

December 19, 1995

LICENSEE: Southern California Edison Company

FACILITY: San Onofre Nuclear Generating Station, Units 2 and 3

SUBJECT: SUMMARY OF DECEMBER 5, 1995, MEETING WITH SOUTHERN CALIFORNIA EDISON

A meeting was held on December 5, 1995, to discuss the performance of the Operations Department at San Onofre Nuclear Generating Station (SONGS). Attached are a list of attendees and a copy of the slides presented at the meeting.

Ray Waldo, the Operations Manager for SONGS, discussed the self-assessment and actions taken by the licensee as a result of the April 6, 1995, misalignment event, which allowed approximately 620 gallons of reactor coolant system coolant to be diverted to the refueling water storage tank. The discussion included changes made to improve command and control activities in the control room. Dr. Waldo outlined the changes made before the 1995 outage for Unit 3 and the improvement in operator performance observed as a result.

Eva A. Brown, Intern
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-360
and 50-361

Attachments: 1. Attendance List
2. Slides

cc w/atts: See next page

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K. Perkins, WCFO

w/Att 1:

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OGC E. Jordan, D/AEOD
ACRS J. Mitchell, EDO 017G21
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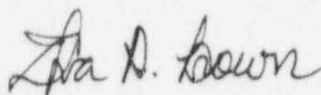
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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A handwritten signature in cursive script that reads "Eva A. Brown".

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Southern California Edison Company
San Onofre Nuclear Generating Station

cc w/atts:

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State Department of Health Services
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Mayor
City of San Clemente
100 Avenida Presidio
San Clemente, California 92672

Mr. Harold B. Ray
Senior Vice President
Southern California Edison Company
P.O. Box 128
San Clemente, CA 92674-0128

MEETING WITH SOUTHERN CALIFORNIA EDISON COMPANY
TO DISCUSS THE PERFORMANCE OF THE OPERATIONS DEPARTMENT AT SONGS
DECEMBER 5, 1995
ATTENDANCE LIST

