	0	0
OCONEE 3	0	0	0	0	0	0	0	0
CYSTER CREEK	0	0	0	0	0	0	0	0
PALISADES	0	0	0	0	0	0	0	0
PALO VERDE 1	1	0	0	0	0	0	0	0
PALO VERDE 2	0	1	0	0	0	1	0	0
PALO VERDE 3	NA	0	0	0	0	0	0	0
PEACH BOTTOM 2	0	0	0	0	0	0	0	0
PEACH BOTTOM 3	0	0	0	0	0	0	0	0
PERRY	0	0	1	1	0	0	0	0
PILGRIM	0	0	0	0	0	0	1	0
POINT BEACH 1	0	0	0	0	0	0	0	0
POINT BEACH 2	0	0	0	0	0	0	0	0
PRAIRIE ISLAND 1	0	0	0	0	0	0	0	0
PRAIRIE ISLAND 2	0	0	0	0	0	0	0	0
QUAD CITIES 1	0	0	0	0	0	0	0	0
QUAD CITIES 2	0	0	0	0	0	0	0	0
RANCHO SECO	0	0	0	0	0	0	0	0
RIVER BEND	0	1	1	0	0	0	1	0
ROBINSON 2	1	0	0	0	0	0	0	0
SALEM 1	0	0	1	0	0	0	1	0
SALEM 2	0	0	0	0	0	0	0	0
SAN ONOFRE 1	0	0	0	0	0	0	0	0
SAN ONOFRE 2	0	0	0	0	0	0	0	0
SAN ONOFRE 3	0	0	0	0	0	0	0	0
SEABROOK	NA	NA	NA	NA	NA	NA	NA	0
SEQUOYAH 1	0	0	0	0	0	1	0	0
SEQUOYAH 2	0	0	0	1	0	0	0	0
SHEARON HARRIS	0	1	0	0	0	0	0	0
SHOREHAM	0	0	0	0	0	0	0	0
SOUTH TEXAS 1	NA	NA	1	0	0	0	0	0
SOUTH TEXAS 2	NA	NA	NA	NA	NA	NA	0	1
ST. LUCIE 1	0	0	0	0	0	0	0	0
ST. LUCIE 2	0	0	0	0	0	0	0	0
SUMMER	0	0	0	0	0	0	0	0
SURRY 1	0	0	0	0	0	0	0	0
SURRY 2	0	0	0	0	1	0	0	0
SUSQUEHANNA 1	0	0	0	0	0	0	0	0
SUSQUEHANNA 2	0	0	0	0	0	0	0	0

**TABLE 9.4 AUTOMATIC SCRAMS  $\leq 15\%$  (CONTINUED)**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
THREE MILE ISL. 1	0	0	0	0	0	0	0	0
TROJAN	0	0	0	0	0	0	0	0
TURKEY POINT 3	1	0	0	0	0	0	1	0
TURKEY POINT 4	0	0	0	0	0	0	0	0
VERMONT YANKEE	1	0	0	0	1	0	0	0
VOGTLE 1	0	0	0	0	0	0	0	0
VOGTLE 2	NA	NA	NA	NA	NA	NA	0	1
WASH. NUCLEAR 2	0	0	0	0	0	0	0	0
WATERFORD 3	0	0	1	0	0	0	0	0
WOLF CREEK	0	0	0	0	0	0	0	0
YANKEE-ROME	1	0	0	0	0	0	0	0
ZION 1	0	0	0	1	1	0	0	0
ZION 2	0	0	0	0	0	0	0	0

NA - The plant is not yet critical.



**TABLE 9.5 SAFETY SYSTEM ACTUATIONS**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
ARKANSAS 1	1	0	0	0	0	0	1	0
ARKANSAS 2	0	0	2	1	1	0	0	0
BEAVER VALLEY 1	0	0	0	1	0	0	0	1
BEAVER VALLEY 2	3	2	2	0	0	0	1	2
BIG ROCK POINT	0	0	1	0	0	1	0	0
BRAIDWOOD 1	2	0	1	0	0	1	0	1
BRAIDWOOD 2	NA	0	1	0	0	0	0	0
BROWNS FERRY 1	0	0	1	1	0	3	1	0
BROWNS FERRY 2	0	0	0	0	0	2	1	0
BROWNS FERRY 3	0	1	0	0	0	1	0	0
BRUNSWICK 1	2	0	0	0	0	1	0	0
BRUNSWICK 2	0	0	0	0	0	1	1	3
BYRON 1	1	0	0	0	0	0	0	0
BYRON 2	1	2	0	0	0	0	1	0
CALLAWAY	0	2	1	0	0	1	0	2
CALVERT CLIFFS 1	1	0	0	4	0	0	2	0
CALVERT CLIFFS 2	1	0	0	0	0	0	0	0
CATAWBA 1	0	1	1	0	0	0	2	0
CATAWBA 2	0	0	2	0	0	0	2	0
CLINTON 1	0	1	0	0	1	0	0	0
COOK 1	0	0	0	0	0	0	0	0
COOK 2	1	1	0	0	0	0	0	0
COOPER STATION	2	0	1	2	2	0	0	2
CRYSTAL RIVER 3	0	6	0	0	0	2	0	4
DAVIS-BESSE	1	0	0	0	0	0	0	0
DIABLO CANYON 1	1	0	0	1	1	0	0	0
DIABLO CANYON 2	2	0	0	0	2	1	0	0
DRESDEN 2	0	0	0	0	0	0	1	0
DRESDEN 3	0	0	0	0	0	0	2	0
DUANE ARNOLD	0	0	0	0	0	2	2	0
FARLEY 1	0	0	0	0	0	0	0	0
FARLEY 2	0	2	0	0	0	0	0	1
FERMI 2	0	0	1	2	0	0	1	0
FITZPATRICK	1	0	0	0	0	1	0	0
FORT CALHOUN	0	0	0	0	0	1	0	0
FORT ST. VRAIN	0	2	0	0	0	0	0	0
GINNA	0	0	0	1	1	0	0	2
GRAND GULF	1	1	1	0	0	1	1	0
HADDAM NECK	0	0	0	0	0	0	0	1
HATCH 1	2	0	0	0	1	2	0	0
HATCH 2	2	0	0	1	1	0	0	0
HOPE CREEK	5	0	0	2	2	2	0	2
INDIAN POINT 2	0	2	1	0	0	0	0	0
INDIAN POINT 3	1	0	0	0	0	1	1	0
KEWAUNEE	0	0	2	0	0	0	0	0
LASALLE 1	0	0	0	0	0	0	0	0
LASALLE 2	0	0	0	0	0	0	2	1
LIMERICK 1	2	0	0	0	0	0	0	0
LIMERICK 2	NA	NA	NA	NA	NA	NA	NA	0
MAINE YANKEE	0	0	0	0	1	2	0	0

**TABLE 9.5 SAFETY SYSTEM ACTUATIONS (CONTINUED)**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
MCGUIRE 1	3	0	1	0	0	1	1	0
MCGUIRE 2	0	0	0	1	0	0	0	0
MILLSTONE 1	1	0	0	0	0	0	0	1
MILLSTONE 2	0	0	3	0	0	1	0	1
MILLSTONE 3	0	1	1	0	0	0	1	0
MONTICELLO	0	0	0	0	0	0	0	0
NINE MILE PT. 1	0	5	1	0	0	0	1	0
NINE MILE PT. 2	0	1	3	0	1	2	3	1
NORTH ANNA 1	1	0	0	0	1	0	1	1
NORTH ANNA 2	0	3	0	0	1	0	0	1
OCONEE 1	0	0	0	0	0	0	0	0
OCONEE 2	0	0	0	0	0	0	0	0
OCONEE 3	0	0	0	0	0	0	0	0
OYSTER CREEK	0	0	0	0	0	1	0	1
PALISADIS	2	1	0	0	0	0	0	0
PALO VERDE 1	0	0	1	0	1	0	0	0
PALO VERDE 2	0	0	2	0	1	0	2	0
PALO VERDE 3	0	0	0	1	0	0	1	0
PEACH BOTTOM 2	0	0	1	0	1	1	0	1
PEACH BOTTOM 3	0	1	0	0	2	0	0	0
PERRY	1	1	0	1	0	1	0	0
PILGRIM	0	1	0	0	1	0	1	2
POINT BEACH 1	0	1	0	0	0	0	0	0
POINT BEACH 2	0	0	0	2	0	0	1	0
PRAIRIE ISLAND 1	2	0	0	0	0	0	0	0
PRAIRIE ISLAND 2	0	0	0	0	0	0	0	0
QUAD CITIES 1	0	0	0	0	0	0	0	0
QUAD CITIES 2	0	3	0	1	0	1	0	0
RANCHO SECO	0	0	1	1	0	1	1	0
RIVER BEND	0	0	1	0	2	0	0	2
ROBINSON 2	0	0	1	0	0	0	1	0
SALEM 1	0	0	0	0	0	0	1	1
SALEM 2	0	0	0	1	0	0	1	0
SAN ONOFRE 1	0	0	0	0	0	0	0	0
SAN ONOFRE 2	0	0	0	0	0	0	0	0
SAN ONOFRE 3	0	0	1	0	0	0	1	0
SEABROOK	1	0	0	0	1	0	0	0
SEQUOYAH 1	1	0	0	1	0	0	0	0
SEQUOYAH 2	0	0	1	0	1	0	2	0
SHEARON HARRIS	1	2	0	1	0	1	0	0
SHOREHAM	1	0	0	1	1	0	0	0
SOUTH TEXAS 1	0	2	4	0	1	2	1	0
SOUTH TEXAS 2	NA	NA	NA	NA	NA	0	3	3
ST. LUCIE 1	0	0	1	0	0	0	0	0
ST. LUCIE 2	0	0	0	0	0	0	0	0
SUMMER	0	0	0	1	0	1	0	0
SURRY 1	2	0	0	0	1	0	2	2
SURRY 2	0	0	1	1	0	0	1	2
SUSQUEHANNA 1	0	0	0	0	0	0	0	0
SUSQUEHANNA 2	0	0	0	0	0	0	0	0

**TABLE 9.5 SAFETY SYSTEM ACTUATIONS (CONTINUED)**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
THREE MILE ISL. 1	0	0	0	0	0	0	0	0
TROJAN	0	0	0	0	1	0	0	0
TURKEY POINT 3	2	0	0	0	0	0	0	2
TURKEY POINT 4	0	0	0	0	0	0	0	1
VERMONT YANKEE	1	0	0	0	0	0	2	0
VOGTLE 1	0	0	0	0	0	1	0	0
VOGTLE 2	NA	NA	NA	NA	NA	NA	1	0
WASH. NUCLEAR 2	1	0	0	0	0	0	1	2
WATERFORD 3	0	0	0	0	0	0	1	0
WOLF CREEK	2	2	0	0	0	0	0	0
YANKEE-ROWE	0	0	0	1	0	1	0	0
ZION 1	0	0	0	0	1	0	0	0
ZION 2	0	0	0	0	0	1	0	0

NA - The plant is not yet licensed.

**TABLE 9.6 SIGNIFICANT EVENT FREQUENCY**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
ARKANSAS 1	1	0	0	0	0	2	1	0
ARKANSAS 2	0	0	0	0	1	0	0	1
BEAVER VALLEY 1	0	0	0	0	0	0	0	0
BEAVER VALLEY 2	0	1	0	0	0	0	0	0
BIG ROCK POINT	0	0	0	0	0	0	0	0
BRAIDWOOD 1	0	0	1	0	0	0	0	1
BRAIDWOOD 2	NA	0	1	0	0	0	0	1
BROWNS FERRY 1	0	0	0	0	0	0	2	0
BROWNS FERRY 2	0	1	0	0	0	0	2	0
BROWNS FERRY 3	0	0	0	1	0	0	2	0
BRUNSWICK 1	1	0	1	0	1	1	0	0
BRUNSWICK 2	0	0	3	0	1	1	0	1
BYRON 1	0	0	0	0	1	0	0	0
BYRON 2	0	1	0	0	0	0	1	0
CALLAWAY	1	0	0	0	0	0	0	0
CALVERT CLIFFS 1	1	0	0	1	0	0	0	0
CALVERT CLIFFS 2	1	0	0	1	0	0	1	1
CATAWBA 1	0	0	0	2	0	0	0	0
CATAWBA 2	0	0	1	1	0	0	0	0
CLINTON 1	0	0	0	0	0	1	0	1
COOK 1	1	0	0	0	1	0	0	0
COOK 2	1	0	0	0	1	0	0	0
COOPER STATION	0	0	0	0	0	0	0	0
CRYSTAL RIVER 3	0	1	1	1	0	0	1	1
DAVIS-BESSE	1	0	0	0	0	0	0	0
DIABLO CANYON 1	0	0	0	0	0	0	1	0
DIABLO CANYON 2	0	0	0	0	0	1	1	0
DRESDEN 2	0	0	0	1	0	1	1	0
DRESDEN 3	1	0	0	0	0	0	0	0
DUANE ARNOLD	0	0	0	0	0	1	0	0
FARLEY 1	0	0	0	0	0	0	0	0
FARLEY 2	0	2	0	0	0	0	0	0
FERMI 2	1	0	0	1	1	0	1	0
FITZPATRICK	0	0	0	0	1	1	0	0
FORT CALHOUN	1	0	0	1	0	0	0	0
FORT ST. VRAIN	0	1	0	1	0	0	0	0
GINNA	0	0	0	0	0	0	0	0
GRAND GULF	0	0	0	0	1	0	0	0
HADDAM NECK	0	0	0	1	0	0	0	0
HATCH 1	0	0	0	0	0	0	0	0
HATCH 2	0	0	0	0	0	0	0	0
HOPKINS CREEK	0	1	0	0	0	0	0	0
INDIAN POINT 2	0	0	2	1	0	0	0	2
INDIAN POINT 3	0	0	0	0	0	0	0	0
KEWAUNEE	0	0	0	0	0	0	0	0
LASALLE 1	0	0	0	0	0	0	1	0
LASALLE 2	0	0	1	0	0	0	1	0
LIMERICK 1	0	0	0	0	0	2	1	0
LIMERICK 2	NA	NA	NA	NA	NA	NA	NA	0
MAINE YANKEE	0	0	0	0	1	0	0	0

**TABLE 9.6 SIGNIFICANT EVENT FREQUENCY (CONTINUED)**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
MCGUIRE 1	1	0	0	0	0	2	1	0
MCGUIRE 2	1	0	0	0	0	1	0	0
MILLSTONE 1	0	0	0	0	0	0	1	1
MILLSTONE 2	0	0	0	1	0	1	0	0
MILLSTONE 3	0	0	1	1	0	0	0	0
MONTICELLO	0	0	0	0	0	0	0	0
NINE MILE PT. 1	0	1	0	0	0	1	0	0
NINE MILE PT. 2	0	0	1	0	0	0	2	0
NORTH ANNA 1	1	0	0	0	0	0	2	0
NORTH ANNA 2	0	1	0	0	0	0	1	0
OCONEE 1	0	0	0	0	0	0	1	1
OCONEE 2	0	0	0	1	0	0	0	1
OCONEE 3	0	0	0	0	1	0	1	1
OYSTER CREEK	1	0	0	0	1	1	0	0
PALISADES	1	0	0	0	1	0	0	0
PALO VERDE 1	1	0	0	0	1	0	0	0
PALO VERDE 2	0	0	0	0	0	0	0	0
PALO VERDE 3	0	0	0	0	0	0	1	0
PEACH BOTTOM 2	0	0	0	1	1	0	0	0
PEACH BOTTOM 3	0	0	0	1	1	0	0	0
PERRY	0	2	0	2	1	0	1	0
PILGRIM	0	1	0	0	0	0	1	1
POINT BEACH 1	0	0	0	1	0	0	0	0
POINT BEACH 2	1	0	0	0	0	0	0	0
PRAIRIE ISLAND 1	0	0	0	0	0	0	0	0
PRAIRIE ISLAND 2	0	0	0	0	0	0	0	0
QUAD CITIES 1	0	0	0	0	0	0	0	1
QUAD CITIES 2	0	0	0	0	0	0	0	0
RANCHO SECO	0	0	1	0	0	0	2	0
RIVER BEND	1	0	0	0	1	0	0	1
ROBINSON 2	0	0	0	0	0	0	1	0
SALEM 1	0	1	0	0	0	0	0	1
SALEM 2	1	1	0	1	0	0	0	0
SAN ONOFRE 1	0	0	0	0	0	2	2	0
SAN ONOFRE 2	1	0	0	0	0	1	0	0
SAN ONOFRE 3	0	0	0	0	0	1	0	0
SEABROOK	0	0	0	0	0	0	0	0
SEQUOYAH 1	0	0	0	0	0	0	0	0
SEQUOYAH 2	0	0	0	0	0	0	0	0
SHEARON HARRIS	0	1	0	0	1	0	0	0
SHOREHAM	0	0	0	0	0	0	0	0
SOUTH TEXAS 1	0	0	0	1	0	0	0	0
SOUTH TEXAS 2	NA	NA	NA	NA	NA	0	0	0
ST. LUCIE 1	0	0	0	0	0	0	0	0
ST. LUCIE 2	0	0	0	0	0	0	0	0
SUMMER	0	0	0	0	0	0	0	1
SURRY 1	0	0	0	1	0	0	3	0
SURRY 2	0	0	1	1	1	1	3	0
SUSQUEHANNA 1	1	0	0	0	0	0	0	0
SUSQUEHANNA 2	0	0	1	0	0	0	0	0

**TABLE 9.6 SIGNIFICANT EVENT FREQUENCY (CONTINUED)**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
THREE MILE ISL. 1	0	0	1	0	0	0	0	0
TRCJAN	0	0	0	0	1	0	0	1
TURKEY POINT 3	0	0	0	0	0	0	1	0
TURKEY POINT 4	0	0	0	0	0	0	0	0
VERMONT YANKEE	0	0	0	0	1	0	0	0
VOGTLE 1	0	0	1	0	0	0	0	0
VOGTLE 2	NA	NA	NA	NA	NA	NA	1	0
WASH. NUCLEAR 2	0	0	2	0	1	0	0	0
WATERFORD 3	0	0	0	1	0	0	0	0
WOLF CREEK	0	0	0	0	0	2	0	0
YANKEE-ROWE	0	0	0	0	0	0	0	0
ZION 1	0	0	0	0	0	1	0	0
ZION 2	0	0	0	0	0	1	0	0

NA - The plant is not yet licensed.