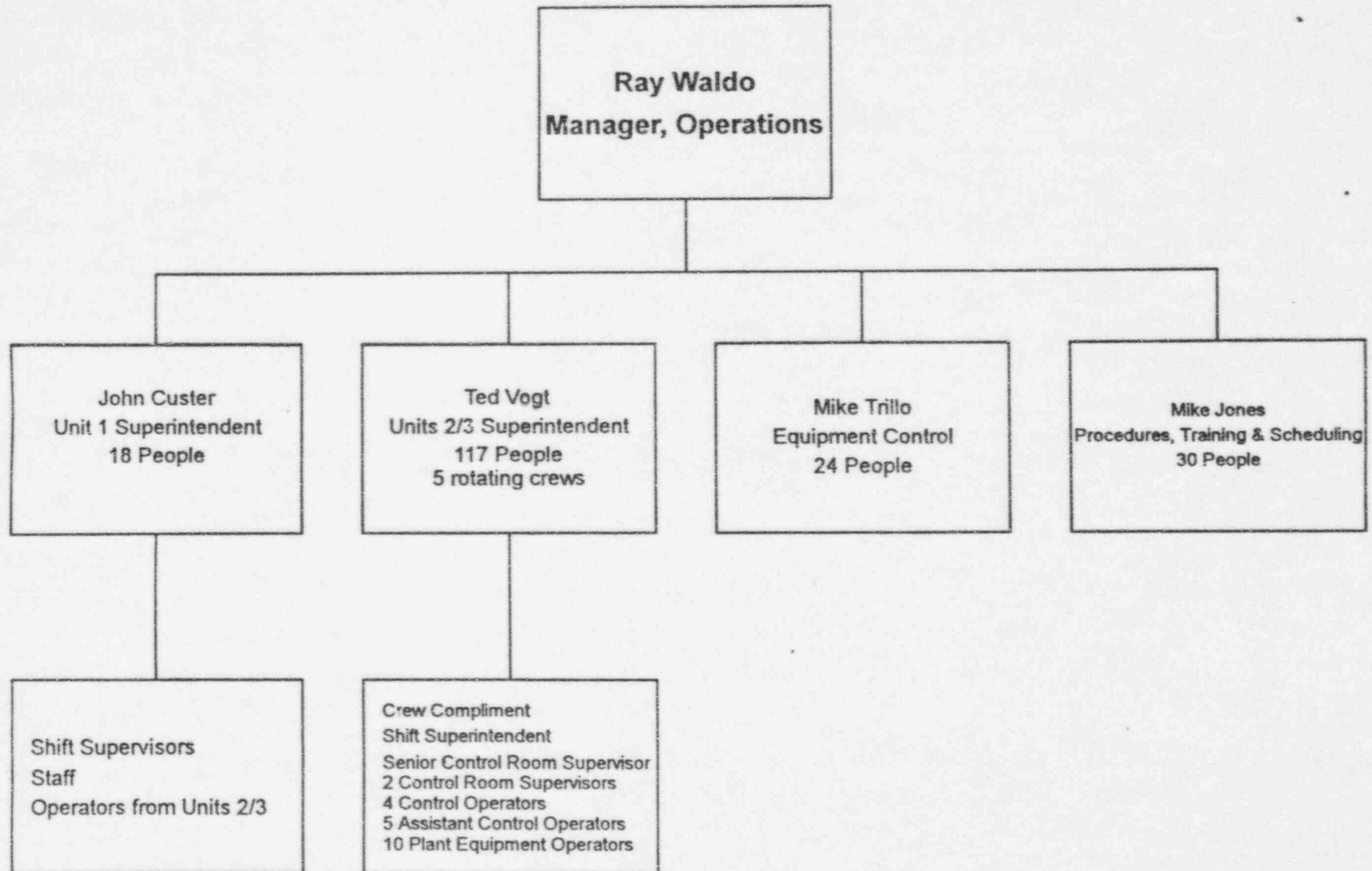
Southern California Edison Company

R. Waldo

NRC

J. Roe
W. Bateman
M. Fields
D. Desaulniers
E. Brown

OPERATIONS



PERFORMANCE MONITORING

- Identify trends and weaknesses in performance

PERFORMANCE MONITORING

WIDE VARIETY OF PARAMETERS MONITORED

HUMAN PERFORMANCE MONITORED IN SEVERAL WAYS

LOW THRESHOLD

OPERATIONS PERFORMANCE ANNUNCIATORS

Field Corrected
Errors G

NRC Regulatory
Performance
(NOV or LER) Y

SAFETY
Industrial
Accidents G

SAFETY
Lost Time
Accidents G

ODER/Near Miss
Corrective Actions Y

Quality WARs R

Procedures –
Permanent PMPs *

CARs/PRRs G

OPG Procedure
Commitment *

DCP Procedure
Commitment *

Operator Work
Arounds – TFM's G

Operator Work
Arounds – 0-23s Y

Operator Work
Arounds –
Steam Traps G

Operator Work
Arounds – ACAs Y

Operator Work
Arounds – ASCs G

Operator Work
Arounds – Ctrl Rm
Deficiencies R

Unit 2 Plant Vent
Stack Activity
(uCi/sec) B

Unit 3 Plant Vent
Stack Activity
(uCi/sec) G

Unit 2 Leak Rate
(gpm) G

Unit 3 Leak Rate
(gpm) G

ALARA G

* – Future
– Evaluation in Progress

CREW A

CREW B

CREW C

CREW D

CREW E

DOCUMENT DEFICIENCIES
G

DOCUMENT DEFICIENCIES
R

DOCUMENT DEFICIENCIES
Y

DOCUMENT DEFICIENCIES
G

DOCUMENT DEFICIENCIES
Y

ATTENDANCE
R

ATTENDANCE
Y

ATTENDANCE
R

ATTENDANCE
R

ATTENDANCE
Y

SFTY MTGS
R

SFTY MTGS
Y

SFTY MTGS
Y

SFTY MTGS
Y

SFTY MTGS
R

WORK RULES
Y

WORK RULES
G

WORK RULES
B

WORK RULES
G

WORK RULES
Y

POD
(OUTAGE)

POD
(OUTAGE)

POD
(OUTAGE)

POD
(OUTAGE)

POD
(OUTAGE)

EVENTS
G

EVENTS
G

EVENTS
R

EVENTS
B

EVENTS
R

SUPV OBSV
B

SUPV OBSV
B

SUPV OBSV
B

SUPV OBSV
B

SUPV OBSV
B

SAFETY
Y

SAFETY
G

SAFETY
B

SAFETY
G

SAFETY
G

HSKPG
G

HSKPG
G

HSKPG
G

HSKPG
G

HSKPG
G

OJT
(OUTAGE)

OJT
(OUTAGE)

OJT
(OUTAGE)

OJT
(OUTAGE)

OJT
(OUTAGE)

PERFORMANCE RESULTS

EXPECTED FREQUENCY/SIGNIFICANCE RELATIONSHIP

AS PERFORMANCE IMPROVES WE LOWER EVALUATION THRESHOLD

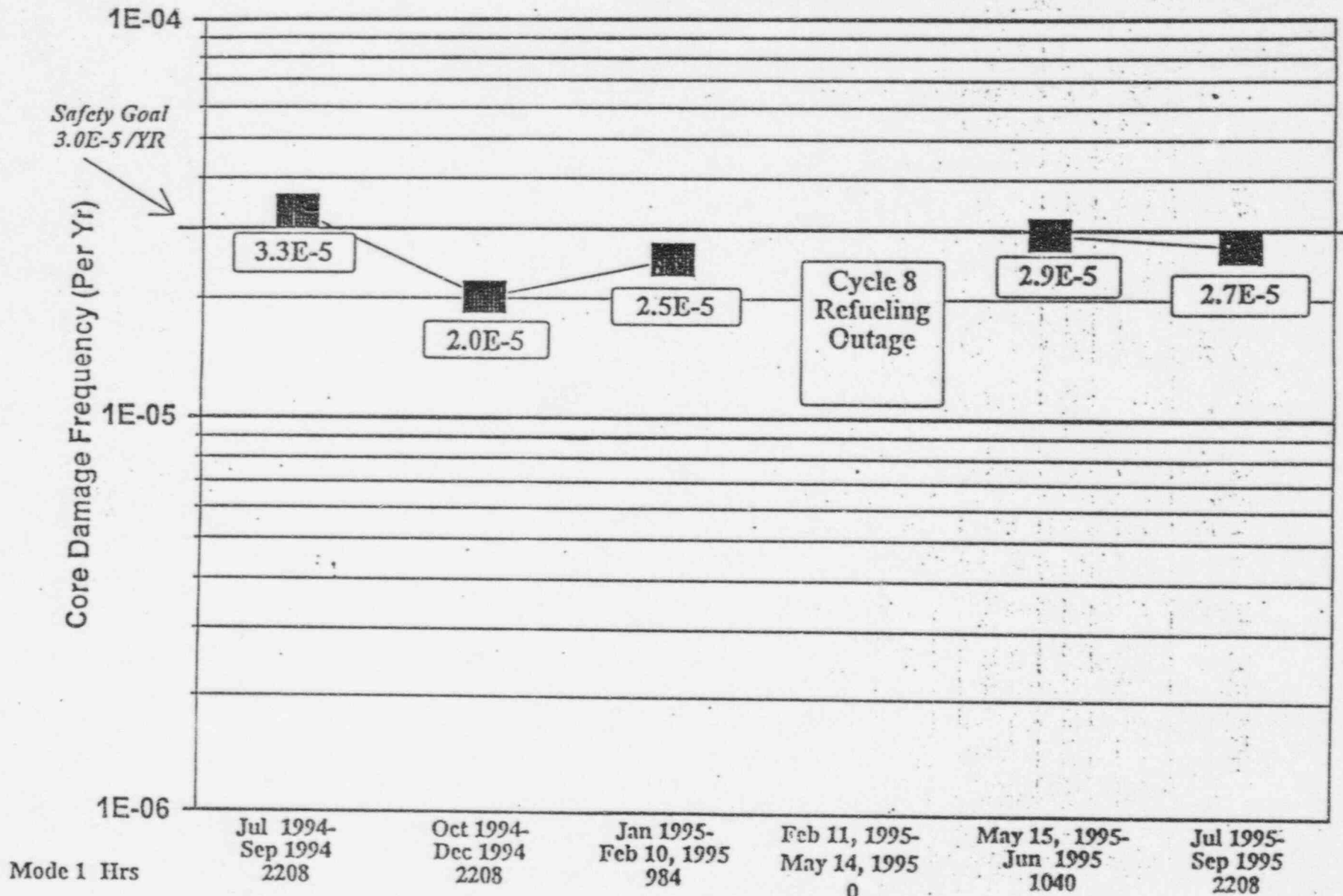
SHORT TERM ACTIONS --- IMPROVED PERFORMANCE