**TABLE 9.7 SAFETY SYSTEM FAILURES**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
ARKANSAS 1	0	0	1	0	2	2	1	0
ARKANSAS 2	0	0	1	1	0	2	1	0
BEAVER VALLEY 1	0	0	0	0	0	0	0	0
BEAVER VALLEY 2	2	0	0	0	0	0	0	0
BIG ROCK POINT	0	0	0	0	0	0	1	0
BRAIDWOOD 1	1	1	0	0	0	0	0	0
BRAIDWOOD 2	NA	0	0	0	1	0	1	0
BROWNS FERRY 1	2	0	2	0	2	1	1	0
BROWNS FERRY 2	3	0	2	0	2	1	2	1
BROWNS FERRY 3	2	0	2	1	2	1	1	0
BRUNSWICK 1	2	2	2	5	4	5	2	1
BRUNSWICK 2	0	1	3	3	3	2	2	1
BYRON 1	0	0	0	0	0	0	0	0
BYRON 2	0	0	0	0	0	0	0	0
CALLAWAY	3	2	1	0	0	1	0	0
CALVERT CLIFFS 1	0	0	0	0	0	0	1	1
CALVERT CLIFFS 2	0	0	0	0	0	0	0	1
CATAWBA 1	0	1	2	0	0	2	1	0
CATAWBA 2	0	1	1	1	0	1	1	0
CLINTON 1	3	3	1	3	0	3	2	1
COOK 1	2	0	0	0	1	1	0	0
COOK 2	0	0	0	1	0	1	0	0
COOPER STATION	1	0	0	0	1	0	4	2
CRYSTAL RIVER 3	2	1	0	0	0	0	2	0
DAVIS-BEESE	0	1	1	0	2	0	0	1
DIABLO CANYON 1	0	0	0	0	0	1	1	0
DIABLO CANYON 2	0	1	0	0	0	1	2	0
DRESDEN 2	1	2	0	4	2	0	2	0
DRESDEN 3	6	0	0	0	0	0	1	2
DUANE ARNOLD	1	1	2	2	0	0	4	0
FARLEY 1	0	1	0	1	0	0	0	0
FARLEY 2	0	0	1	1	0	0	0	0
FERMI 2	4	1	4	1	3	0	3	0
FITZPATRICK	3	0	2	1	1	3	4	3
FORT CALHOUN	1	0	0	2	1	2	0	0
FORT ST. VRAIN	0	0	0	0	1	0	1	0
GINNA	0	1	0	0	0	0	0	0
GRAND GULF	0	0	0	0	1	1	0	2
HADDAM NECK	1	0	3	2	0	1	2	4
HATCH 1	2	1	1	1	1	4	1	1
HATCH 2	3	2	3	2	0	2	0	1
HOPE CREEK	2	0	0	2	3	2	0	3
INDIAN POINT 2	0	0	0	1	0	1	1	0
INDIAN POINT 3	1	0	0	1	0	0	0	0
KEWAUNEE	0	0	0	1	0	0	1	0
LASALLE 1	1	2	0	0	2	0	1	1
LASALLE 2	0	4	0	2	2	0	1	1
LIMERICK 1	1	2	2	1	0	1	8	4
LIMERICK 2	NA	NA	NA	NA	NA	NA	NA	0
MAINE YANKEE	0	0	0	1	0	1	0	0

**TABLE 9.7 SAFETY SYSTEM FAILURES (CONTINUED)**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
MCGUIRE 1	2	4	0	0	3	4	2	0
MCGUIRE 2	1	3	0	1	1	1	1	0
MILLSTONE 1	5	0	1	1	1	1	2	4
MILLSTONE 2	0	0	1	0	0	0	0	0
MILLSTONE 3	0	1	3	0	0	1	0	0
MONTICELLO	0	1	0	0	0	0	1	3
NINE MILE PT. 1	1	0	2	0	0	1	0	0
NINE MILE PT. 2	5	6	1	1	4	2	0	0
NORTH ANNA 1	0	0	1	0	0	1	1	1
NORTH ANNA 2	3	0	0	1	0	1	0	1
OCONEE 1	0	1	1	1	0	0	3	3
OCONEE 2	0	0	1	2	0	0	2	3
OCONEE 3	0	0	1	1	2	0	3	2
OYSTER CREEK	2	3	2	0	3	1	3	0
PALISADES	0	2	0	1	1	2	1	1
PALO VERDE 1	0	0	2	1	2	0	0	0
PALO VERDE 2	0	0	2	0	2	0	0	0
PALO VERDE 3	1	0	1	0	2	0	0	1
PEACH BOTTOM 2	5	2	1	0	2	0	3	3
PEACH BOTTOM 3	2	1	0	0	2	0	1	0
PERRY	8	5	1	2	4	4	3	2
PILGRIM	1	1	1	0	1	0	2	4
POINT BEACH 1	1	0	1	0	2	1	1	3
POINT BEACH 2	1	0	0	0	2	1	0	1
PRAIRIE ISLAND 1	0	1	1	0	0	0	0	0
PRAIRIE ISLAND 2	0	1	1	0	0	1	0	0
QUAD CITIES 1	2	3	1	2	1	0	1	2
QUAD CITIES 2	1	1	2	3	0	0	0	2
RANCHO SECO	3	2	0	1	0	0	4	0
RIVER BEND	2	1	0	0	0	1	1	1
ROBINSON 2	4	5	1	1	2	2	0	1
SALEM 1	2	2	1	1	0	1	2	2
SALEM 2	2	4	0	2	2	1	0	0
SAN ONOFRE 1	1	0	1	1	0	1	4	0
SAN ONOFRE 2	0	0	1	1	2	1	0	0
SAN ONOFRE 3	0	0	1	1	2	1	0	1
SEABROOK	1	0	0	0	0	1	1	0
SEQUOYAH 1	7	4	2	1	1	0	1	1
SEQUOYAH 2	6	4	5	0	2	0	1	1
SHEARON HARRIS	3	1	2	3	3	0	0	0
SHOREHAM	1	0	0	0	0	0	0	0
SOUTH TEXAS 1	0	4	4	4	1	2	0	0
SOUTH TEXAS 2	NA	NA	NA	NA	NA	0	1	0
ST. LUCIE 1	0	1	0	0	0	0	0	0
ST. LUCIE 2	0	0	0	0	0	0	0	0
SUMMER	2	1	0	1	0	0	2	0
SURRY 1	0	2	0	2	2	2	2	0
SURRY 2	0	0	0	0	2	4	2	0
SUSQUEHANNA 1	0	0	0	1	1	1	0	0
SUSQUEHANNA 2	0	0	2	0	1	0	1	0



**TABLE 9.7 SAFETY SYSTEM FAILURES (CONTINUED)**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
THREE MILE ISL 1	0	0	0	0	0	0	0	0
TROJAN	0	1	0	2	3	0	0	4
TURKEY POINT 3	1	1	0	2	3	1	1	0
TURKEY POINT 4	1	2	1	2	2	1	1	0
VERMONT YANKEE	0	2	1	0	0	0	3	2
VOGTLE 1	2	1	0	1	0	0	3	0
VOGTLE 2	NA	NA	NA	NA	NA	NA	2	0
WASH. NUCLEAR 2	0	0	1	3	0	0	1	3
WATERFORD 3	0	0	0	0	0	0	1	0
WOLF CREEK	2	1	0	0	0	1	0	1
YANKEE-ROWE	0	0	2	0	0	2	0	0
ZION 1	0	0	1	1	0	1	1	1
ZION 2	0	0	0	0	0	1	0	1

NA - The plant is not yet licensed.

**TABLE 9.8 FORCED OUTAGE RATE(%)**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
ARKANSAS 1	4	1	2	0	0	38	77	21
ARKANSAS 2	12	1	0	3	21	1	8	29
BEAVER VALLEY 1	0	0	0	4	1	9	2	4
BEAVER VALLEY 2	NA	11	4	2	5	0	8	41
BIG ROCK POINT	5	9	8	17	8	6	0	0
BRAIDWOOD 1	NA	NA	NA	NA	11	7	4	4
BRAIDWOOD 2	NA	NA	NA	NA	NA	18	0	2
BROWNS FERRY 1	100	100	100	100	100	100	100	100
BROWNS FERRY 2	100	100	100	100	100	100	100	100
BROWNS FERRY 3	100	100	100	100	100	100	100	100
BRUNSWICK 1	4	0	0	0	9	5	0	26
BRUNSWICK 2	0	0	0	20	0	4	0	12
BYRON 1	6	0	0	4	4	0	1	0
BYRON 2	22	4	1	4	2	1	0	8
CALLAWAY	0	5	6	5	1	0	0	3
CALVERT CLIFFS 1	16	11	1	0	4	2	4	0
CALVERT CLIFFS 2	5	6	4	6	0	0	11	0
CATAWBA 1	9	90	0	0	16	0	9	6
CATAWBA 2	34	6	0	7	8	3	9	18
CLINTON 1	NA	0	0	10	2	15	0	69
COOK 1	0	1	1	0	0	6	1	0
COOK 2	48	11	0	0	0	0	0	0
COOPER STATION	0	0	17	0	5	0	12	0
CRYSTAL RIVER 3	7	0	5	0	0	2	0	12
DAVIS-BESSE	14	2	0	0	0	15	6	1
DIABLO CANYON 1	0	7	4	0	4	0	0	0
DIABLO CANYON 2	5	7	3	0	33	0	0	4
DRESDEN 2	15	3	0	0	0	0	9	0
DRESDEN 3	57	0	0	0	0	0	7	4
DUANE ARNOLD	0	19	0	0	3	100	23	5
FARLEY 1	0	11	0	2	0	1	0	0
FARLEY 2	0	67	0	0	0	0	0	13
FERMI 2	NA	NA	2	0	61	8	28	0
FITZPATRICK	11	3	0	0	0	42	0	0
FORT CALHOUN	0	0	0	0	0	0	0	9
FORT ST. VRAIN	71	90	4	42	0	0	100	29
GINNA	0	0	17	4	1	0	1	12
GRAND GULF	6	0	11	0	7	1	0	0
HADDAM NECK	0	0	0	0	0	0	0	0
HATCH 1	3	0	2	44	2	13	0	0
HATCH 2	10	0	6	45	2	1	0	0
HOPE CREEK	7	22	0	5	3	11	0	0
INDIAN POINT 2	0	0	2	2	7	4	1	0
INDIAN POINT 3	0	2	1	7	0	43	0	8
KEWAUNEE	0	0	0	3	4	0	0	0
LASALLE 1	17	4	0	0	7	0	4	0
LASALLE 2	0	0	10	0	3	4	0	0
LIMERICK 1	18	0	0	14	0	0	0	0
LIMERICK 2	NA	NA	NA	NA	NA	NA	NA	NA
MAIHE YANKEE	58	0	1	0	9	34	11	1

**TABLE 9.8 FORCED OUTAGE RATE (%) (CONTINUED)**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
MCGUIRE 1	12	4	2	2	0	0	27	43
MCGUIRE 2	5	2	1	0	3	0	2	1
MILLSTONE 1	6	0	2	0	0	6	0	11
MILLSTONE 2	2	1	0	12	0	2	0	0
MILLSTONE 3	1	0	3	16	0	23	13	15
MONTICELLO	1	0	0	0	0	1	0	5
NINE MILE PT. 1	0	28	100	100	100	100	100	100
NINE MILE PT. 2	NA	NA	NA	19	23	0	0	12
NORTH ANNA 1	88	25	37	0	6	0	10	0
NORTH ANNA 2	0	0	0	0	0	0	0	0
OCONEE 1	0	0	0	0	2	0	11	0
OCONEE 2	1	0	0	3	0	0	2	7
OCONEE 3	0	0	0	24	0	1	4	0
OYSTER CREEK	30	59	0	0	37	100	85	55
PALISADES	23	56	29	5	0	61	34	0
PALO VERDE 1	38	0	69	9	60	0	30	100
PALO VERDE 2	1	0	0	0	0	9	17	0
PALO VERDE 3	NA	NA	0	0	20	0	31	0
PEACH BOTTOM 2	100	0	0	0	0	0	0	6
PEACH BOTTOM 3	100	0	0	0	0	0	0	0
PERRY	NA	26	7	35	14	0	2	0
PILGRIM	0	0	0	0	0	0	29	42
POINT BEACH 1	0	1	0	0	0	0	0	0
POINT BEACH 2	2	0	0	1	0	0	3	2
PRAIRIE ISLAND 1	0	0	0	0	3	0	0	0
PRAIRIE ISLAND 2	0	0	0	0	0	4	0	1
QUAD CITIES 1	0	13	0	14	0	4	0	13
QUAD CITIES 2	39	17	7	0	24	1	3	4
RANCHO SECO	100	100	100	0	0	32	64	9
RIVER BEND	3	54	9	0	6	2	9	77
ROBINSON 2	23	1	47	8	23	14	7	14
SALEM 1	0	0	5	0	8	0	12	71
SALEM 2	22	0	0	8	7	72	23	14
SAN ONOFRE 1	3	0	0	0	0	0	0	87
SAN ONOFRE 2	0	8	0	0	3	0	34	28
SAN ONOFRE 3	0	2	14	0	6	0	3	12
SEABROOK	NA	NA	NA	NA	NA	NA	NA	NA
SEQUOYAH 1	100	100	100	100	100	87	3	0
SEQUOYAH 2	100	100	100	69	0	0	0	16
SHEARON HARRIS	20	1	9	0	0	5	6	0
SHOREHAM	NA	NA	NA	NA	NA	NA	NA	NA
SOUTH TEXAS 1	NA	NA	NA	NA	20	8	13	0
SOUTH TEXAS 2	NA	NA	NA	NA	NA	NA	NA	0
ST. LUCIE 1	0	12	1	1	8	0	0	0
ST. LUCIE 2	3	15	0	0	0	0	0	2
SUMMER	13	2	2	11	3	0	28	19
SURRY 1	6	13	4	0	26	100	100	100
SURRY 2	0	0	5	45	0	0	0	0
SUSQUEHANNA 1	4	30	7	12	0	0	22	0
SUSQUEHANNA 2	0	0	0	4	0	0	7	0

**TABLE 9.8 FORCED OUTAGE RATE (%) (CONTINUED)**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	89-4	89-1	89-2
THREE MILE ISL. 1	1	0	3	0	19	18	0	0
TROJAN	7	22	6	0	10	20	0	0
TURKEY POINT 3	77	94	58	0	0	99	45	0
TURKEY POINT 4	16	57	19	35	3	0	0	7
VERMONT YANKEE	0	4	0	1	11	0	0	0
VOGTLE 1	7	18	26	6	5	9	12	3
VOGTLE 2	NA	NA	NA	NA	NA	NA	NA	4
WASH. NUCLEAR 2	16	0	32	0	7	10	4	0
WATERFORD 3	14	11	5	5	0	2	3	0
WOLF CREEK	12	0	31	0	0	0	2	0
YANKEE-ROWE	2	2	4	2	0	0	1	4
ZION 1	0	0	1	0	7	11	31	0
ZION 2	0	5	0	0	0	11	21	1

NA - The plant is not yet commercial.

**TABLE 9.9 EQUIPMENT FORCED OUTAGES/1000 CRITICAL HOURS**

(The latest quarter data are preliminary)

Plant	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
ARKANSAS 1	0.92	0.64	0.46	0.00	0.00	2.38	1.92	0.57
ARKANSAS 2	1.02	0.46	0.00	0.95	1.13	0.00	0.50	1.29
BEAVER VALLEY 1	0.00	0.00	1.30	1.43	0.00	0.50	0.47	0.00
BEAVER VALLEY 2	NA	1.04	1.12	0.92	0.47	0.00	0.59	1.99
BIG ROCK POINT	0.94	1.04	1.00	4.43	0.48	0.95	0.00	0.00
BRAIDWOOD 1	NA	NA	NA	NA	0.00	0.95	1.21	0.51
BRAIDWOOD 2	NA	NA	NA	NA	NA	1.98	0.00	0.46
BROWNS FERRY 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BROWNS FERRY 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BROWNS FERRY 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BRUNSWICK 1	0.47	0.00	0.00	0.00	0.49	1.04	0.00	0.66
BRUNSWICK 2	0.00	0.00	0.00	2.04	0.00	0.46	0.00	0.52
BYRON 1	0.47	0.00	0.00	0.67	1.33	0.00	0.47	0.00
BYRON 2	1.29	1.29	0.46	1.40	0.92	0.46	0.00	0.49
CALLAWAY	0.00	0.89	0.00	1.59	0.00	0.00	0.00	1.08
CALVERT CLIFFS 1	1.07	0.50	0.00	0.00	0.47	1.06	1.37	0.00
CALVERT CLIFFS 2	0.94	1.43	0.00	0.49	0.00	0.00	0.57	0.00
CATAWBA 1	1.48	8.74	1.05	0.00	1.19	0.00	3.10	0.99
CATAWBA 2	3.30	0.52	5.20	3.20	1.44	1.39	3.28	0.00
CLINTON 1	NA	3.41	2.67	0.71	0.46	1.03	0.00	4.69
COOK 1	0.00	0.48	0.00	0.00	0.00	0.95	0.00	0.00
COOK 2	2.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COOPER STATION	0.00	0.00	0.77	0.00	0.47	0.00	0.52	0.00
CRYSTAL RIVER 3	1.34	0.00	0.52	0.00	0.00	0.00	0.00	0.00
DAVIS-BESSE	0.52	0.46	0.00	0.00	0.00	2.15	0.51	0.46
DIABLO CANYON 1	0.00	0.47	0.00	0.00	0.52	0.00	0.00	0.00
DIABLO CANYON 2	0.00	0.49	0.47	0.00	1.59	0.00	0.00	0.51
DRESDEN 2	1.03	0.00	0.00	0.53	0.00	0.00	0.00	0.00
DRESDEN 3	2.60	0.00	0.00	0.00	0.00	0.00	1.47	1.94
DUANE ARNOLD	0.00	0.55	0.00	0.00	0.48	5.80	1.72	0.95
FARLEY 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FARLEY 2	0.00	2.91	0.00	0.00	0.00	0.00	0.00	0.00
FERMI 2	NA	NA	0.00	0.00	3.02	0.00	0.53	0.00
FITZPATRICK	0.99	0.47	0.00	0.00	0.00	0.00	0.00	0.00
FORT CALHOUN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FORT ST. VRAIN	4.27	2.02	0.93	1.31	0.00	0.00	0.00	1.52
GINNA	0.00	0.00	0.86	0.47	0.46	0.00	0.55	0.00
GRAND GULF	0.47	0.00	1.52	0.00	0.93	0.00	0.00	0.00
HADDAM NECK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HATCH 1	0.92	0.00	0.47	0.00	0.47	1.90	0.00	0.00
HATCH 2	1.50	0.00	0.00	0.00	0.00	0.48	0.00	0.00
HOPE CREEK	1.12	2.49	0.00	1.06	0.46	1.50	0.57	0.00
INDIAN POINT 2	0.00	0.00	0.60	0.51	0.00	0.92	0.55	0.00
INDIAN POINT 3	0.00	0.00	0.93	0.60	0.00	1.57	0.00	4.64
KEWAUNEE	0.45	0.00	0.68	1.04	0.00	0.00	0.00	0.00
LASALLE 1	3.03	0.47	0.00	0.00	0.00	0.00	0.48	0.00
LASALLE 2	0.00	0.00	0.50	0.00	0.46	0.00	0.00	0.00
LIMERICK 1	2.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LIMERICK 2	NA	NA	NA	NA	NA	NA	NA	NA
MAINE YANKEE	0.00	0.00	0.46	0.00	0.96	3.94	1.02	0.00