IN CURRENT AND FOLLOWING UNIT 3 OUTAGE

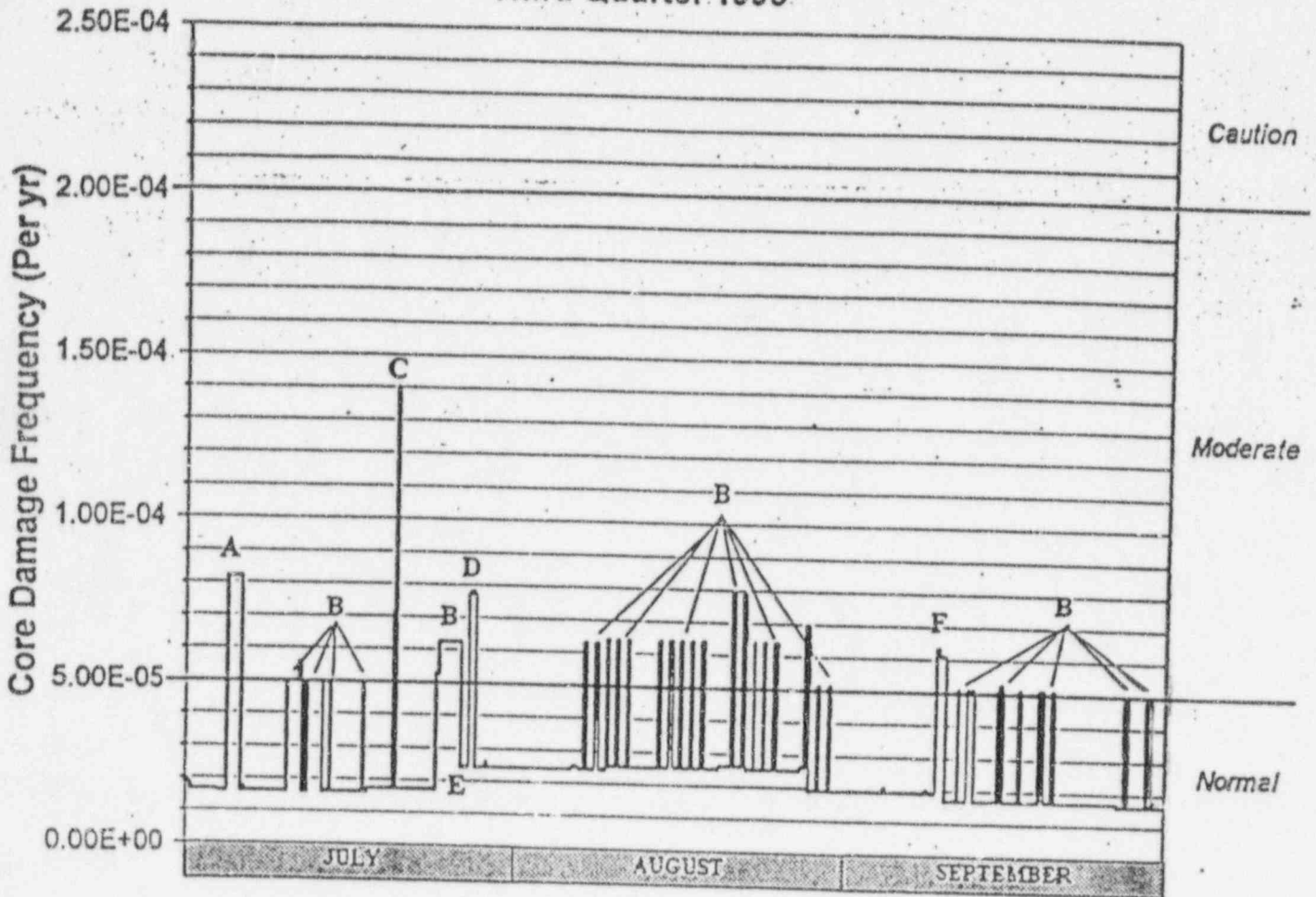
LONG TERM ACTIONS --- IMPROVED PERFORMANCE BETWEEN CYCLES

SHUTDOWN COOLING FLOW DIVERSION NOTABLE

TREND IN ESTIMATED PROBABILISTIC RISK UNIT 2



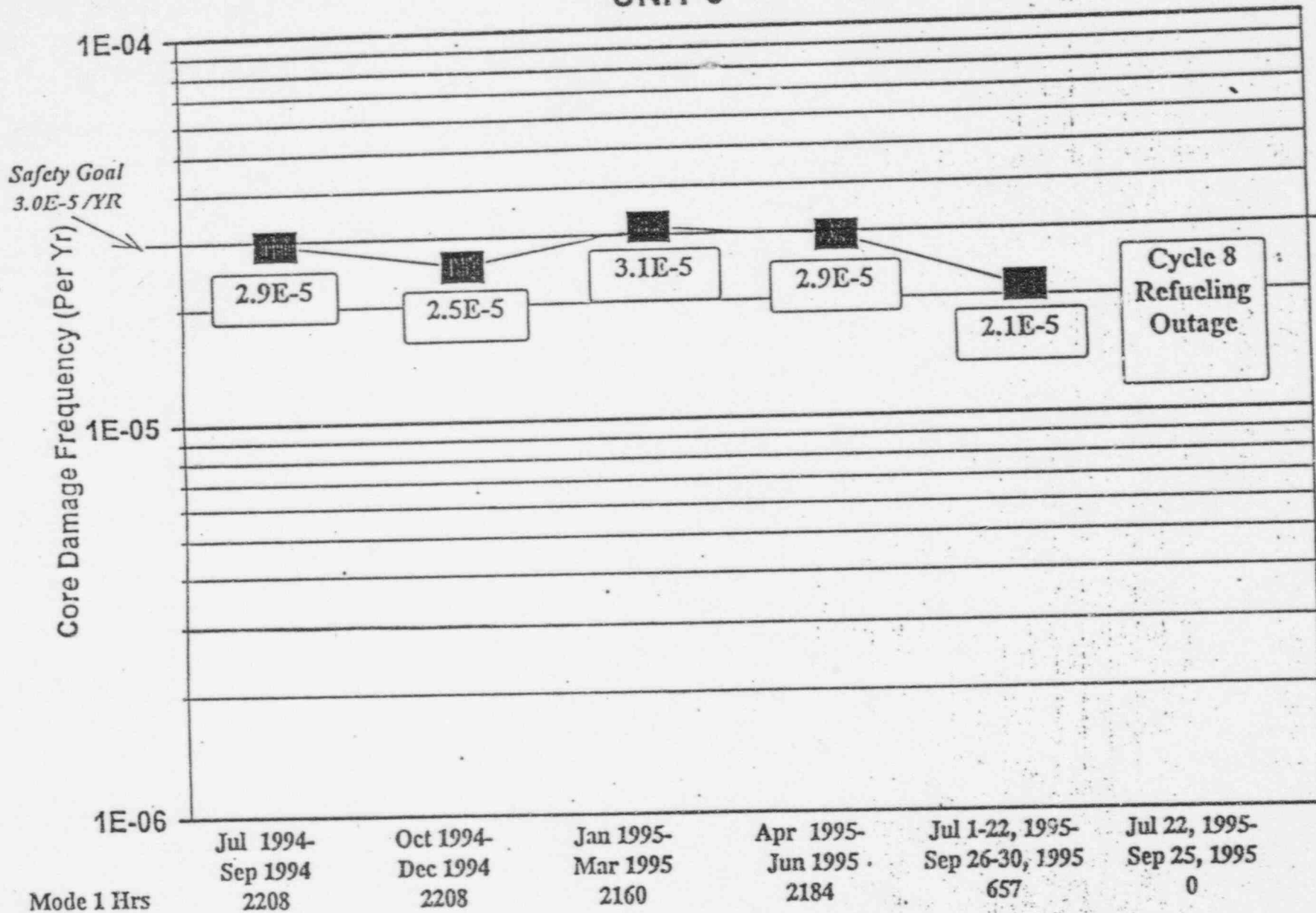
UNIT 2
INSTANTANEOUS CORE DAMAGE RISK GRAPH
 Third Quarter 1995



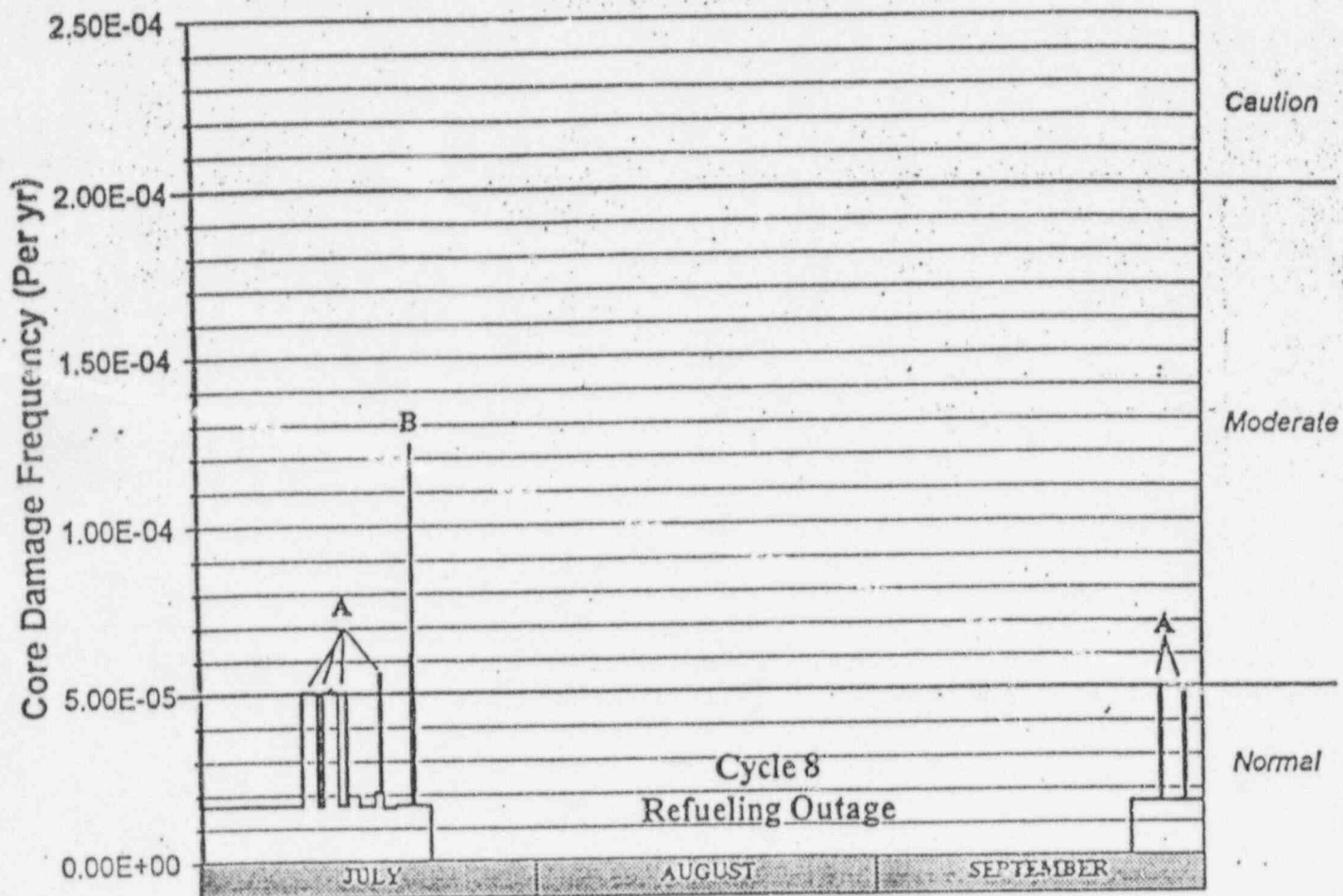
- (A) CCW Train B Heat Exchanger 2E002 Corrective Maintenance (Tube Leak Repair)
- (B) Switchyard Maintenance
- (C) Switchyard Maintenance and Emergency Chilled Water Pump P162 Preventive Maintenance
- (D) Emergency Chiller Room Exhaust Fan Investigative Maintenance (Tripping)
- (E) SWC Pumps 2P114 and 2P307 OOS due to Dewatered Unit 3 Intake Structure
- (F) Train B Emergency Chiller Unit ME335 Maintenance

Core Damage Frequency calculated for Mode 1 Operations only.
 Third Quarter 1995 Average Core Damage Frequency = 2.7E-5 /yr

TREND IN ESTIMATED PROBABILISTIC RISK UNIT 3



UNIT 3 INSTANTANEOUS CORE DAMAGE RISK GRAPH Third Quarter 1995

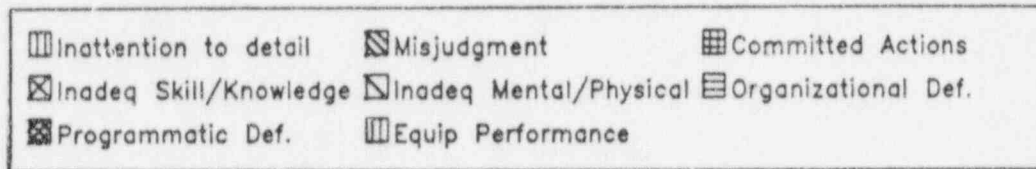
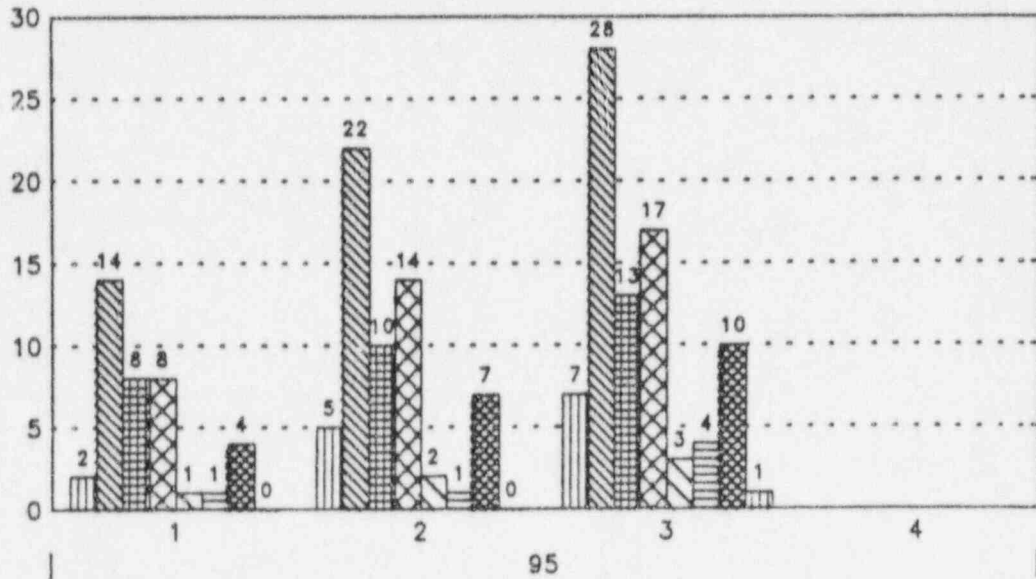