**TABLE 9.9 EQUIPMENT FORCED OUTAGE (CONTINUED)**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
MCGUIRE 1	1.44	0.86	0.93	0.93	0.00	0.00	0.63	0.80
MCGUIRE 2	0.97	0.92	0.92	0.00	2.52	0.45	0.93	0.46
MILLSTONE 1	0.92	0.00	0.46	0.00	0.00	0.47	0.00	1.12
MILLSTONE 2	0.92	0.46	0.00	0.66	0.00	0.00	0.00	0.00
MILLSTONE 3	0.46	0.00	0.00	1.07	0.00	0.57	0.53	3.40
MONTICELLO	0.46	0.00	0.00	0.00	0.00	0.46	0.00	0.00
NINE MILE PT. 1	0.00	1.85	0.00	0.00	0.00	0.00	0.00	0.00
NINE MILE PT. 2	NA	NA	NA	1.69	1.68	0.00	0.00	0.99
NORTH ANNA 1	3.87	1.19	0.69	0.00	0.46	0.00	0.75	0.00
NORTH ANNA 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OCONEE 1	0.00	0.00	0.00	0.00	0.46	0.00	1.84	0.00
OCONEE 2	0.00	0.00	0.00	0.00	0.51	0.00	0.93	2.62
OCONEE 3	0.00	0.00	0.00	1.80	0.84	0.91	0.96	0.00
OYSTER CREEK	1.26	0.00	0.00	0.00	0.70	0.00	15.75	0.94
PALISADES	3.40	1.89	0.00	0.48	0.00	2.48	0.69	0.00
PALO VERDE 1	0.00	0.00	1.72	1.00	2.05	0.00	0.66	0.00
PALO VERDE 2	0.00	0.00	0.00	0.00	0.00	0.49	0.68	0.00
PALO VERDE 3	NA	NA	0.00	0.00	0.00	0.00	1.81	0.00
PEACH BOTTOM 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.47
PEACH BOTTOM 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERRY	NA	3.70	1.31	1.96	1.02	0.00	0.80	0.00
PILGRIM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
POINT BEACH 1	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00
POINT BEACH 2	0.00	0.00	0.00	0.46	0.00	0.00	0.47	0.00
PRAIRIE ISLAND 1	0.00	0.00	0.00	0.00	0.75	0.45	0.00	0.00
PRAIRIE ISLAND 2	0.00	0.00	0.00	0.00	0.00	0.47	0.00	0.66
QUAD CITIES 1	0.00	9.17	0.46	2.07	0.00	0.46	0.00	2.03
QUAD CITIES 2	0.74	0.54	0.97	0.00	0.59	0.00	0.48	1.41
RANCHO SECO	0.00	0.00	0.00	0.00	0.00	2.59	3.32	0.00
RIVER BEND	0.57	9.30	0.99	0.00	0.48	0.51	1.81	14.42
ROBINSON 2	4.00	0.00	0.84	0.99	1.17	2.29	1.13	0.53
SALEM 1	0.00	0.00	3.53	0.54	0.49	0.00	1.07	8.97
SALEM 2	0.00	0.00	0.46	2.43	2.08	6.57	1.68	2.06
SAN ONOFRE 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.81
SAN ONOFRE 2	0.00	1.92	0.00	0.00	0.46	0.00	0.69	0.63
SAN ONOFRE 3	0.00	0.00	0.52	0.00	0.00	0.00	0.47	1.04
SEABROOK	NA	NA	NA	NA	NA	NA	NA	NA
SEQUOYAH 1	0.00	0.00	0.00	0.00	0.00	5.27	0.00	0.00
SEQUOYAH 2	0.00	0.00	0.00	3.82	0.00	0.00	0.00	0.59
SHEARON HARRIS	2.30	0.00	1.00	0.00	0.00	0.59	1.44	0.00
SHOREHAM	NA	NA	NA	NA	NA	NA	NA	NA
SOUTH TEXAS 1	NA	NA	NA	NA	4.81	0.00	1.77	0.00
SOUTH TEXAS 2	NA	NA	NA	NA	NA	NA	NA	0.00
ST. LUCIE 1	0.00	1.51	0.46	0.46	2.95	0.00	0.00	0.00
ST. LUCIE 2	0.45	3.35	0.00	0.00	0.00	0.00	0.00	0.64
SUMMER	0.51	0.46	0.47	1.02	0.00	0.00	0.00	0.56
SURRY 1	1.02	1.03	0.47	0.00	0.69	0.00	0.00	0.00
SURRY 2	0.00	0.00	0.48	0.81	0.00	0.00	0.00	0.00
SUSQUEHANNA 1	0.59	0.00	0.00	0.51	0.00	0.00	1.16	0.00
SUSQUEHANNA 2	0.00	0.00	0.00	4.09	0.00	0.45	0.50	0.00

**TABLE 9.9 EQUIPMENT FORCED OUTAGE (CONTINUED)**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
THREE MILE ISL. 1	0.46	0.00	0.47	0.00	1.07	1.63	0.00	0.00
TROJAN	0.00	1.15	0.49	0.00	1.11	0.56	0.00	0.00
TURKEY POINT 3	6.26	18.47	3.01	0.00	0.00	92.17	0.81	0.00
TURKEY POINT 4	1.01	0.00	0.56	1.36	0.55	0.00	0.00	1.78
VERMONT YANKEE	0.00	0.00	0.00	0.99	1.00	0.00	0.00	0.00
VOGTLE 1	0.00	0.61	1.23	0.97	0.93	2.03	1.03	0.46
VOGTLE 2	NA	NA	NA	NA	NA	NA	NA	1.12
WASH. NUCLEAR 2	1.81	0.00	1.97	0.00	0.53	0.50	0.49	0.00
WATERFORD 3	1.05	0.51	0.00	1.29	0.00	0.00	0.48	0.00
WOLF CREEK	1.02	0.00	1.90	0.00	0.00	0.00	0.95	0.00
YANKEE-ROWE	0.92	1.36	0.94	0.47	0.00	0.00	0.53	0.94
ZION 1	0.00	0.00	0.77	0.00	0.48	0.00	1.31	0.00
ZION 2	0.00	0.47	0.00	0.00	0.00	2.33	1.15	0.46

NA - The plant is not yet commercial.

**TABLE 9.10 COLLECTIVE RADIATION EXPOSURE**

Data Source: INPO

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
ARKANSAS 1	40	72	185	133	134	242	64	NA
ARKANSAS 2	40	72	185	133	134	242	64	NA
BEAVER VALLEY 1	9	152	483	23	10	13	59	NA
BEAVER VALLEY 2	NA	NA	NA	NA	NA	NA	59	NA
BIG ROCK POINT	9	15	25	106	14	11	16	NA
BRAIDWOOD 1	NA	NA	55	10	5	5	50	NA
BRAIDWOOD 2	NA	NA	NA	NA	NA	NA	NA	NA
BROWNS FERRY 1	81	65	85	110	36	76	42	NA
BROWNS FERRY 2	81	65	85	110	36	76	42	NA
BROWNS FERRY 3	81	65	85	110	36	76	42	NA
BRUNSWICK 1	73	70	448	65	44	316	258	NA
BRUNSWICK 2	73	70	448	65	44	316	258	NA
BYRON 1	11	15	4	87	156	191	66	NA
BYRON 2	NA	NA	NA	NA	NA	NA	66	NA
CALLAWAY	101	154	3	5	6	13	6	NA
CALVERT CLIFFS 1	20	17	19	105	9	12	20	NA
CALVERT CLIFFS 2	20	17	19	105	9	12	20	NA
CATAWBA 1	208	356	141	8	30	98	79	NA
CATAWBA 2	NA	NA	141	8	30	98	79	NA
CLINTON 1	NA	NA	NA	NA	NA	NA	260	NA
COOK 1	203	24	7	109	184	74	95	NA
COOK 2	203	24	7	109	184	74	95	NA
COOPER STATION	19	20	60	149	20	21	28	NA
CRYSTAL RIVER 3	42	414	16	3	5	39	130	NA
DAVIS-BESSE	8	14	26	162	102	17	7	NA
DIABLO CANYON 1	7	7	69	154	64	143	3	NA
DIABLO CANYON 2	7	7	69	154	64	143	3	NA
DRESDEN 2	55	37	56	253	46	343	370	NA
DRESDEN 3	55	37	56	253	46	343	370	NA
DUANE ARNOLD	27	37	22	17	50	526	45	NA
FARLEY 1	18	205	64	192	10	11	35	NA
FARLEY 2	18	205	64	192	10	11	35	NA
FERMI 2	5	10	38	32	18	15	11	NA
FITZPATRICK	63	53	139	87	224	335	58	NA
FORT CALHOUN	22	21	20	17	30	213	48	NA
FORT ST. VRAIN	1	0	0	0	0	0	1	NA
GINNA	16	13	226	12	13	21	124	NA
GRAND GULF	24	315	54	20	36	37	143	NA
HADDAM NECK	529	178	170	39	13	14	17	NA
HATCH 1	49	59	198	73	69	361	57	NA
HATCH 2	49	59	198	73	69	361	57	NA
HOPE CREEK	NA	NA	215	35	18	29	117	NA
INDIAN POINT 2	40	1118	76	44	82	32	220	NA
INDIAN POINT 3	127	18	7	39	4	45	454	NA
KEWAUNEE	3	5	175	26	5	5	208	NA
LASALLE 1	151	58	173	413	90	560	178	NA
LASALLE 2	151	58	173	413	90	560	178	NA
LIMERICK 1	117	22	17	16	12	9	162	NA
LIMERICK 2	NA	NA	NA	NA	NA	NA	NA	NA
MAINE YANKEE	40	16	20	23	18	665	21	NA



**TABLE 9.10 COLLECTIVE RADIATION EXPOSURE (CONTINUED)**

Data Source: INPO

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
MCGUIRE 1	114	115	17	190	63	281	30	NA
MCGUIRE 2	114	115	17	190	63	281	30	NA
MILLSTONE 1	380	32	96	32	6	11	47	NA
MILLSTONE 2	15	15	476	160	28	55	533	NA
MILLSTONE 3	NA	NA	55	19	3	6	8	NA
MONTICELLO 1	31	428	47	24	23	16	21	NA
NINE MILE PT. 1	17	32	283	236	152	133	56	NA
NINE MILE PT. 2	NA	NA	NA	NA	NA	NA	56	NA
NORTH ANNA 1	287	145	31	10	8	10	174	NA
NORTH ANNA 2	287	145	31	10	8	10	174	NA
OCONEE 1	83	82	129	42	100	24	62	NA
OCONEE 2	83	82	129	42	100	24	62	NA
OCONEE 3	83	82	129	42	100	24	62	NA
OYSTER CREEK	105	172	82	82	205	1131	509	NA
PALISADES	37	302	95	29	338	279	17	NA
PALO VERDE 1	91	345	152	148	15	11	23	NA
PALO VERDE 2	NA	NA	152	148	15	11	23	NA
PALO VERDE 3	NA	NA	NA	NA	NA	NA	23	NA
PEACH BOTTOM 2	202	291	360	434	214	151	58	NA
PEACH BOTTOM 3	202	291	360	434	214	151	58	NA
PERRY 1	NA	NA	20	17	25	30	246	NA
PILGRIM	603	281	163	57	96	75	49	NA
POINT BEACH 1	8	164	11	74	11	98	9	NA
POINT BEACH 2	8	164	11	74	11	98	9	NA
PRAIRIE ISLAND 1	5	9	45	5	46	3	6	NA
PRAIRIE ISLAND 2	5	9	45	5	46	3	6	NA
QUAD CITIES 1	53	197	55	286	38	36	39	NA
QUAD CITIES 2	53	197	55	286	38	36	39	NA
RANCHO SECO	75	68	29	12	22	19	27	NA
RIVER BEND	59	280	17	21	20	42	105	NA
ROBINSON 2	36	20	69	22	34	441	117	NA
SALEM 1	20	263	44	15	109	92	9	NA
SALEM 2	20	263	44	15	109	92	9	NA
SAN ONOFRE 1	65	70	84	85	47	62	77	NA
SAN ONOFRE 2	65	70	84	85	47	62	77	NA
SAN ONOFRE 3	65	70	84	85	47	62	77	NA
SEABROOK	NA	NA	NA	NA	NA	NA	NA	NA
SEQUOYAH 1	49	41	NA	124	131	19	302	NA
SEQUOYAH 2	49	41	NA	124	131	19	302	NA
SHEARON HARRIS	NA	NA	NA	NA	NA	NA	6	NA
SHOREHAM	NA	NA	NA	NA	NA	NA	NA	NA
SOUTH TEXAS 1	NA	NA	NA	NA	NA	NA	NA	NA
SOUTH TEXAS 2	NA	NA	NA	NA	NA	NA	NA	NA
ST. LUCIE 1	9	127	16	16	232	18	144	NA
ST. LUCIE 2	9	127	16	16	232	18	144	NA
SUMMER	10	9	8	8	28	464	27	NA
SURRY 1	28	65	37	352	116	287	118	NA
SURRY 2	28	65	37	352	116	287	118	NA
SUSQUEHANNA 1	80	164	97	125	18	17	28	NA
SUSQUEHANNA 2	80	164	97	125	18	17	28	NA

**TABLE 9.10 COLLECTIVE RADIATION EXPOSURE (CONTINUED)**

Data Source: INPO

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
THREE MILE ISL 1	17	12	12	63	116	20	12	NA
TROJAN	18	11	10	346	12	33	7	NA
TURKEY POINT 3	83	48	52	26	30	228	116	NA
TURKEY POINT 4	83	48	52	26	30	228	116	NA
VERMONT YANKEE	228	24	32	24	31	38	194	NA
VOGTLE 1	NA	NA	NA	NA	NA	NA	11	NA
VOGTLE 2	NA	NA	NA	NA	NA	NA	NA	NA
WASH. NUCLEAR 2	42	32	43	201	64	44	36	NA
WATERFORD 3	16	32	10	201	12	36	9	NA
WOLF CREEK	3	117	60	4	3	229	5	NA
YANKEE-ROWE	11	9	9	10	13	195	23	NA
ZION 1	64	10	198	179	12	241	42	NA
ZION 2	64	10	198	179	12	241	42	NA

NA - Data were not available for this quarter.

**TABLE 9.11 CRITICAL HOURS**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
ARKANSAS 1	2177	1561	2152	2183	1402	419	520	1744
ARKANSAS 2	1957	2186	1028	1056	1767	2181	2000	1553
BEAVER VALLEY 1	2208	1727	771	2091	2191	2014	2119	2109
BEAVER VALLEY 2	604	1715	1785	2163	2128	2209	1695	502
BIG ROCK POINT	2117	1922	1997	226	2076	2096	2063	1678
BRAIDWOOD 1	1060	2000	86	1557	1996	2108	1648	1961
BRAIDWOOD 2	NA	NA	192	829	1968	1807	1127	2152
BROWNS FERRY 1	0	0	0	0	0	0	0	0
BROWNS FERRY 2	0	0	0	0	0	0	0	0
BROWNS FERRY 3	0	0	0	0	0	0	0	0
BRUNSWICK 1	2125	2209	1531	2137	2031	962	0	1519
BRUNSWICK 2	2208	2209	24	1467	2001	2154	2160	1939
BYRON 1	2129	2209	2184	1494	1499	1309	2143	2183
BYRON 2	1947	1551	2170	2141	2171	2194	806	2021
CALLAWAY	1724	1126	2078	1883	2187	2055	2138	927
CALVERT CLIFFS 1	1866	1983	2184	194	2139	1881	1455	352
CALVERT CLIFFS 2	2121	2104	1358	2052	2208	2209	1766	0
CATAWBA 1	2030	114	1898	2183	1681	1308	1289	2020
CATAWBA 2	1514	1923	378	1875	2080	2164	1526	505
CLINTON 1	1870	1173	1875	1407	2181	1936	51	426
COOK 1	0	2104	2131	2183	2010	2109	1810	0
COOK 2	1158	1974	2184	532	0	0	395	1863
COOPER STATION	2208	2209	1297	332	2130	2209	1913	512
CRYSTAL RIVER 3	1494	0	1913	2183	2208	1153	1016	279
DAVIS-BESSE	1932	2176	1661	0	0	465	1962	2168
DIABLO CANYON 1	2208	2121	1532	0	1942	2209	2160	2183
DIABLO CANYON 2	1868	2058	2117	2183	1258	632	2160	1946
DRESDEN 2	1933	2183	2184	1882	2208	700	929	2183
DRESDEN 3	1155	2209	2066	133	2208	1939	2040	1548
DUANE ARNOLD	2069	1823	2184	2162	2091	173	1741	2103
FARLEY 1	2208	2007	2041	982	2208	2198	2160	2183
FARLEY 2	2208	344	2184	2183	2208	2209	1995	959
FERMI 2	649	1986	1134	1247	994	1950	1870	2183
FITZPATRICK	2011	2149	1802	2183	1386	690	2160	2183
FORT CALHOUN	2208	2209	2184	2183	2143	0	1479	2022
FORT ST. VRAIN	703	496	2149	1530	119	0	193	1971
GINNA	2208	2209	1166	2111	2193	2209	1806	708
GRAND GULF	2129	891	1970	2183	2154	2191	1829	1025
HADDAM NECK	420	0	258	1502	2208	2209	2160	2183
HATCH 1	2169	2209	2144	1210	2128	527	2160	2183
HATCH 2	2005	2209	616	1471	2178	2095	2160	2183
HOPE CREEK	1789	1609	1045	1891	2159	1994	1758	2183
INDIAN POINT 2	2208	96	1673	1963	1692	2164	1811	0
INDIAN POINT 3	674	2181	2158	1670	2208	1277	817	215
KEWAUNEE	2202	2209	1478	1932	2137	2209	1208	1825
LASALLE 1	330	2135	1730	0	1992	2209	2086	2183
LASALLE 2	2208	2209	1983	2183	2159	323	1246	2183
LIMERICK 1	781	2209	2184	1875	2208	2209	258	1110
LIMERICK 2	NA	NA	NA	NA	NA	NA	NA	NA
MAINE YANKEE	1115	2209	2168	2183	2091	508	1970	2172

**TABLE 9.11 CRITICAL HOURS (CONTINUED)**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	89-4	89-1	89-2
MCGUIRE 1	1390	1160	2146	2141	2208	289	1584	1256
MCGUIRE 2	2052	2170	2166	1349	1590	2209	2149	2165
MILLSTONE 1	1088	2158	2155	2183	2208	2116	2160	890
MILLSTONE 2	2169	2170	1037	1526	2208	2183	826	1560
MILLSTONE 3	2192	731	1359	1869	2208	1760	1900	882
MONTICELLO	2198	857	2184	2183	2208	2194	2160	2074
NINE MILE PT. 1	2208	1620	0	0	0	0	0	0
NINE MILE PT. 2	1093	1113	1448	1279	1782	16	0	2020
NORTH ANNA 1	258	1680	1459	2183	2169	2209	1334	0
NORTH ANNA 2	1297	1413	2135	2183	2208	2209	1205	1297
OCONEE 1	1522	1375	2184	2183	2193	2209	1090	2183
OCONEE 2	2192	2209	797	2003	1980	2209	2144	1147
OCONEE 3	2208	2209	2184	1667	1184	2195	2094	2183
OYSTER CREEK	1584	952	2184	2183	1422	0	64	1069
PALISADES	1762	528	1574	2083	931	403	1445	2183
PALO VERDE 1	1389	47	580	1999	976	2208	1522	0
PALO VERDE 2	2160	2146	1202	311	2208	2029	1475	44
PALO VERDE 3	NA	946	2184	2184	1794	2208	1106	0
PEACH BOTTOM 2	0	0	0	0	0	0	0	1359
PEACH BOTTOM 3	0	0	0	0	0	0	0	0
PERRY	773	1402	1526	1530	1953	1931	1255	0
PILGRIM	0	0	0	0	0	0	969	1259
POINT BEACH 1	2208	2194	2184	1247	2208	2209	2160	1151
POINT BEACH 2	2181	1137	2184	2164	2208	1152	2144	2183
PRAIRIE ISLAND 1	2202	2209	2102	2183	1341	2209	2160	2183
PRAIRIE ISLAND 2	2208	2209	1286	2183	2208	2137	2088	1521
QUAD CITIES 1	1753	218	2184	1934	2208	2152	2160	1967
QUAD CITIES 2	1360	1856	2061	380	1708	2144	2103	2124
RANCHO SECO	0	0	4	1970	2029	1542	903	1452
RIVER BEND	1763	215	2017	2183	2104	1976	1656	208
ROBINSON 2	1750	2209	1189	2016	1714	873	888	1886
SALEM 1	2208	46	849	1839	2040	2209	1862	223
SALEM 2	1547	912	2184	2061	1444	304	1783	1939
SAN ONOFRE 1	2141	2209	1069	0	1354	1395	0	208
SAN ONOFRE 2	1419	522	1826	2092	2160	2209	1449	1584
SAN ONOFRE 3	2208	2190	1936	697	1090	2209	2110	1924
SEABROOK	NA	NA	NA	NA	NA	NA	NA	194
SEQUOYAH 1	0	0	0	0	0	380	2111	2183
SEQUOYAH 2	0	0	0	785	2208	2209	429	1687
SHEARON HARRIS	1739	1495	1994	2183	700	1708	2078	2183
SHOREHAM	0	0	0	0	0	0	0	0
SOUTH TEXAS 1	NA	NA	384	1181	1735	1873	1129	2183
SOUTH TEXAS 2	NA	NA	NA	NA	NA	NA	411	1414
ST. LUCIE 1	2208	1988	2163	2165	1017	2209	2160	2132
ST. LUCIE 2	2208	894	2184	2183	2208	2209	742	1560
SUMMER	1954	2175	2149	1956	1832	131	1588	1779
SURRY 1	1954	1950	2119	194	1443	0	0	0
SURRY 2	2208	1871	2080	1242	1706	0	0	0
SUSQUEHANNA 1	1688	726	1909	1954	2208	2209	1721	539
SUSQUEHANNA 2	2208	2209	1560	245	2143	2209	1987	2183

**TABLE 9.11 CRITICAL HOURS (CONTINUED)**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
THREE MILE ISL. 1	2197	2209	2122	1869	932	1837	2160	2183
TROJAN	845	1736	2057	287	1803	1778	2160	120
TURKEY POINT 3	319	162	995	2183	2208	22	1231	167
TURKEY POINT 4	1980	971	1780	1466	1804	0	0	562
VERMONT YANKEE	910	2122	2184	2017	1994	2209	985	2014
VOGTLE 1	2081	1642	1620	2069	2148	985	1944	2172
VOGTLE 2	NA	NA	NA	NA	NA	NA	83	1793
WASH. NUCLEAR 2	1658	2117	1520	904	1895	1992	2028	770
WATERFORD 3	1898	1950	2084	777	2173	1590	2101	2183
WOLF CREEK	1964	0	1581	2183	2208	146	2115	2183
YANKEE-ROWE	2174	2209	2117	2148	2208	1014	1891	2122
ZION 1	2208	2209	1306	1362	2099	1981	1527	2183
ZION 2	1458	2118	2184	2183	2208	430	1734	2183

NA - The plant is not yet critical.

**TABLE 9.12 CAUSE CODES**

**ADMINISTRATIVE CONTROL PROBLEM**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
ARKANSAS 1	2	3	3	1	1	7	3	NA
ARKANSAS 2	1	2	1	4	2	2	2	NA
BEAVER VALLEY 1	2	1	3	2	0	1	1	NA
BEAVER VALLEY 2	10	3	2	0	1	1	3	NA
BIG ROCK POINT	1	0	1	1	0	0	1	NA
BRAIDWOOD 1	8	3	2	5	3	1	0	NA
BRAIDWOOD 2	NA	0	1	2	3	3	1	NA
BROWNS FERRY 1	6	3	8	3	12	11	9	NA
BROWNS FERRY 2	6	2	7	3	12	12	10	NA
BROWNS FERRY 3	4	3	7	3	12	10	7	NA
BRUNSWICK 1	0	1	4	2	1	4	4	NA
BRUNSWICK 2	0	2	5	1	1	5	1	NA
BYRON 1	1	2	0	1	1	1	2	NA
BYRON 2	3	2	0	3	1	1	2	NA
CALLAWAY	7	2	2	1	1	2	0	NA
CALVERT CLIFFS 1	0	1	0	1	1	2	3	NA
CALVERT CLIFFS 2	1	1	1	0	1	0	5	NA
CATAWBA 1	6	5	7	2	1	2	3	NA
CATAWBA 2	6	6	10	6	2	3	6	NA
CLINTON 1	8	5	2	4	1	4	9	NA
COOK 1	5	3	1	2	4	2	2	NA
COOK 2	3	3	1	2	3	3	2	NA
COOPER STATION	3	0	2	4	0	0	4	NA
CRYSTAL RIVER 3	4	3	5	2	2	7	5	NA
DAVIS-BESSE	3	1	3	4	5	3	2	NA
DIABLO CANYON 1	1	7	3	5	3	2	3	NA
DIABLO CANYON 2	3	1	1	3	1	8	4	NA
DRESDEN 2	3	1	3	5	0	3	7	NA
DRESDEN 3	4	1	3	10	0	1	1	NA
DUANE ARNOLD	5	1	0	2	3	2	3	NA
FARLEY 1	0	2	1	4	0	1	0	NA
FARLEY 2	0	3	2	2	0	0	1	NA
FERMI 2	11	3	5	2	1	1	2	NA
FITZPATRICK	1	1	1	1	0	4	0	NA
FORT CALHOUN	2	1	3	2	3	5	5	NA
FORT ST. VRAIN	NA	NA	NA	NA	NA	NA	NA	NA
GINNA	0	0	1	1	1	1	0	NA
GRAND GULF	1	5	5	0	2	1	0	NA
HADDAM NECK	1	2	0	1	1	0	2	NA
HATCH 1	2	2	2	4	2	3	3	NA
HATCH 2	2	1	6	6	1	1	2	NA
HOPE CREEK	6	2	5	3	3	2	5	NA
INDIAN POINT 2	0	4	0	2	3	0	0	NA
INDIAN POINT 3	0	1	1	1	0	0	4	NA
KEWAUNEE	1	1	1	2	2	0	4	NA
LASALLE 1	3	1	1	0	1	1	3	NA
LASALLE 2	1	2	2	0	1	2	5	NA
LIMERICK 1	7	8	3	3	0	4	9	NA
LIMERICK 2	NA	NA	NA	NA	NA	NA	NA	NA
MAINE YANKEE	0	0	2	0	1	0	1	NA

**TABLE 9.12 CAUSE CODES (CONTINUED)**

**ADMINISTRATIVE CONTROL PROBLEM**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
MCGUIRE 1	8	9	3	3	10	9	4	NA
MCGUIRE 2	9	6	2	6	7	4	4	NA
MILLSTONE 1	4	2	0	0	0	2	2	NA
MILLSTONE 2	0	2	2	0	0	0	0	NA
MILLSTONE 3	1	7	7	3	1	4	3	NA
MONTICELLO	0	5	1	1	0	0	2	NA
NINE MILE PT. 1	1	8	4	4	2	2	4	NA
NINE MILE PT. 2	12	8	8	4	12	7	5	NA
NORTH ANNA 1	4	1	5	3	0	7	1	NA
NORTH ANNA 2	4	2	2	4	0	6	1	NA
OCONEE 1	1	5	5	3	2	1	7	NA
OCONEE 2	3	4	4	3	1	1	2	NA
OCONEE 3	1	5	3	4	3	1	3	NA
OYSTER CREEK	2	2	2	3	3	7	5	NA
PALISADES	5	5	5	2	3	0	2	NA
PALO VERDE 1	2	3	10	2	2	3	2	NA
PALO VERDE 2	1	3	4	4	2	2	1	NA
PALO VERDE 3	1	0	3	1	0	0	0	NA
PEACH BOTTOM 2	2	3	2	3	4	7	3	NA
PEACH BOTTOM 3	0	3	1	1	2	4	1	NA
PERRY	9	2	7	4	4	3	6	NA
PILGRIM	2	3	5	2	3	3	5	NA
POINT BEACH 1	0	0	1	1	1	2	1	NA
POINT BEACH 2	1	0	1	2	0	1	0	NA
PRAIRIE ISLAND 1	1	1	1	0	1	3	1	NA
PRAIRIE ISLAND 2	0	0	1	0	0	1	1	NA
QUAD CITIES 1	1	3	5	1	2	1	1	NA
QUAD CITIES 2	1	4	6	7	3	6	0	NA
RANCHO SECO	5	2	2	4	2	3	1	NA
RIVER BEND	2	7	5	0	3	3	3	NA
ROBINSON 2	2	1	2	3	4	2	2	NA
SALEM 1	1	5	4	1	5	1	4	NA
SALEM 2	0	5	4	1	5	3	4	NA
SAN ONOFRE 1	1	2	7	1	1	1	3	NA
SAN ONOFRE 2	2	5	1	3	5	1	4	NA
SAN ONOFRE 3	2	2	3	2	6	1	4	NA
SEABROOK	1	2	1	1	1	1	1	NA
SEQUOYAH 1	14	9	15	5	6	6	5	NA
SEQUOYAH 2	14	8	20	6	7	1	4	NA
SHEARON HARRIS	6	6	3	4	4	2	3	NA
SHOREHAM	5	1	2	2	3	3	1	NA
SOUTH TEXAS 1	4	7	16	4	3	5	5	NA
SOUTH TEXAS 2	NA	NA	NA	NA	NA	0	4	NA
ST. LUCIE 1	0	2	0	0	1	0	0	NA
ST. LUCIE 2	0	1	2	1	0	0	1	NA
SUMMER	2	3	0	1	2	0	2	NA
SURRY 1	1	2	1	4	6	2	4	NA
SURRY 2	1	0	2	5	3	2	3	NA
SUSQUEHANNA 1	3	3	0	0	3	1	5	NA
SUSQUEHANNA 2	1	0	3	1	2	0	3	NA

**TABLE 9.12 CAUSE CODES (CONTINUED)**

**ADMINISTRATIVE CONTROL PROBLEM**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
THREE MILE ISL 1	1	0	0	1	4	0	0	NA
TROJAN	3	3	4	8	3	4	3	NA
TURKEY POINT 3	6	4	3	2	7	3	3	NA
TURKEY POINT 4	6	4	2	2	4	3	1	NA
VERMONT YANKEE	7	3	2	1	2	2	7	NA
VOGTLE 1	2	10	4	7	3	5	4	NA
VOGTLE 2	NA	NA	NA	NA	NA	NA	3	NA
WASH. NUCLEAR 2	7	2	6	6	5	3	4	NA
WATERFORD 3	4	4	3	11	1	4	3	NA
WOLF CREEK	7	6	0	2	3	0	3	NA
YANKEE-ROWE	1	0	2	1	0	3	2	NA
ZION 1	2	1	3	3	4	2	2	NA
ZION 2	3	1	2	2	2	9	4	NA

NA - The data were not available for this quarter.



**TABLE 9.13 CAUSE CODES**

**LICENSED OPERATOR ERROR**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
ARKANSAS 1	1	0	0	0	0	4	1	NA
ARKANSAS 2	0	0	0	0	0	1	0	NA
BEAVER VALLEY 1	1	0	1	1	2	2	1	NA
BEAVER VALLEY 2	4	1	0	0	1	3	0	NA
BIG ROCK POINT	1	0	2	0	0	0	0	NA
BRAIDWOOD 1	4	2	1	0	1	0	1	NA
BRAIDWOOD 2	NA	0	1	1	0	0	0	NA
BROWNS FERRY 1	0	0	1	1	1	3	3	NA
BROWNS FERRY 2	0	0	1	1	1	3	3	NA
BROWNS FERRY 3	0	0	1	1	1	3	3	NA
BRUNSWICK 1	0	0	0	0	0	3	4	NA
BRUNSWICK 2	0	0	1	1	0	2	1	NA
BYRON 1	1	0	0	0	1	0	0	NA
BYRON 2	2	0	0	2	1	0	1	NA
CALLAWAY	0	2	2	2	1	1	1	NA
CALVERT CLIFFS 1	2	0	0	0	2	0	2	NA
CALVERT CLIFFS 2	1	0	0	1	1	0	1	NA
CATAWBA 1	0	1	3	0	0	0	2	NA
CATAWBA 2	3	1	4	3	0	0	2	NA
CLINTON 1	6	1	1	2	0	1	4	NA
COOK 1	2	0	1	0	0	0	1	NA
COOK 2	1	1	0	0	0	0	2	NA
COOPER STATION	0	0	1	3	0	0	3	NA
CRYSTAL RIVER 3	2	1	0	0	1	1	1	NA
DAVIS-BESSE	0	0	0	1	0	4	1	NA
DIABLO CANYON 1	2	1	0	1	1	1	0	NA
DIABLO CANYON 2	4	0	1	0	0	1	0	NA
DRESDEN 2	0	1	0	1	0	1	2	NA
DRESDEN 3	0	0	0	0	0	0	2	NA
DUANE ARNOLD	1	0	0	0	0	1	0	NA
FARLEY 1	0	0	2	0	0	0	0	NA
FARLEY 2	0	1	2	0	0	0	0	NA
FERMI 2	3	0	6	1	0	2	1	NA
FITZPATRICK	2	1	0	0	0	0	1	NA
FORT CALHOUN	1	1	0	0	0	0	0	NA
FORT ST. VRAIN	NA	NA	NA	NA	NA	NA	NA	NA
GINNA	0	0	1	0	0	0	0	NA
GRAND GULF	0	1	0	0	1	0	0	NA
HADDAM NECK	0	0	1	1	0	0	0	NA
HATCH 1	1	1	0	0	0	0	1	NA
HATCH 2	1	0	0	1	0	0	0	NA
HOPE CREEK	0	0	0	1	0	0	1	NA
INDIAN POINT 2	0	0	1	0	0	0	0	NA
INDIAN POINT 3	1	0	1	0	0	0	0	NA
KEWAUNEE	0	0	1	0	2	0	0	NA
LASALLE 1	0	0	0	0	0	0	2	NA
LASALLE 2	0	0	0	0	1	1	2	NA
LIMERICK 1	2	2	1	1	0	1	0	NA
LIMERICK 2	NA	NA	NA	NA	NA	NA	NA	NA
MAINE YANKEE	0	0	0	0	0	1	0	NA

**TABLE 9.13 CAUSE CODES (CONTINUED)**

**LICENSED OPERATOR ERROR**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
MCGUIRE 1	3	1	1	1	0	3	0	NA
MCGUIRE 2	1	1	1	1	0	0	0	NA
MILLSTONE 1	1	0	0	0	0	0	0	NA
MILLSTONE 2	0	0	0	0	0	0	0	NA
MILLSTONE 3	0	5	2	2	0	0	3	NA
MONTICELLO	1	1	0	0	0	1	0	NA
NINE MILE PT. 1	0	0	0	0	0	0	1	NA
NINE MILE PT. 2	1	8	3	1	3	0	1	NA
NORTH ANNA 1	0	0	3	0	0	0	0	NA
NORTH ANNA 2	1	3	0	0	0	0	1	NA
OCONEE 1	0	2	0	0	0	0	2	NA
OCONEE 2	0	2	0	0	0	0	0	NA
OCONEE 3	0	2	0	0	0	0	0	NA
OYSTER CREEK	3	0	1	0	2	0	0	NA
PALISADES	2	2	0	0	0	1	0	NA
PALO VERDE 1	1	0	1	3	2	0	1	NA
PALO VERDE 2	1	0	4	0	0	0	1	NA
PALO VERDE 3	0	0	0	0	0	0	1	NA
PEACH BOTTOM 2	0	0	1	0	0	0	1	NA
PEACH BOTTOM 3	0	0	0	0	0	0	0	NA
PERRY	3	3	1	3	1	0	1	NA
PILGRIM	0	0	1	0	0	3	1	NA
POINT BEACH 1	0	0	0	0	0	0	1	NA
POINT BEACH 2	1	1	0	1	0	1	0	NA
PRAIRIE ISLAND 1	1	0	0	1	0	1	0	NA
PRAIRIE ISLAND 2	0	0	0	1	1	0	0	NA
QUAD CITIES 1	0	1	0	1	1	0	0	NA
QUAD CITIES 2	0	0	0	0	1	0	0	NA
RANCHO SECO	0	2	1	1	1	1	2	NA
RIVER BEND	0	0	2	0	1	1	1	NA
ROBINSON 2	0	0	0	0	0	0	1	NA
SALEM 1	0	1	0	0	0	0	2	NA
SALEM 2	1	1	0	1	0	1	0	NA
SAN ONOFRE 1	0	0	0	0	0	0	1	NA
SAN ONOFRE 2	0	0	0	0	0	0	2	NA
SAN ONOFRE 3	0	0	1	1	1	0	1	NA
SEABROOK	0	0	0	0	0	0	0	NA
SEQUOYAH 1	0	1	3	0	0	1	1	NA
SEQUOYAH 2	0	1	6	4	0	0	1	NA
SHEARON HARRIS	3	2	0	1	1	1	0	NA
SHOREHAM	0	0	0	0	0	0	1	NA
SOUTH TEXAS 1	1	1	3	1	1	2	0	NA
SOUTH TEXAS 2	NA	NA	NA	NA	NA	0	0	NA
ST. LUCIE 1	0	1	1	0	1	0	0	NA
ST. LUCIE 2	0	0	1	1	0	0	2	NA
SUMMER	1	1	0	2	0	0	0	NA
SURRY 1	0	0	0	0	1	1	1	NA
SURRY 2	0	0	0	1	1	1	0	NA
SUSQUEHANNA 1	1	0	0	0	0	0	2	NA
SUSQUEHANNA 2	0	0	0	0	0	0	0	NA

**TABLE 9.13 CAUSE CODES (CONTINUED)**

**LICENSED OPERATOR ERROR**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
THREE MILE ISL 1	1	0	0	0	2	0	0	NA
TROJAN	2	0	0	0	0	1	0	NA
TURKEY POINT 3	3	1	2	0	2	0	0	NA
TURKEY POINT 4	3	0	1	0	4	0	0	NA
VERMONT YANKEE	0	0	0	0	0	0	1	NA
VOGTLE 1	0	3	2	0	0	1	1	NA
VOGTLE 2	NA	NA	NA	NA	NA	NA	4	NA
WASH. NUCLEAR 2	0	0	1	4	1	0	0	NA
WATERFORD 3	0	0	0	1	1	0	0	NA
WOLF CREEK	3	2	0	1	0	1	3	NA
YANKEE-ROWE	0	0	0	0	0	0	0	NA
ZION 1	0	0	1	0	1	0	1	NA
ZION 2	3	0	2	1	0	3	2	NA

NA - The data were not available for this quarter.