- (A) Switchyard Maintenance
- (B) Switchyard Maintenance and Emergency Chilled Water Pump P162 Preventive Maintenance

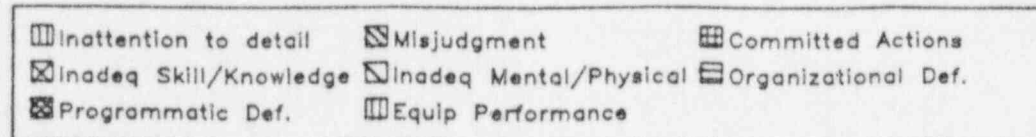
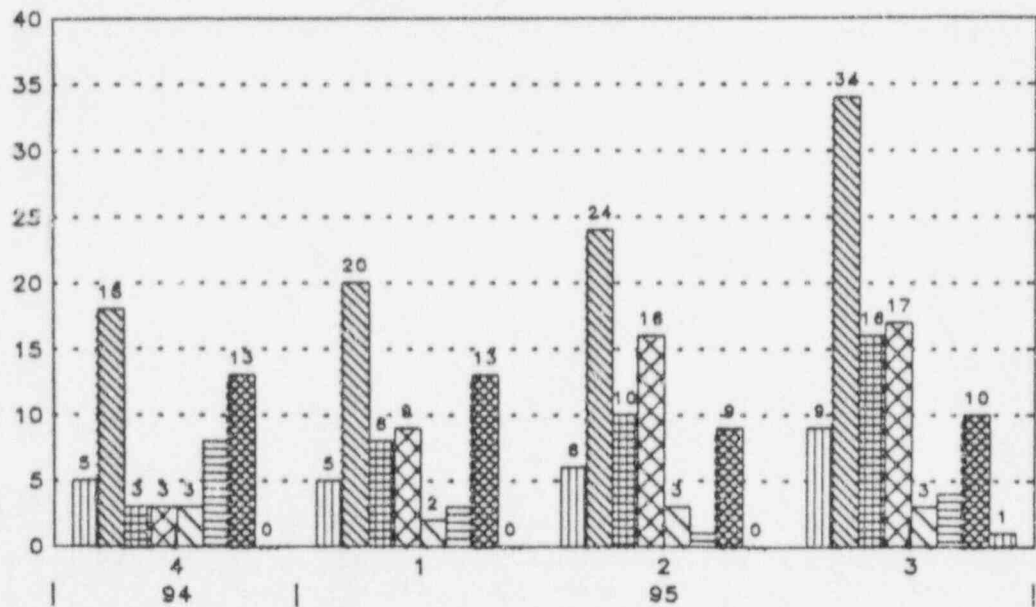
Core Damage Frequency calculated for Mode 1 Operations only.
 First Quarter 1995 Average Core Damage Frequency = $2.1E-5$ /yr