**TABLE 9.14 CAUSE CODES**

**OTHER PERSONNEL ERROR**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
ARKANSAS 1	1	1	1	0	3	4	1	NA
ARKANSAS 2	1	1	4	2	1	1	1	NA
BEAVER VALLEY 1	0	1	0	2	1	0	0	NA
BEAVER VALLEY 2	7	2	2	0	1	0	1	NA
BIG ROCK POINT	1	0	0	0	0	2	0	NA
BRAIDWOOD 1	6	1	2	1	0	1	0	NA
BRAIDWOOD 2	NA	1	5	1	2	1	0	NA
BROWNS FERRY 1	9	0	3	2	3	6	2	NA
BROWNS FERRY 2	11	0	3	3	3	10	3	NA
BROWNS FERRY 3	7	1	2	3	4	6	3	NA
BRUNSWICK 1	3	0	1	1	2	3	1	NA
BRUNSWICK 2	1	2	3	0	0	4	2	NA
BYRON 1	1	1	0	0	0	0	1	NA
BYRON 2	3	3	2	1	1	1	0	NA
CALLAWAY	2	1	2	0	1	1	1	NA
CALVERT CLIFFS 1	2	0	0	4	2	1	1	NA
CALVERT CLIFFS 2	0	2	0	1	1	0	2	NA
CATAWBA 1	1	3	5	1	1	1	4	NA
CATAWBA 2	4	5	7	4	2	1	3	NA
CLINTON 1	8	5	2	3	3	3	3	NA
COOK 1	1	0	0	0	3	1	1	NA
COOK 2	0	4	0	0	1	1	3	NA
COOPER STATION	1	0	2	2	1	0	4	NA
CRYSTAL RIVER 3	2	6	3	0	2	5	0	NA
DAVIS-BESSE	1	2	1	4	1	2	0	NA
DIABLO CANYON 1	2	3	4	2	4	3	2	NA
DIABLO CANYON 2	1	3	0	2	1	5	0	NA
DRESDEN 2	0	3	1	3	1	1	3	NA
DRESDEN 3	2	1	0	3	1	0	1	NA
DUANE ARNOLD	1	1	0	1	0	2	2	NA
FARLEY 1	0	1	2	1	0	3	0	NA
FARLEY 2	0	3	1	0	0	2	0	NA
FERMI 2	1	2	4	1	6	1	2	NA
FITZPATRICK	1	2	1	0	1	0	0	NA
FORT CALHOUN	1	4	4	3	2	7	2	NA
FORT ST. VRAIN	NA	NA	NA	NA	NA	NA	NA	NA
GINNA	0	1	2	0	1	0	0	NA
GRAND GULF	1	2	4	0	2	1	1	NA
HADDAM NECK	2	2	4	2	1	0	0	NA
HATCH 1	0	0	0	2	0	3	1	NA
HATCH 2	3	2	4	1	1	1	1	NA
HOPE CREEK	4	2	1	3	2	6	0	NA
INDIAN POINT 2	0	3	0	3	1	3	3	NA
INDIAN POINT 3	1	1	1	0	1	1	4	NA
KEWAUNEE	1	0	0	1	2	0	1	NA
LASALLE 1	0	0	0	3	0	2	2	NA
LASALLE 2	0	1	1	4	0	0	4	NA
LIMERICK 1	8	6	2	3	1	5	5	NA
LIMERICK 2	NA	NA	NA	NA	NA	NA	NA	NA
MAINE YANKEE	0	0	0	0	1	1	0	NA

**TABLE 9.14 CAUSE CODES (CONTINUED)**

**OTHER PERSONNEL ERROR**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
MCGUIRE 1	6	5	2	2	4	6	1	NA
MCGUIRE 2	4	4	1	3	3	2	1	NA
MILLSTONE 1	7	1	2	0	0	1	0	NA
MILLSTONE 2	0	1	5	0	1	1	1	NA
MILLSTONE 3	2	5	5	0	2	2	0	NA
MONTICELLO	0	2	3	0	0	0	1	NA
NINE MILE PT. 1	1	4	3	0	0	1	0	NA
NINE MILE PT. 2	5	8	2	2	5	5	3	NA
NORTH ANNA 1	0	0	3	0	0	0	4	NA
NORTH ANNA 2	0	2	1	2	1	1	1	NA
OCONEE 1	0	1	1	1	2	0	3	NA
OCONEE 2	0	0	0	1	0	0	1	NA
OCONEE 3	0	1	0	2	1	0	1	NA
OYSTER CREEK	1	3	0	2	1	2	1	NA
PALISADES	5	1	1	1	4	3	1	NA
PALO VERDE 1	1	2	2	1	1	1	0	NA
PALO VERDE 2	1	2	2	3	1	2	1	NA
PALO VERDE 3	0	0	2	0	3	0	0	NA
PEACH BOTTOM 2	4	5	1	4	2	3	1	NA
PEACH BOTTOM 3	2	4	1	3	3	2	1	NA
PERRY	5	0	3	4	3	2	3	NA
PILGRIM	1	4	2	3	0	0	5	NA
POINT BEACH 1	0	0	0	0	1	0	1	NA
POINT BEACH 2	1	1	0	0	0	0	1	NA
PRAIRIE ISLAND 1	1	2	0	1	1	2	0	NA
PRAIRIE ISLAND 2	1	0	0	0	1	2	0	NA
QUAD CITIES 1	1	5	0	1	2	0	0	NA
QUAD CITIES 2	1	6	0	2	2	4	0	NA
RANCHO SECO	1	1	3	0	4	2	2	NA
RIVER BEND	1	3	0	2	2	1	5	NA
ROBINSON 2	1	1	0	0	1	0	2	NA
SALEM 1	0	2	4	0	1	0	5	NA
SALEM 2	1	0	1	3	0	1	2	NA
SAN ONOFRE 1	0	2	1	1	1	2	1	NA
SAN ONOFRE 2	5	2	2	2	3	2	1	NA
SAN ONOFRE 3	2	0	3	1	5	0	2	NA
SEASBROOK	0	0	1	0	1	1	1	NA
SEQUOYAH 1	7	1	5	3	4	6	7	NA
SEQUOYAH 2	5	1	5	3	5	2	3	NA
SHEARSON HARRIS	3	5	1	4	6	6	6	NA
SHOREHAM	5	2	2	5	2	2	0	NA
SOUTH TEXAS 1	3	3	4	4	3	2	2	NA
SOUTH TEXAS 2	NA	NA	NA	NA	NA	0	0	NA
ST. LUCIE 1	0	2	0	0	3	0	0	NA
ST. LUCIE 2	1	1	0	1	0	0	1	NA
SUMMER	2	2	1	0	1	2	2	NA
SURRY 1	1	1	3	6	2	4	3	NA
SURRY 2	0	2	2	2	1	3	2	NA
SUSQUEHANNA 1	2	4	2	1	1	3	2	NA
SUSQUEHANNA 2	1	1	2	2	0	4	1	NA

**TABLE 9.14 CAUSE CODES (CONTINUED)**

**OTHER PERSONNEL ERROR**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
THREE MILE ISL 1	1	0	0	1	0	0	0	NA
TROJAN	2	2	2	5	7	4	2	NA
TURKEY POINT 3	4	2	2	4	2	2	2	NA
TURKEY POINT 4	4	2	1	5	0	1	0	NA
VERMONT YANKEE	2	2	0	2	1	1	2	NA
VOGTLE 1	11	1	3	0	3	7	6	NA
VOGTLE 2	NA	NA	NA	NA	NA	NA	4	NA
WASH. NUCLEAR 2	1	2	3	3	5	2	2	NA
WATERFORD 3	2	1	2	9	1	3	1	NA
WOLF CREEK	4	3	2	0	0	4	2	NA
YANKEE-ROWE	2	0	0	1	0	0	3	NA
ZION 1	1	1	2	0	2	1	1	NA
ZION 2	2	0	2	0	1	4	3	NA

NA - The data were not available for this quarter.

**TABLE 9.15 CAUSE CODES**

**MAINTENANCE RELATED**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
ARKANSAS 1	3	1	3	1	4	7	3	NA
ARKANSAS 2	2	1	2	5	3	5	3	NA
BEAVER VALLEY 1	3	5	5	3	3	2	3	NA
BEAVER VALLEY 2	17	10	4	1	3	3	7	NA
BIG ROCK POINT	1	0	1	2	1	2	1	NA
BRAIDWOOD 1	20	6	7	6	6	3	3	NA
BRAIDWOOD 2	NA	1	6	8	9	4	2	NA
BROWNS FERRY 1	15	2	11	5	12	20	10	NA
BROWNS FERRY 2	12	2	9	7	12	22	11	NA
BROWNS FERRY 3	9	5	9	6	13	19	9	NA
BRUNSWICK 1	3	2	6	2	3	10	3	NA
BRUNSWICK 2	3	3	11	1	3	9	4	NA
BYRON 1	4	3	1	1	5	2	3	NA
BYRON 2	8	3	3	4	6	2	1	NA
CALLAWAY	7	3	2	3	3	2	2	NA
CALVERT CLIFFS 1	2	2	0	4	1	3	4	NA
CALVERT CLIFFS 2	1	2	3	1	1	0	5	NA
CATAWBA 1	6	6	9	1	1	4	8	NA
CATAWBA 2	7	6	15	12	3	7	9	NA
CLINTON 1	22	8	8	7	5	7	10	NA
COOK 1	8	3	4	2	5	4	5	NA
COOK 2	6	7	2	3	3	3	8	NA
COOPER STATION	4	0	3	9	7	1	5	NA
CRYSTAL RIVER 3	10	7	9	2	2	7	4	NA
DAVIS-BESSE	3	3	4	4	4	4	2	NA
DIABLO CANYON 1	4	13	9	7	6	3	3	NA
DIABLO CANYON 2	6	5	4	6	3	10	3	NA
DRESDEN 2	7	5	4	7	3	7	11	NA
DRESDEN 3	8	1	4	12	1	2	2	NA
DUANE ARNOLD	5	3	1	3	3	1	6	NA
FARLEY 1	1	3	4	4	0	6	0	NA
FARLEY 2	0	7	2	2	0	3	1	NA
FERMI 2	9	5	11	8	10	3	7	NA
FITZPATRICK	7	5	2	3	2	3	2	NA
FORT CALHOUN	3	5	5	6	5	8	7	NA
FORT ST. VRAIN	NA	NA	NA	NA	NA	NA	NA	NA
GINNA	0	0	3	1	4	0	0	NA
GRAND GULF	1	9	8	0	2	2	1	NA
HADDAM NECK	3	3	4	4	3	2	0	NA
HATCH 1	4	2	3	4	2	5	4	NA
HATCH 2	8	4	9	10	4	2	3	NA
HOPE CREEK	12	3	5	6	6	11	5	NA
INDIAN POINT 2	0	9	1	4	6	3	2	NA
INDIAN POINT 3	2	2	2	2	1	1	6	NA
KEWAUNEE	2	0	2	3	3	0	5	NA
LASALLE 1	4	6	4	7	5	5	13	NA
LASALLE 2	3	5	4	9	6	7	12	NA
LIMERICK 1	16	14	5	9	0	6	8	NA
LIMERICK 2	NA	NA	NA	NA	NA	NA	NA	NA
MAINE YANKEE	1	0	2	0	2	1	1	NA

**TABLE 9.15 CAUSE CODES (CONTINUED)**

**MAINTENANCE RELATED**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
MCGUIRE 1	8	13	5	7	11	15	4	NA
MCGUIRE 2	10	8	2	7	9	6	6	NA
MILLSTONE 1	14	3	2	0	2	4	1	NA
MILLSTONE 2	2	3	5	2	1	1	2	NA
MILLSTONE 3	3	16	9	5	3	5	2	NA
MONTICELLO	1	6	2	1	0	0	4	NA
NINE MILE PT. 1	3	10	6	4	1	2	4	NA
NINE MILE PT. 2	14	15	12	5	16	11	6	NA
NORTH ANNA 1	4	3	14	1	1	5	5	NA
NORTH ANNA 2	6	6	5	3	1	5	2	NA
OCONEE 1	1	5	5	0	3	1	6	NA
OCONEE 2	2	3	4	0	2	1	3	NA
OCONEE 3	1	4	3	2	3	2	3	NA
OYSTER CREEK	6	6	2	3	9	7	5	NA
PALISADES	10	4	5	2	7	5	2	NA
PALO VERDE 1	4	4	9	3	3	4	2	NA
PALO VERDE 2	2	5	9	4	1	3	1	NA
PALO VERDE 3	0	2	5	1	3	0	2	NA
PEACH BOTTOM 2	6	8	5	7	4	8	4	NA
PEACH BOTTOM 3	3	6	1	6	6	4	2	NA
PERRY	18	5	10	11	9	5	9	NA
PILGRIM	4	7	7	5	3	4	9	NA
POINT BEACH 1	0	1	1	1	1	1	1	NA
POINT BEACH 2	2	3	1	2	0	0	2	NA
PRAIRIE ISLAND 1	3	2	0	2	2	6	0	NA
PRAIRIE ISLAND 2	2	0	0	1	2	5	0	NA
QUAD CITIES 1	6	9	5	2	3	2	2	NA
QUAD CITIES 2	4	11	9	11	3	6	0	NA
RANCHO SECO	5	4	4	2	2	6	3	NA
RIVER BEND	4	9	7	2	8	5	13	NA
ROBINSON 2	5	3	3	5	3	2	4	NA
SALEM 1	1	5	5	1	5	2	9	NA
SALEM 2	1	6	5	7	5	5	5	NA
SAN ONOFRE 1	2	4	6	2	2	3	3	NA
SAN ONOFRE 2	7	10	6	8	7	2	5	NA
SAN ONOFRE 3	5	1	8	3	9	2	5	NA
SEABROOK	2	2	2	1	1	2	5	NA
SEQUOYAH 1	14	9	16	7	9	12	6	NA
SEQUOYAH 2	14	9	22	10	12	3	4	NA
SHEARON HARRIS	13	9	5	7	9	6	6	NA
SHOREHAM	6	3	3	6	5	3	4	NA
SOUTH TEXAS 1	8	11	20	8	7	5	7	NA
SOUTH TEXAS 2	NA	NA	NA	NA	NA	0	6	NA
ST. LUCIE 1	0	2	3	1	4	0	0	NA
ST. LUCIE 2	1	1	2	1	0	0	1	NA
SUMMER	7	3	2	2	1	3	3	NA
SURRY 1	7	13	7	11	10	8	5	NA
SURRY 2	5	5	8	8	4	7	4	NA
SUSQUEHANNA 1	2	7	5	4	7	2	3	NA
SUSQUEHANNA 2	1	2	8	3	6	3	2	NA



**TABLE 9.15 CAUSE CODES (CONTINUED)**

**MAINTENANCE RELATED**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
THREE MILE ISL 1	2	0	0	1	2	1	0	NA
TROJAN	6	8	5	9	12	10	4	NA
TURKEY POINT 3	7	8	5	7	9	3	5	NA
TURKEY POINT 4	9	6	3	9	11	2	3	NA
VERMONT YANKEE	10	5	3	4	1	3	11	NA
VOGTLE 1	11	11	8	8	7	11	9	NA
VOGTLE 2	NA	NA	NA	NA	NA	NA	8	NA
WASH. NUCLEAR 2	6	3	4	12	7	4	3	NA
WATERFORD 3	6	4	3	15	3	3	1	NA
WOLF CREEK	11	8	2	2	3	3	7	NA
YANKEE-ROWE	2	2	3	2	0	4	4	NA
ZION 1	2	2	6	4	5	4	4	NA
ZION 2	7	2	4	1	4	12	4	NA

NA - The data were not available for this quarter.

**TABLE 9.16 CAUSE CODES - MAINTENANCE SUB-CATEGORIES**

**MAINTENANCE PERSONNEL ERROR**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
ARKANSAS 1	1	0	1	1	2	4	1	NA
ARKANSAS 2	2	1	1	3	1	0	1	NA
BEAVER VALLEY 1	0	3	2	1	0	0	0	NA
BEAVER VALLEY 2	4	3	2	0	0	0	0	NA
BIG ROCK POINT	0	0	0	1	0	2	0	NA
BRAIDWOOD 1	5	1	0	2	1	1	0	NA
BRAIDWOOD 2	NA	1	3	0	3	1	0	NA
BROWNS FERRY 1	2	0	3	3	5	5	6	NA
BROWNS FERRY 2	2	0	3	4	5	6	6	NA
BROWNS FERRY 3	1	1	3	4	6	5	6	NA
BRUNSWICK 1	1	1	2	2	2	2	3	NA
BRUNSWICK 2	0	2	4	0	0	1	1	NA
BYRON 1	0	0	0	0	0	1	1	NA
BYRON 2	0	1	0	0	0	2	0	NA
CALLAWAY	1	0	1	1	1	1	0	NA
CALVERT CLIFFS 1	2	0	0	4	1	2	2	NA
CALVERT CLIFFS 2	0	2	2	0	0	0	3	NA
CATAWBA 1	1	2	4	0	1	1	4	NA
CATAWBA 2	4	4	4	5	2	2	2	NA
CLINTON 1	2	3	1	2	3	3	1	NA
COOK 1	1	0	0	0	2	1	0	NA
COOK 2	0	2	0	0	1	1	2	NA
COOPER STATION	0	0	2	2	0	0	3	NA
CRYSTAL RIVER 3	0	4	3	0	0	3	1	NA
DAVIS-BESSE	1	1	2	3	2	1	0	NA
DIABLO CANYON 1	1	5	2	1	2	2	2	NA
DIABLO CANYON 2	2	3	1	1	1	6	2	NA
DRESDEN 2	0	0	1	4	0	4	4	NA
DRESDEN 3	3	0	1	7	0	1	1	NA
DUANE ARNOLD	3	2	0	3	1	0	2	NA
FARLEY 1	0	3	2	0	0	3	0	NA
FARLEY 2	0	4	1	0	0	1	0	NA
FERMI 2	3	1	6	1	3	0	2	NA
FITZPATRICK	1	1	1	0	1	2	0	NA
FORT CALHOUN	1	1	2	2	1	3	0	NA
FORT ST. VRAIN	NA	NA	NA	NA	NA	NA	NA	NA
GINNA	0	0	1	0	1	0	0	NA
GRAND GULF	0	1	2	0	0	0	1	NA
HADDAM NECK	1	2	3	1	0	0	0	NA
HATCH 1	1	0	0	1	1	2	0	NA
HATCH 2	3	1	2	1	2	1	0	NA
HOPE CREEK	5	1	2	4	0	4	1	NA
INDIAN POINT 2	0	2	0	2	1	3	2	NA
INDIAN POINT 3	1	1	2	0	1	1	2	NA
KEWAUNEE	1	0	0	1	0	0	1	NA
LASALLE 1	0	1	0	4	1	1	0	NA
LASALLE 2	0	2	0	4	1	0	0	NA
LIMERICK 1	5	3	2	3	0	3	3	NA
LIMERICK 2	NA	NA	NA	NA	NA	NA	NA	NA
MAINE YANKEE	0	0	1	0	0	1	0	NA

**TABLE 9.16 CAUSE CODES - MAINTENANCE SUB-CATEGORIES (CONTINUED)**

**MAINTENANCE PERSONNEL ERROR**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
MCGUIRE 1	4	6	3	2	3	8	1	NA
MCGUIRE 2	3	4	2	6	3	2	1	NA
MILLSTONE 1	3	0	0	0	0	1	0	NA
MILLSTONE 2	0	1	4	0	0	1	0	NA
MILLSTONE 3	1	4	5	0	0	0	0	NA
MONTICELLO	0	1	0	0	0	0	2	NA
NINE MILE PT. 1	1	1	3	0	0	0	0	NA
NINE MILE PT. 2	0	4	3	0	3	2	1	NA
NORTH ANNA 1	1	0	1	0	0	2	3	NA
NORTH ANNA 2	0	1	0	1	0	2	1	NA
OCONEE 1	1	1	0	0	2	1	2	NA
OCONEE 2	2	1	1	0	1	1	1	NA
OCONEE 3	1	2	0	1	1	1	1	NA
OYSTER CREEK	1	0	1	1	2	4	3	NA
PALISADES	5	2	0	0	4	1	1	NA
PALO VERDE 1	1	1	4	1	2	0	1	NA
PALO VERDE 2	0	2	2	0	0	0	1	NA
PALO VERDE 3	0	0	2	0	2	0	0	NA
PEACH BOTTOM 2	4	3	2	2	2	2	2	NA
PEACH BOTTOM 3	2	2	1	1	3	2	0	NA
PERRY	3	0	3	0	2	2	5	NA
PILGRIM	2	3	2	4	2	0	2	NA
POINT BEACH 1	0	0	0	0	1	1	1	NA
POINT BEACH 2	1	1	0	1	0	0	1	NA
PRAIRIE ISLAND 1	0	1	0	1	1	0	0	NA
PRAIRIE ISLAND 2	0	0	0	0	1	0	0	NA
QUAD CITIES 1	0	4	2	2	2	0	0	NA
QUAD CITIES 2	0	4	4	5	2	2	0	NA
RANCHO SECO	1	0	0	1	1	2	1	NA
RIVER BEND	1	0	0	0	3	0	3	NA
ROBINSON 2	0	1	1	0	3	1	1	NA
SALEM 1	1	2	0	0	0	0	5	NA
SALEM 2	1	2	1	1	0	1	2	NA
SAN ONOFRE 1	1	2	1	0	0	2	0	NA
SAN ONOFRE 2	4	4	1	2	1	0	2	NA
SAN ONOFRE 3	1	0	1	2	2	0	4	NA
SEABROOK	0	1	1	0	0	1	0	NA
SEQUOYAH 1	5	0	5	6	2	5	3	NA
SEQUOYAH 2	5	0	8	5	2	1	1	NA
SHEARON HARRIS	4	0	0	1	1	5	3	NA
SHOREHAM	1	0	1	1	0	0	1	NA
SOUTH TEXAS 1	3	4	1	2	2	3	2	NA
SOUTH TEXAS 2	NA	NA	NA	NA	NA	0	1	NA
ST. LUCIE 1	0	1	1	0	2	0	0	NA
ST. LUCIE 2	0	1	0	0	0	0	1	NA
SUMMER	1	1	0	0	1	0	1	NA
SURRY 1	1	0	1	5	1	4	3	NA
SURRY 2	0	1	1	2	0	4	4	NA
SUSQUEHANNA 1	2	0	1	0	1	0	2	NA
SUSQUEHANNA 2	1	0	4	1	0	1	1	NA

**TABLE 9.16 CAUSE CODES - MAINTENANCE SUB-CATEGORIES (CONTINUED)****MAINTENANCE PERSONNEL ERROR**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
THREE MILE ISL 1	0	0	0	0	0	0	0	NA
TROJAN	0	0	2	2	4	1	1	NA
TURKEY POINT 3	4	3	2	1	3	1	0	NA
TURKEY POINT 4	4	3	1	1	1	1	0	NA
VERMONT YANKEE	2	2	0	1	0	0	3	NA
VOGTLE 1	3	2	1	1	2	3	2	NA
VOGTLE 2	NA	NA	NA	NA	NA	NA	3	NA
WASH. NUCLEAR 2	1	0	2	5	4	1	3	NA
WATERFORD 3	0	1	2	4	0	1	0	NA
WOLF CREEK	3	2	2	0	1	2	1	NA
YANKEE-ROWE	1	0	0	0	0	0	3	NA
ZION 1	1	1	2	0	1	1	1	NA
ZION 2	2	0	3	0	1	3	4	NA

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NA - The data were not available for this quarter.

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**TABLE 9.17 CAUSE CODES - MAINTENANCE SUB-CATEGORIES**

**PERSONNEL ERROR DURING TEST/CALIB.** (The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
ARKANSAS 1	0	1	2	0	1	3	1	NA
ARKANSAS 2	0	0	1	2	2	3	1	NA
BEAVER VALLEY 1	3	0	1	2	1	2	1	NA
BEAVER VALLEY 2	12	2	1	0	1	3	3	NA
BIG ROCK POINT	0	0	0	0	0	0	1	NA
BRADWOOD 1	11	2	4	3	3	0	0	NA
BRADWOOD 2	NA	0	2	2	2	2	1	NA
BROWNS FERRY 1	9	0	6	1	5	11	4	NA
BROWNS FERRY 2	9	0	5	1	5	13	5	NA
BROWNS FERRY 3	7	1	5	1	5	11	2	NA
BRUNSWICK 1	1	0	2	0	0	4	1	NA
BRUNSWICK 2	1	0	2	1	1	6	2	NA
BYRON 1	0	2	0	0	1	0	1	NA
BYRON 2	4	2	2	1	2	0	1	NA
CALLAWAY	4	2	1	1	2	1	1	NA
CALVERT CLIFFS 1	0	1	0	0	0	1	3	NA
CALVERT CLIFFS 2	1	0	0	1	1	0	3	NA
CATAWBA 1	4	1	5	1	1	1	1	NA
CATAWBA 2	2	2	4	3	1	2	4	NA
CLINTON 1	17	4	4	4	1	3	8	NA
COOK 1	5	2	2	2	3	1	2	NA
COOK 2	3	4	1	2	2	2	2	NA
COOPER STATION	3	0	1	3	1	0	2	NA
CRYSTAL RIVER 3	6	3	3	1	2	4	3	NA
DAVIS-BESSE	2	1	1	1	3	2	1	NA
DIABLO CANYON 1	3	5	3	4	4	1	1	NA
DIABLO CANYON 2	2	1	1	3	1	4	1	NA
DRESDEN 2	2	4	3	2	2	1	3	NA
DRESDEN 3	2	1	2	4	1	0	1	NA
DUANE ARNOLD	1	0	0	2	1	1	3	NA
FARLEY 1	0	0	0	1	0	1	0	NA
FARLEY 2	0	2	1	1	0	0	1	NA
FERMI 2	4	3	5	3	3	2	3	NA
FITZPATRICK	2	3	1	1	0	2	1	NA
FORT CALHOUN	2	4	4	2	1	3	7	NA
FORT ST. VRAIN	NA	NA	NA	NA	NA	NA	NA	NA
GINNA	0	0	1	0	0	0	0	NA
GRAND GULF	0	6	3	0	1	1	0	NA
HADDAM NECK	1	0	2	2	1	0	0	NA
HATCH 1	1	1	2	1	1	2	4	NA
HATCH 2	3	2	8	6	1	0	3	NA
HOPE CREEK	4	1	3	1	5	5	3	NA
INDIAN POINT 2	0	4	0	2	2	0	0	NA
INDIAN POINT 3	1	0	0	1	0	0	3	NA
KEWAUNEE	1	0	1	1	2	0	4	NA
LASALLE 1	2	0	0	0	0	1	4	NA
LASALLE 2	0	0	2	1	0	3	6	NA
LIMERICK 1	9	2	2	3	0	2	4	NA
LIMERICK 2	NA	NA	NA	NA	NA	NA	NA	NA
MATHE YANKEE	0	0	0	0	1	0	0	NA

**TABLE 9.17 CAUSE CODES - MAINTENANCE SUB-CATEGORIES (CONTINUED)**

**PERSONNEL ERROR DURING TEST/CALIB.** (The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
MCGUIRE 1	5	4	1	2	5	4	3	NA
MCGUIRE 2	6	4	0	1	4	2	3	NA
MILLSTONE 1	6	3	1	0	0	1	1	NA
MILLSTONE 2	0	0	2	0	1	0	1	NA
MILLSTONE 3	2	9	3	3	2	3	2	NA
MONTICELLO	1	5	2	1	0	0	1	NA
NINE MILE PT. 1	1	4	2	2	1	2	4	NA
NINE MILE PT. 2	12	8	7	3	7	7	5	NA
NORTH ANNA 1	2	1	5	1	0	3	1	NA
NORTH ANNA 2	3	5	2	2	1	3	0	NA
OCONEE 1	0	2	4	0	1	0	3	NA
OCONEE 2	0	2	2	0	0	0	1	NA
OCONEE 3	0	3	2	1	2	0	1	NA
OYSTER CREEK	2	4	0	1	4	2	2	NA
PALISADES	2	2	3	2	2	1	1	NA
PALO VERDE 1	2	3	5	0	1	2	1	NA
PALO VERDE 2	1	1	6	4	1	2	1	NA
PALO VERDE 3	0	0	3	1	1	0	1	NA
PEACH BOTTOM 2	0	2	1	5	1	5	2	NA
PEACH BOTTOM 3	0	3	0	3	1	2	2	NA
PERRY	12	2	5	3	3	1	4	NA
PILGRIM	1	3	4	0	1	1	5	NA
POINT BEACH 1	0	0	1	1	0	0	0	NA
POINT BEACH 2	1	0	1	1	0	0	0	NA
PRAIRIE ISLAND 1	2	1	0	0	1	3	0	NA
PRAIRIE ISLAND 2	1	0	0	0	1	2	0	NA
QUAD CITIES 1	1	0	3	0	1	1	1	NA
QUAD CITIES 2	1	1	2	2	1	5	0	NA
RANCHO SECO	3	4	4	1	1	2	0	NA
RIVER BEND	2	6	4	1	1	2	5	NA
ROBINSON 2	3	0	1	2	0	0	2	NA
SALEM 1	0	3	4	1	3	0	4	NA
SALEM 2	0	4	3	2	4	2	2	NA
SAN ONOFRE 1	1	0	4	2	1	1	1	NA
SAN ONOFRE 2	2	4	0	3	4	0	3	NA
SAN ONOFRE 3	2	1	2	0	7	1	1	NA
SEABROOK	1	1	1	1	1	0	2	NA
SEQUOYAH 1	9	7	11	1	5	4	3	NA
SEQUOYAH 2	9	6	13	4	7	1	2	NA
SHEARON HARRIS	3	8	3	3	6	3	3	NA
SHOREHAM	4	3	2	5	3	2	1	NA
SOUTH TEXAS 1	3	5	13	5	5	2	4	NA
SOUTH TEXAS 2	NA	NA	NA	NA	NA	0	3	NA
ST. LUCIE 1	0	1	0	0	2	0	0	NA
ST. LUCIE 2	1	0	0	1	0	0	1	NA
SUMMER	3	2	2	2	1	2	2	NA
SURRY 1	1	3	2	3	2	2	3	NA
SURRY 2	1	1	1	1	1	1	1	NA
SUSQUEHANNA 1	0	4	1	2	2	2	0	NA
SUSQUEHANNA 2	0	0	0	2	2	2	0	NA

**TABLE 9.17 CAUSE CODES - MAINTENANCE SUB-CATEGORIES (CONTINUED)**

**PERSONNEL ERROR DURING TEST/CALIB.** (The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
THREE MILE ISL 1	2	0	0	1	2	0	0	NA
TROJAN	3	4	3	6	4	7	3	NA
TURKEY POINT 3	5	3	1	5	5	2	3	NA
TURKEY POINT 4	5	2	1	6	5	1	1	NA
VERMONT YANKEE	6	2	1	1	0	3	5	NA
VOGTLE 1	8	9	6	6	3	6	4	NA
VOGTLE 2	NA	NA	NA	NA	NA	NA	2	NA
WASH. NUCLEAR 2	3	3	2	4	4	3	1	NA
WATERFORD 3	5	2	0	11	3	2	1	NA
WOLF CREEK	7	5	0	2	2	1	5	NA
YANKEE-ROWE	1	0	1	1	0	2	1	NA
ZION 1	1	0	3	2	3	1	1	NA
ZION 2	4	0	1	1	2	7	1	NA

NA - The data were not available for this quarter.

**TABLE 9.18 CAUSE CODES - MAINTENANCE SUB-CATEGORIES**

**MAINTENANCE EQUIPMENT FAILURE**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
ARKANSAS 1	2	0	0	0	1	1	1	NA
ARKANSAS 2	0	0	0	1	0	3	0	NA
BEAVER VALLEY 1	1	2	2	1	1	0	2	NA
BEAVER VALLEY 2	3	3	1	1	2	0	2	NA
BIG ROCK POINT	0	0	1	1	1	0	0	NA
BRAIDWOOD 1	7	2	3	1	0	2	0	NA
BRAIDWOOD 2	NA	0	0	4	2	2	0	NA
BROWNS FERRY 1	4	1	1	0	1	6	3	NA
BROWNS FERRY 2	3	1	0	1	1	5	3	NA
BROWNS FERRY 3	2	3	0	0	1	5	3	NA
BRUNSWICK 1	1	1	2	0	0	3	0	NA
BRUNSWICK 2	1	2	6	0	1	2	1	NA
BYRON 1	2	1	0	1	3	1	1	NA
BYRON 2	6	0	1	2	4	1	1	NA
CALLAWAY	2	2	1	1	2	0	1	NA
CALVERT CLIFFS 1	0	1	0	1	0	0	0	NA
CALVERT CLIFFS 2	0	1	2	0	0	0	1	NA
CATAWBA 1	4	4	2	0	0	1	4	NA
CATAWBA 2	2	3	6	5	2	4	1	NA
CLINTON 1	3	2	5	6	2	1	2	NA
COOK 1	2	1	2	0	0	2	3	NA
COOK 2	4	2	1	1	0	0	4	NA
COOPER STATION	0	0	0	4	5	1	0	NA
CRYSTAL RIVER 3	4	0	1	1	0	0	0	NA
DAVIS-BESSE	0	1	0	0	0	1	0	NA
DIABLO CANYON 1	0	5	2	2	2	0	0	NA
DIABLO CANYON 2	0	1	2	2	0	1	0	NA
DRESDEN 2	5	1	0	1	2	3	3	NA
DRESDEN 3	5	0	1	3	0	0	2	NA
DUANE ARNOLD	2	1	1	0	1	0	1	NA
FARLEY 1	1	0	2	3	0	2	0	NA
FARLEY 2	0	3	0	1	0	1	0	NA
FERMI 2	3	2	2	4	2	2	0	NA
FITZPATRICK	4	1	0	2	2	1	1	NA
FORT CALHOUN	1	0	1	0	1	1	0	NA
FORT ST. VRAIN	NA	NA	NA	NA	NA	NA	NA	NA
GINNA	0	0	2	1	2	0	0	NA
GRAND GULF	0	0	3	0	0	0	1	NA
HADDAM NECK	1	1	1	1	2	2	0	NA
HATCH 1	3	0	1	2	0	1	0	NA
HATCH 2	6	1	2	2	1	2	0	NA
HOPE CREEK	3	0	1	2	1	2	0	NA
INDIAN POINT 2	0	2	1	1	1	0	0	NA
INDIAN POINT 3	1	0	0	1	0	0	1	NA
KEWAUNEE	1	0	1	1	0	0	0	NA
LASALLE 1	2	5	4	3	2	3	6	NA
LASALLE 2	2	3	2	3	3	4	4	NA
LIMERICK 1	3	7	0	3	0	0	0	NA
LIMERICK 2	NA	NA	NA	NA	NA	NA	NA	NA
MAINE YANKEE	0	0	1	0	1	0	0	NA



**TABLE 9.18 CAUSE CODES - MAINTENANCE SUB-CATEGORIES (CONTINUED)**

**MAINTENANCE EQUIPMENT FAILURE**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
MCGUIRE 1	1	3	1	3	4	5	1	NA
MCGUIRE 2	3	1	1	1	4	3	2	NA
MILLSTONE 1	4	0	1	0	2	2	0	NA
MILLSTONE 2	2	2	0	2	0	0	1	NA
MILLSTONE 3	0	1	1	2	1	2	0	NA
MONTICELLO	0	1	0	0	0	0	0	NA
NINE MILE PT. 1	1	2	2	1	0	0	0	NA
NINE MILE PT. 2	0	6	1	3	9	2	1	NA
NORTH ANNA 1	0	2	8	0	1	1	1	NA
NORTH ANNA 2	3	0	3	0	0	1	0	NA
OCONEE 1	0	2	2	0	0	0	0	NA
OCONEE 2	0	0	1	0	1	0	0	NA
OCONEE 3	0	0	1	1	1	0	1	NA
OYSTER CREEK	3	1	2	3	2	2	0	NA
PALISADES	2	0	0	0	0	2	0	NA
PALO VERDE 1	2	0	1	1	1	0	0	NA
PALO VERDE 2	0	1	1	0	0	1	1	NA
PALO VERDE 3	0	2	0	0	0	0	0	NA
PEACH BOTTOM 2	0	1	2	0	2	0	1	NA
PEACH BOTTOM 3	1	1	0	2	2	0	0	NA
PERRY	6	2	2	7	3	3	1	NA
PILGRIM	1	2	0	3	0	1	2	NA
POINT BEACH 1	0	1	0	0	0	0	0	NA
POINT BEACH 2	1	1	0	0	0	0	0	NA
PRAIRIE ISLAND 1	0	0	0	1	0	3	0	NA
PRAIRIE ISLAND 2	0	0	0	1	0	2	0	NA
QUAD CITIES 1	4	5	0	0	0	0	1	NA
QUAD CITIES 2	2	4	2	5	0	1	0	NA
RANCHO SECO	1	0	1	0	0	1	2	NA
RIVER BEND	1	1	1	1	1	3	3	NA
ROBINSON 2	2	2	1	4	0	1	1	NA
SALEM 1	0	0	2	0	1	2	2	NA
SALEM 2	0	0	3	4	1	3	1	NA
SAN ONOFRE 1	1	2	0	0	1	1	1	NA
SAN ONOFRE 2	0	1	5	4	1	1	1	NA
SAN ONOFRE 3	2	0	6	2	0	0	0	NA
SEABROOK	1	0	0	0	0	0	2	NA
SEQUOYAH 1	0	1	4	1	2	5	2	NA
SEQUOYAH 2	0	2	5	1	4	0	2	NA
SHEARON HARRIS	6	2	3	4	5	1	0	NA
SHOREHAM	1	0	0	0	2	0	1	NA
SOUTH TEXAS 1	2	3	3	1	3	0	0	NA
SOUTH TEXAS 2	NA	NA	NA	NA	NA	0	1	NA
ST. LUCIE 1	0	1	2	0	2	0	0	NA
ST. LUCIE 2	0	0	1	0	0	0	0	NA
SUMMER	3	0	0	0	0	0	0	NA
SURRY 1	5	8	4	5	6	4	0	NA
SURRY 2	4	2	5	6	3	3	0	NA
SUSQUEHANNA 1	0	2	0	2	4	0	0	NA
SUSQUEHANNA 2	0	1	2	0	4	0	0	NA

**TABLE 9.18 CAUSE CODES - MAINTENANCE SUB-CATEGORIES (CONTINUED)**

**MAINTENANCE EQUIPMENT FAILURE**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
THREE MILE ISL 1	0	0	0	0	0	1	0	NA
TROJAN	1	3	1	2	4	2	0	NA
TURKEY POINT 3	2	4	2	1	1	0	1	NA
TURKEY POINT 4	3	3	1	3	3	0	1	NA
VERMONT YANKEE	2	0	2	2	1	1	2	NA
VOGTLE 1	1	1	1	1	2	3	3	NA
VOGTLE 2	NA	NA	NA	NA	NA	NA	2	NA
WASH. NUCLEAR 2	2	0	0	1	1	2	0	NA
WATERFORD 3	3	0	2	2	0	0	0	NA
WOLF CREEK	3	1	0	0	1	1	1	NA
YANKEE-DOWE	0	2	0	0	0	2	0	NA
ZION 1	1	0	2	2	1	1	0	NA
ZION 2	3	1	1	0	1	5	0	NA

NA - The data were not available for this quarter.

**TABLE 9.19 CAUSE CODES - MAINTENANCE SUB-CATEGORIES**

**POTENTIAL MAINTENANCE PROBLEM**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
ARKANSAS 1	2	0	0	0	0	1	1	NA
ARKANSAS 2	0	0	0	0	0	2	1	NA
BEAVER VALLEY 1	1	3	2	0	1	0	1	NA
BEAVER VALLEY 2	1	4	1	1	1	0	3	NA
BIG ROCK POINT	1	0	0	0	1	0	0	NA
BRAIDWOOD 1	3	3	3	1	2	1	3	NA
BRAIDWOOD 2	NA	0	1	5	3	1	1	NA
BROWNS FERRY 1	6	1	2	1	2	6	0	NA
BROWNS FERRY 2	3	1	1	2	2	5	0	NA
BROWNS FERRY 3	0	2	1	1	2	5	0	NA
BRUNSWICK 1	0	0	2	0	1	5	0	NA
BRUNSWICK 2	2	0	3	0	2	2	1	NA
BYRON 1	3	1	1	1	3	1	0	NA
BYRON 2	4	0	2	3	3	0	0	NA
CALLAWAY	2	2	0	1	0	0	1	NA
CALVERT CLIFFS 1	0	1	0	0	0	0	0	NA
CALVERT CLIFFS 2	0	0	2	0	0	0	0	NA
CATAWBA 1	4	2	2	0	1	2	2	NA
CATAWBA 2	3	2	4	3	2	3	3	NA
CLINTON 1	2	1	4	0	1	1	0	NA
COOK 1	1	1	0	0	0	2	0	NA
COOK 2	3	2	0	0	0	0	0	NA
COOPER STATION	1	0	0	3	6	0	0	NA
CRYSTAL RIVER 3	2	1	4	1	0	0	0	NA
DAVIS-BESSE	0	1	2	0	0	1	1	NA
DIABLO CANYON 1	0	2	4	2	1	0	0	NA
DIABLO CANYON 2	3	1	2	2	1	2	0	NA
DRESDEN 2	4	1	1	2	2	3	3	NA
DRESDEN 3	3	0	0	3	0	1	1	NA
DUANE ARNOLD	2	0	1	0	2	0	1	NA
FARLEY 1	0	1	1	3	0	3	0	NA
FARLEY 2	0	2	0	1	0	1	0	NA
FERMI 2	2	1	2	4	3	2	3	NA
FITZPATRICK	3	1	0	2	1	0	0	NA
FORT CALHOUN	1	0	0	3	2	2	0	NA
FORT ST. VRAIN	NA	NA	NA	NA	NA	NA	NA	NA
GINNA	0	0	0	1	2	0	0	NA
GRAND GULF	1	2	4	0	1	1	0	NA
HADDAM NECK	1	1	0	1	1	2	0	NA
HATCH 1	2	1	1	2	0	1	0	NA
HATCH 2	4	1	2	3	1	1	0	NA
HOPE CREEK	4	1	1	1	1	2	1	NA
INDIAN POINT 2	0	3	1	0	3	0	0	NA
INDIAN POINT 3	0	1	0	1	0	0	0	NA
KEWAUNEE	1	0	1	1	1	0	0	NA
LASALLE 1	2	5	3	3	4	2	4	NA
LASALLE 2	3	3	2	3	5	4	3	NA
LIMERICK 1	2	6	1	2	0	1	1	NA
LIMERICK 2	NA	NA	NA	NA	NA	NA	NA	NA
MAINE YANKEE	1	0	1	0	1	0	1	NA

**TABLE 9.19 CAUSE CODES - MAINTENANCE (CONTINUED)**

**POTENTIAL MAINTENANCE PROBLEM**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
MCGUIRE 1	0	3	1	1	2	4	0	NA
MCGUIRE 2	2	0	0	1	1	0	2	NA
MILLSTONE 1	3	0	1	0	2	1	0	NA
MILLSTONE 2	2	0	0	2	0	0	0	NA
MILLSTONE 3	1	2	1	2	1	1	0	NA
MONTICELLO	0	0	1	0	0	0	1	NA
NINE MILE PT. 1	1	5	1	1	0	0	0	NA
NINE MILE PT. 2	4	3	2	3	6	3	0	NA
NORTH ANNA 1	1	2	5	0	1	0	0	NA
NORTH ANNA 2	3	1	2	0	0	0	1	NA
OCONEE 1	0	1	1	0	0	0	1	NA
OCONEE 2	0	0	1	0	1	0	1	NA
OCONEE 3	0	0	1	1	0	1	0	NA
OYSTER CREEK	3	2	0	0	2	2	0	NA
VALSADES	3	1	2	0	2	3	1	NA
PALO VERDE 1	1	0	1	1	1	2	0	NA
PALO VERDE 2	1	2	2	0	0	1	0	NA
PALO VERDE 3	0	2	0	0	0	0	1	NA
PEACH BOTTOM 2	2	2	2	0	2	2	0	NA
PEACH BOTTOM 3	1	0	0	1	1	0	0	NA
PERRY	3	3	1	6	4	2	1	NA
PILGRIM	0	1	1	1	0	2	1	NA
POINT BEACH 1	0	1	0	0	0	0	0	NA
POINT BEACH 2	1	2	0	0	0	0	1	NA
PRAIRIE ISLAND 1	1	0	0	1	0	1	0	NA
PRAIRIE ISLAND 2	1	0	0	1	0	2	0	NA
QUAD CITIES 1	5	3	0	0	0	1	1	NA
QUAD CITIES 2	3	5	3	4	1	1	0	NA
RANCHO SECO	2	0	0	1	0	2	1	NA
RIVER BEND	1	3	3	0	4	1	2	NA
ROBINSON 2	2	1	1	4	0	1	0	NA
SALEM 1	1	0	0	0	1	1	0	NA
SALEM 2	0	0	2	3	1	2	0	NA
SAN ONOFRE 1	1	1	3	0	1	0	1	NA
SAN ONOFRE 2	1	3	4	3	2	1	0	NA
SAN ONOFRE 3	1	0	4	1	1	1	0	NA
SEABROOK	1	0	0	0	0	1	1	NA
SEQUOYAH 1	0	1	2	1	2	3	1	NA
SEQUOYAH 2	0	2	5	1	4	1	0	NA
SHEARON HARRIS	3	1	1	2	3	0	0	NA
SHOREHAM	1	0	0	0	0	1	1	NA
SOUTH TEXAS 1	1	1	4	1	1	0	1	NA
SOUTH TEXAS 2	NA	NA	NA	NA	NA	0	1	NA
ST. LUCIE 1	0	0	2	1	0	0	0	NA
ST. LUCIE 2	0	0	1	0	0	0	0	NA
SUMMER	2	0	0	0	0	1	0	NA
SURRY 1	4	9	0	2	6	2	0	NA
SURRY 2	3	4	4	2	1	1	0	NA
SUSQUEHANNA 1	0	3	3	1	3	0	1	NA
SUSQUEHANNA 2	0	2	4	0	3	1	1	NA

**TABLE 9.19 CAUSE CODES - MAINTENANCE (CONTINUED)**

**POTENTIAL MAINTENANCE PROBLEM**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
THREE MILE ISL 1	0	0	0	0	0	1	0	NA
TROJAN	3	2	1	0	5	4	0	NA
TURKEY POINT 3	1	4	2	2	2	0	2	NA
TURKEY POINT 4	4	3	1	3	6	0	2	NA
VERMONT YANKEE	2	1	1	2	1	0	2	NA
VOGTLE 1	1	2	2	1	1	2	1	NA
VOGTLE 2	NA	NA	NA	NA	NA	NA	1	NA
WASH. NUCLEAR 2	2	0	0	2	0	1	0	NA
WATERFORD 3	0	1	2	0	0	0	3	NA
WOLF CREEK	2	1	0	0	0	0	1	NA
YANKEE-ROWE	0	2	2	1	0	2	0	NA
ZION 1	0	1	2	3	1	2	3	NA
ZION 2	1	1	1	1	1	2	1	NA

NA - The data were not available for this quarter.

**TABLE 9.20 CAUSE CODES**

**DESIGN/FABRICATION/INSTALLATION**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
ARKANSAS 1	0	3	2	0	5	4	3	NA
ARKANSAS 2	1	1	2	2	3	0	0	NA
BEAVER VALLEY 1	0	3	1	1	0	1	0	NA
BEAVER VALLEY 2	4	3	1	1	1	1	1	NA
BIG ROCK POINT	0	2	1	2	0	0	1	NA
BRAIDWOOD 1	3	1	1	0	0	2	0	NA
BRAIDWOOD 2	NA	0	2	1	2	2	0	NA
BROWNS FERRY 1	3	0	1	2	8	6	6	NA
BROWNS FERRY 2	3	0	1	2	8	6	7	NA
BROWNS FERRY 3	2	0	1	2	8	6	6	NA
BRUNSWICK 1	0	1	1	3	2	4	3	NA
BRUNSWICK 2	0	0	2	2	4	4	2	NA
BYRON 1	0	0	0	0	0	0	0	NA
BYRON 2	0	0	2	0	0	0	1	NA
CALLAWAY	2	0	1	0	1	1	1	NA
CALVERT CLIFFS 1	3	0	0	0	2	2	1	NA
CALVERT CLIFFS 2	2	1	1	1	0	1	0	NA
CATAWBA 1	4	2	5	3	0	3	4	NA
CATAWBA 2	2	1	5	4	0	3	4	NA
CLINTON 1	2	2	1	1	1	1	3	NA
COOK 1	1	2	0	0	2	1	1	NA
COOK 2	1	2	0	1	2	1	2	NA
COOPER STATION	2	2	3	1	0	0	6	NA
CRYSTAL RIVER 3	2	0	1	2	3	3	7	NA
DAVIS-BESSE	1	1	4	1	4	1	0	NA
DIABLO CANYON 1	1	2	0	2	3	2	1	NA
DIABLO CANYON 2	2	3	2	1	2	5	1	NA
DRESDEN 2	0	0	1	1	0	0	3	NA
DRESDEN 3	2	0	2	2	0	0	2	NA
DUANE ARNOLD	0	0	0	2	4	5	1	NA
FARLEY 1	4	3	1	2	1	0	0	NA
FARLEY 2	2	1	4	0	1	1	0	NA
FERMI 2	8	2	0	2	2	0	2	NA
FITZPATRICK	2	0	0	1	0	4	2	NA
FORT CALHOUN	0	1	1	1	3	4	1	NA
FORT ST. VRAIN	NA	NA	NA	NA	NA	NA	NA	NA
GINNA	0	2	0	0	1	0	0	NA
GRAND GULF	2	0	1	0	2	0	0	NA
HADDAM NECK	4	0	5	2	1	1	3	NA
HATCH 1	3	0	1	1	2	2	0	NA
HATCH 2	2	0	1	2	2	2	0	NA
HOPE CREEK	3	4	3	5	5	2	0	NA
INDIAN POINT 2	0	3	1	2	1	4	3	NA
INDIAN POINT 3	0	2	0	1	0	2	0	NA
KEWAUNEE	0	2	0	2	0	0	2	NA
LASALLE 1	4	2	0	3	2	2	4	NA
LASALLE 2	2	2	0	2	1	2	4	NA
LIMERICK 1	5	2	7	5	3	8	10	NA
LIMERICK 2	NA	NA	NA	NA	NA	NA	NA	NA
MAINE YANKEE	0	0	0	2	1	1	1	NA

**TABLE 9.20 CAUSE CODES (CONTINUED)**

**DESIGN/FABRICATION/INSTALLATION**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
MCQUIRE 1	6	4	2	3	6	5	3	NA
MCQUIRE 2	6	4	1	3	4	2	1	NA
MILLSTONE 1	2	1	2	1	0	1	3	NA
MILLSTONE 2	1	0	1	0	0	0	2	NA
MILLSTONE 3	0	0	4	0	0	1	1	NA
MONTICELLO	1	3	0	1	1	1	1	NA
NINE MILE PT. 1	0	3	3	2	1	1	0	NA
NINE MILE PT. 2	6	14	7	5	12	6	2	NA
NORTH ANNA 1	1	1	1	1	0	1	0	NA
NORTH ANNA 2	1	2	1	2	0	1	0	NA
OCONEE 1	1	2	3	2	1	1	3	NA
OCONEE 2	2	2	3	3	1	1	2	NA
OCONEE 3	1	2	2	2	1	1	2	NA
OYSTER CREEK	2	3	2	1	4	0	6	NA
PALISADES	3	3	0	3	1	2	3	NA
PALO VERDE 1	2	0	4	0	1	0	2	NA
PALO VERDE 2	2	1	3	1	3	2	2	NA
PALO VERDE 3	2	0	3	0	0	1	3	NA
PEACH BOTTOM 2	2	4	1	1	3	3	3	NA
PEACH BOTTOM 3	1	3	1	3	2	2	2	NA
PERRY	4	1	3	3	3	3	0	NA
PILGRIM	0	4	3	1	1	1	4	NA
POINT BEACH 1	0	0	2	1	2	0	1	NA
POINT BEACH 2	0	0	1	1	2	2	1	NA
PRAIRIE ISLAND 1	0	0	0	1	0	2	0	NA
PRAIRIE ISLAND 2	0	0	0	0	0	1	0	NA
QUAD CITIES 1	0	5	1	3	0	0	0	NA
QUAD CITIES 2	0	4	1	8	0	0	0	NA
RANCHO SECO	1	2	1	3	1	1	2	NA
RIVER BEND	0	2	2	1	0	2	2	NA
ROBINSON 2	2	4	3	2	2	4	1	NA
SALEM 1	0	4	5	2	3	0	1	NA
SALEM 2	0	3	1	3	3	1	3	NA
SAN ONOFRE 1	1	2	2	2	2	3	5	NA
SAN ONOFRE 2	3	2	3	2	4	3	1	NA
SAN ONOFRE 3	0	0	3	2	4	3	0	NA
SEABROOK	1	1	1	0	0	1	0	NA
SEQUOYAH 1	17	6	6	3	3	1	0	NA
SEQUOYAH 2	17	8	7	5	3	1	1	NA
SHEARON HARRIS	7	2	4	1	3	0	2	NA
SHOREHAM	1	3	0	0	0	1	0	NA
SOUTH TEXAS 1	2	4	6	6	8	4	5	NA
SOUTH TEXAS 2	NA	NA	NA	NA	NA	1	1	NA
ST. LUCIE 1	0	1	0	0	0	0	0	NA
ST. LUCIE 2	0	1	0	0	0	0	1	NA
SUMMER	3	2	3	1	0	2	1	NA
SURRY 1	4	2	2	2	4	3	1	NA
SURRY 2	1	1	0	4	3	4	1	NA
SUSQUEHANNA 1	1	0	0	1	2	1	1	NA
SUSQUEHANNA 2	3	0	2	1	2	1	1	NA

**TABLE 9.20 CAUSE CODES (CONTINUED)**

**DESIGN/FABRICATION/INSTALLATION**

(The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
THREE MILE ISL 1	0	0	1	0	0	0	0	NA
TROJAN	1	1	0	1	2	2	2	NA
TURKEY POINT 3	3	1	1	1	5	4	3	NA
TURKEY POINT 4	4	2	1	0	3	3	2	NA
VERMONT YANKEE	2	0	0	0	1	1	2	NA
VOGTLE 1	5	5	0	5	2	5	1	NA
VOGTLE 2	NA	NA	NA	NA	NA	NA	1	NA
WASH. NUCLEAR 2	4	1	3	5	4	0	3	NA
WATERFORD 3	3	1	1	4	0	4	2	NA
WOLF CREEK	4	4	1	4	4	6	1	NA
YANKEE-ROWE	0	0	0	0	0	2	0	NA
ZION 1	0	0	2	0	2	2	0	NA
ZION 2	0	0	1	0	2	3	0	NA

NA - The data were not available for this quarter.



**TABLE 9.21 CAUSE CODES**

**EQUIPMENT FAILURE (ELEC./ENVIRON.)** (The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
ARKANSAS 1	2	0	1	0	0	0	0	NA
ARKANSAS 2	0	0	0	0	0	0	0	NA
BEAVER VALLEY 1	0	1	0	0	0	0	1	NA
BEAVER VALLEY 2	2	0	0	0	2	0	0	NA
BIG ROCK POINT	0	0	0	0	0	1	0	NA
BRAIDWOOD 1	2	0	1	0	2	0	0	NA
BRAIDWOOD 2	NA	0	0	0	1	1	0	NA
BROWNS FERRY 1	2	0	0	0	0	0	0	NA
BROWNS FERRY 2	0	0	0	0	0	0	3	NA
BROWNS FERRY 3	1	0	0	0	0	0	0	NA
BRUNSWICK 1	0	0	0	0	0	0	0	NA
BRUNSWICK 2	0	0	0	0	0	0	0	NA
BYRON 1	0	0	0	0	2	0	1	NA
BYRON 2	1	0	0	1	2	0	0	NA
CALLAWAY	0	0	1	1	1	0	0	NA
CALVERT CLIFFS 1	0	1	0	0	0	0	0	NA
CALVERT CLIFFS 2	0	0	0	0	0	0	0	NA
CATAMBA 1	0	1	1	0	0	0	0	NA
CATAMBA 2	0	0	1	1	0	0	0	NA
CLINTON 1	2	0	0	1	0	1	0	NA
COOK 1	1	0	0	0	0	1	0	NA
COOK 2	2	0	0	0	0	0	0	NA
COOPER STATION	1	0	0	0	1	0	0	NA
CRYSTAL RIVER 3	1	1	0	0	0	0	0	NA
DAVIS-BESSE	1	0	0	0	1	0	1	NA
DIABLO CANYON 1	0	2	0	0	0	0	0	NA
DIABLO CANYON 2	0	0	0	0	0	0	1	NA
DRESDEN 2	1	0	0	0	1	0	2	NA
DRESDEN 3	0	0	0	0	0	0	1	NA
DUANE ARNOLD	0	0	0	0	0	0	1	NA
FARLEY 1	0	0	0	0	0	0	0	NA
FARLEY 2	0	0	0	0	0	0	0	NA
FERMI 2	0	0	1	0	0	0	0	NA
FITZPATRICK	0	0	0	0	0	0	0	NA
FORT CALHOUN	0	0	0	1	1	0	0	NA
FORT ST. VRAIN	NA	NA	NA	NA	NA	NA	NA	NA
GINNA	0	0	0	1	2	0	0	NA
GRAND GULF	0	1	1	0	0	0	1	NA
HADDAM NECK	0	0	0	0	0	0	0	NA
HATCH 1	1	0	0	0	1	0	1	NA
HATCH 2	1	0	0	0	1	0	0	NA
HOPE CREEK	1	0	0	0	0	2	0	NA
INDIAN POINT 2	0	0	0	0	0	0	0	NA
INDIAN POINT 3	0	0	0	0	0	0	0	NA
KEWAUNEE	0	0	0	0	0	0	0	NA
LASALLE 1	0	0	0	0	0	0	0	NA
LASALLE 2	0	0	0	0	0	0	0	NA
LIMERICK 1	0	0	0	0	0	0	0	NA
LIMERICK 2	NA	NA	NA	NA	NA	NA	NA	NA
MAINE YANKEE	0	0	0	0	0	0	0	NA

**TABLE 9.21 CAUSE CODES (CONTINUED)**

**EQUIPMENT FAILURE (ELEC./ENVIRON.)** (The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
MCGUIRE 1	0	1	0	1	0	0	1	NA
MCGUIRE 2	0	1	0	0	0	0	1	NA
MILLSTONE 1	0	0	0	0	0	0	0	NA
MILLSTONE 2	0	0	0	0	0	0	0	NA
MILLSTONE 3	0	0	0	0	0	1	0	NA
MONTICELLO	0	0	0	0	0	0	0	NA
NINE MILE PT. 1	0	0	0	0	0	0	1	NA
NINE MILE PT. 2	0	0	0	1	4	0	1	NA
NORTH ANNA 1	0	1	1	0	0	0	0	NA
NORTH ANNA 2	0	1	1	0	0	0	0	NA
OCONEE 1	0	0	0	0	0	0	0	NA
OCONEE 2	0	0	0	0	0	0	0	NA
OCONEE 3	0	0	0	0	0	0	0	NA
CYSTER CREEK	0	0	0	0	0	0	1	NA
PALISADES	1	0	0	0	0	0	0	NA
PALO VERDE 1	0	0	0	1	0	0	1	NA
PALO VERDE 2	0	0	0	0	0	0	1	NA
PALO VERDE 3	0	2	0	0	0	0	1	NA
PEACH BOTTOM 2	3	2	0	0	1	0	0	NA
PEACH BOTTOM 3	1	0	0	0	0	0	0	NA
PERRY	1	0	0	0	0	1	0	NA
PILGRIM	1	0	0	0	0	0	0	NA
POINT BEACH 1	0	0	0	0	0	0	0	NA
POINT BEACH 2	0	0	0	0	0	0	0	NA
PRAIRIE ISLAND 1	0	0	0	0	0	0	0	NA
PRAIRIE ISLAND 2	0	0	0	0	0	0	1	NA
QUAD CITIES 1	0	0	0	0	0	0	0	NA
QUAD CITIES 2	0	0	1	1	0	0	0	NA
RANCHO SECO	0	0	0	0	0	0	0	NA
RIVER BEND	1	1	0	0	0	0	0	NA
ROBINSON 2	0	0	0	1	0	0	1	NA
SALEM 1	0	0	0	0	0	1	1	NA
SALEM 2	0	0	0	3	0	1	1	NA
SAN ONOFRE 1	0	0	0	0	0	0	0	NA
SAN ONOFRE 2	0	0	0	1	0	1	1	NA
SAN ONOFRE 3	0	0	0	0	0	1	0	NA
SEABROOK	0	0	0	0	0	0	0	NA
SEQUOYAH 1	1	0	0	0	0	0	0	NA
SEQUOYAH 2	1	1	1	0	2	0	0	NA
SHEARON HARRIS	0	0	0	0	0	0	1	NA
SHOREHAM	0	0	0	0	0	0	0	NA
SOUTH TEXAS 1	1	2	1	0	0	0	0	NA
SOUTH TEXAS 2	NA	NA	NA	NA	NA	0	0	NA
ST. LUCIE 1	0	0	0	0	0	0	0	NA
ST. LUCIE 2	0	0	0	0	0	0	1	NA
SUMMER	0	1	0	0	0	0	0	NA
SURRY 1	1	2	0	0	1	1	1	NA
SURRY 2	1	1	1	1	0	1	1	NA
SUSQUEHANNA 1	0	0	0	0	1	0	1	NA
SUSQUEHANNA 2	0	0	0	0	1	0	1	NA

**TABLE 9.21 CAUSE CODES (CONTINUED)**

**EQUIPMENT FAILURE (ELEC./ENVIRON.)** (The latest quarter data are preliminary)

Plant Name	Year - Calendar Quarter							
	87-3	87-4	88-1	88-2	88-3	88-4	89-1	89-2
THREE MILE ISL 1	0	0	0	0	0	0	0	NA
TROJAN	0	0	0	0	0	1	0	NA
TURKEY POINT 3	0	0	0	0	1	0	0	NA
TURKEY POINT 4	0	0	0	0	0	0	0	NA
VERMONT YANKEE	0	0	0	0	0	0	0	NA
VOGTLE 1	0	0	0	0	1	0	1	NA
VOGTLE 2	NA	NA	NA	NA	NA	NA	1	NA
WASH. NUCLEAR 2	0	0	0	0	1	0	0	NA
WATERFORD 3	1	0	0	0	0	0	0	NA
WOLF CREEK	0	0	0	0	0	0	0	NA
YANKEE-ROWE	0	0	1	0	0	0	0	NA
ZION 1	0	0	0	0	0	0	0	NA
ZION 2	0	0	0	0	0	1	0	NA

NA - The data were not available for this quarter.

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10. REVISION OF DATA  
CONTAINED IN THE  
AUGUST 1989 REPORT

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## 10. REVISION OF DATA CONTAINED IN THE AUGUST 1989 REPORT

An intensive review of data sources and application of detailed screening criteria have resulted in some changes to the data previously reported in the July 1989 issue of the report. These changes are summarized in Tables 10.1 through 10.8. In aggregate, they do not significantly alter the overall picture presented in the July 1989 report.

**TABLE 10.1 REVISIONS TO SCRAMS ABOVE 15% POWER/1000  
CRITICAL HOURS  
(TABLE 10-3 OF THE JULY 1989 REPORT)**

<u>Plant Name</u>	<u>Quarter-Year</u>	<u>Old Value</u>	<u>Revised Value</u>
CALVERT CLIFFS 1	3-88	0.93	0.94
DAVIS-BESSE	3-87	1.03	1.04
FARLEY 1	4-88	0.46	0.45
LIMERICK 1	3-87	2.48	2.56
MILLSTONE 3	2-88	0.53	0.54
MONTICELLO	3-87	0.46	0.45
SEQUOYAH 1	4-88	2.64	2.63
SEQUOYAH 2	2-88	5.09	5.10
ZION 1	1-89	0.66	0.65
ZION 2	4-88	4.65	4.65

**TABLE 10.2 REVISIONS TO SAFETY SYSTEM ACTUATIONS  
(TABLE 10-5 OF THE JULY 1989 REPORT)**

<u>Plant Name</u>	<u>Quarter-Year</u>	<u>Old Value</u>	<u>Revised Value</u>
ARKANSAS 1	1-89	0	1
GRAND GULF	1-89	0	1
RANCHO SECO	1-89	0	1

**TABLE 10.3 REVISIONS TO SIGNIFICANT EVENTS**  
(TABLE 10-6 OF THE JULY 1989 REPORT)

<u>Plant Name</u>	<u>Quarter-Year</u>	<u>Old Value</u>	<u>Revised Value</u>
CATAWBA 1	2-88	1	2
MILLSTONE 1	1-89	0	1
NINE MILE PT. 2	1-89	1	2
PERRY	1-89	0	1
SAN ONOFRE 1	1-89	3	2

**TABLE 10.4 REVISIONS TO SAFETY SYSTEM FAILURES**  
(TABLE 10-7 OF THE JULY 1989 REPORT)

<u>Plant Name</u>	<u>Quarter-Year</u>	<u>Old Value</u>	<u>Revised Value</u>
CRYSTAL RIVER 3	1-89	1	2
DIABLO CANYON 1	1-89	2	1
DIABLO CANYON 2	1-89	3	2
DRESDEN 2	1-89	3	2
FITZPATRICK	1-89	3	4
FORT ST. VRAIN	1-89	0	1
HADDAM NECK	1-88	4	3
HADDAM NECK	1-89	1	2
HATCH 1	1-89	2	1
HATCH 2	1-89	2	0
INDIAN POINT 2	1-89	0	1
MCGUIRE 1	1-89	1	2
MCGUIRE 2	1-89	0	1
MILLSTONE 1	1-89	1	2
OYSTER CREEK	1-89	2	3
PALISADES	4-88	1	2
PALO VERDE 2	1-88	1	2
PEACH BOTTOM 2	1-89	1	3
QUAD CITIES 1	2-88	1	2
RANCHO SECO	2-88	0	1
RANCHO SECO	1-89	2	4
RIVER BEND	1-89	0	1
SEABROOK	1-89	0	1
TROJAN	1-89	1	0
VERMONT YANKEE	1-89	2	3
VOGTLE 1	1-89	1	3
VOGTLE 2	1-89	1	2
WASH. NUCLEAR 2	1-89	2	1
ZION 1	1-89	0	1



**TABLE 10.5 REVISIONS TO FORCED OUTAGE RATE  
(TABLE 10-8 OF THE JULY 1989 REPORT)**

<u>Plant Name</u>	<u>Quarter-Year</u>	<u>Old Value</u>	<u>Revised Value</u>
BEAVER VALLEY 2	4-87	17	11
BIG ROCK POINT	3-87	6	5
BRAIDWOOD 1	1-89	3	4
BYRON 2	3-87	21	22
CALVERT CLIFFS 1	1-89	7	4
CLINTON	4-87	NA	0
CLINTON	1-88	NA	0
CLINTON	2-88	NA	10
CLINTON	3-88	NA	2
CLINTON	4-88	NA	15
CLINTON	1-89	NA	0
FORT ST. VRAIN	4-87	89	90
LASALLE 1	4-87	3	4
PALISADES	3-87	22	23
PALO VERDE 2	1-89	32	17
PERRY	4-87	38	26
ROBINSON 2	3-87	22	23
SOUTH TEXAS 1	3-88	15	20
TURKEY POINT 3	4-87	93	94
VERMONT YANKEE	4-87	3	4
VOGTLE 1	3-87	11	7

**TABLE 10.6 REVISIONS TO EQUIPMENT FORCED OUTAGES/1000  
CRITICAL HOURS  
(TABLE 10-9 OF THE JULY 1989 REPORT)**

<u>Plant Name</u>	<u>Quarter-Year</u>	<u>Old Value</u>	<u>Revised Value</u>
ARKANSAS 1	4-88	2.39	2.38
BEAVER VALLEY 2	4-87	4.66	1.04
BIG ROCK POINT	2-88	4.42	4.43
BRAIDWOOD 1	1-89	1.21	0.61
BRAIDWOOD 2	4-88	2.21	1.98
BYRON 2	3-87	1.29	1.54
CALVERT CLIFFS 1	1-89	2.06	1.37
CATAWBA 1	4-88	5.00	8.74
CATAWBA 2	1-88	5.29	5.30
CLINTON	4-87	NA	3.41
CLINTON	1-88	NA	2.67
CLINTON	2-88	NA	0.71
CLINTON	3-88	NA	0.46
CLINTON	4-88	NA	1.03
CLINTON	1-89	NA	4.69
DAVIS-BESSE	3-87	0.00	0.52
DIABLO CANYON 1	3-88	0.51	0.52
DUANE ARNOLD	4-88	5.00	5.80
FORT ST. VRAIN	4-87	6.05	2.02
LIMERICK 1	3-87	3.73	2.56
MONTICELLO	3-87	0.45	0.46
NINE MILE PT. 2	2-88	1.56	1.69
NORTH ANNA 1	3-87	3.88	3.87
OCONEE 1	1-89	1.83	1.84
OYSTER CREEK	1-89	5.00	15.75
PALISADES	3-87	2.84	3.40
PALISADES	1-89	1.38	0.69
PERRY	4-87	2.14	3.70
POINT BEACH 1	4-87	0.00	0.46
SALEM 2	4-88	6.58	6.57
SOUTH TEXAS 1	3-88	4.61	4.81
ST. LUCIE 2	3-87	0.00	0.45
ST. LUCIE 2	4-87	2.24	3.35
SURRY 1	4-87	1.54	1.03
SUSQUEHANNA 1	3-87	0.00	0.59
SUSQUEHANNA 2	4-88	4.08	4.09
TURKEY POINT 3	3-87	6.27	6.26
TURKEY POINT 3	4-87	5.00	18.47
TURKEY POINT 3	1-88	3.01	3.02
TURKEY POINT 3	4-88	0.00	92.17
WASH. NUCLEAR 2	3-87	1.21	1.81

**TABLE 10.7 REVISIONS TO COLLECTIVE RADIATION EXPOSURE  
(TABLE 10-10 OF THE JULY 1989 REPORT)**

<u>Plant Name</u>	<u>Quarter-Year</u>	<u>Old Value</u>	<u>Revised Value</u>
BEAVER VALLEY 1	1-88	453	483
BROWNS FERRY 1	4-88	77	76
BROWNS FERRY 2	4-88	77	76
BROWNS FERRY 3	4-88	77	76
BYRON 1	3-88	186	156
BYRON 1	4-88	269	191
CATAWBA 1	4-88	117	98
CATAWBA 2	4-88	117	98
COOK 1	4-88	147	74
COOK 2	4-88	147	74
DRESDEN 2	4-88	196	343
DRESDEN 3	4-88	196	343
DUANE ARNOLD	4-88	541	526
HADDAM NECK	3-87	22	529
INDIAN POINT 2	4-88	33	32
MCGUIRE 1	4-88	288	281
MCGUIRE 2	4-88	288	281
MILLSTONE 1	3-88	7	6
MILLSTONE 3	1-88	56	55
MONTICELLO	1-88	48	47
NINE MILE PT. 1	2-88	226	236
OCONEE 1	4-88	27	24
OCONEE 2	4-88	27	24
OCONEE 3	4-88	27	24
OYSTER CREEK	4-83	1127	1131
PILGRIM	4-88	77	75
RANCHO SECO	4-88	27	19
SAN ONOFRE 1	4-88	69	62
SAN ONOFRE 2	4-88	69	62
SAN ONOFRE 3	4-88	69	62
SEQUOYAH 1	4-88	22	19
SEQUOYAH 2	4-88	22	19
SUMMER	4-88	491	464
TURKEY POINT 3	4-88	244	228
TURKEY POINT 4	4-88	244	228
VERMONT YANKEE	4-88	60	38
WOLF CREEK	4-88	240	229
YANKEE-ROWE	4-88	194	195
ZION 1	4-88	242	241
ZION 2	4-88	242	241

**TABLE 10.8 REVISIONS TO CRITICAL HOURS  
(TABLE 10-11 OF THE JULY 1989 REPORT)**

<u>Plant Name</u>	<u>Quarter-Year</u>	<u>Old Value</u>	<u>Revised Value</u>
LIMERICK 1	3-87	805	781