OPERATIONS

ODERs by Root Cause Evaluation Categories



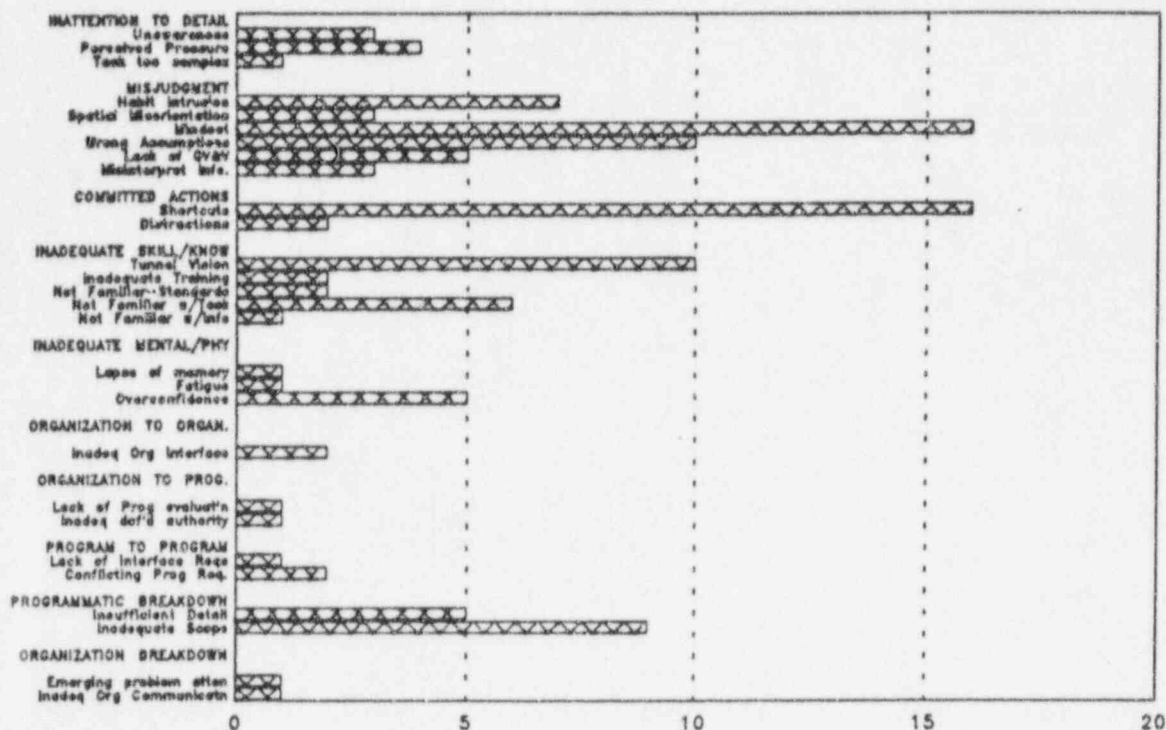
1995 Annual Accumulation by Quarter



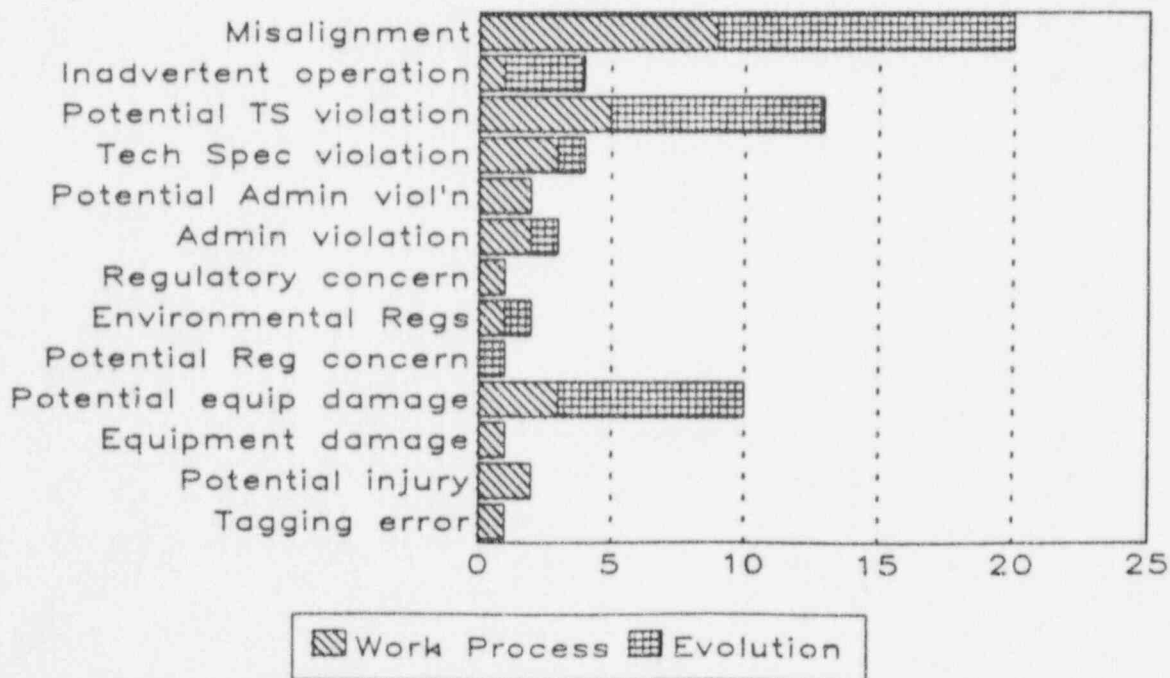
12 Month Running Accumulation

OPERATIONAL EVENTS

Cause and Effect
(HEIA Failure Modes)



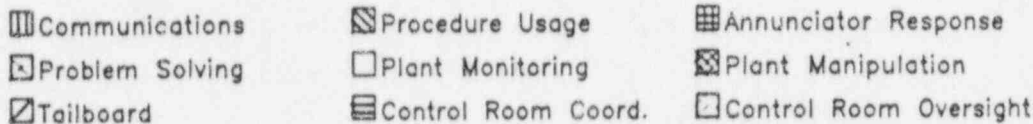
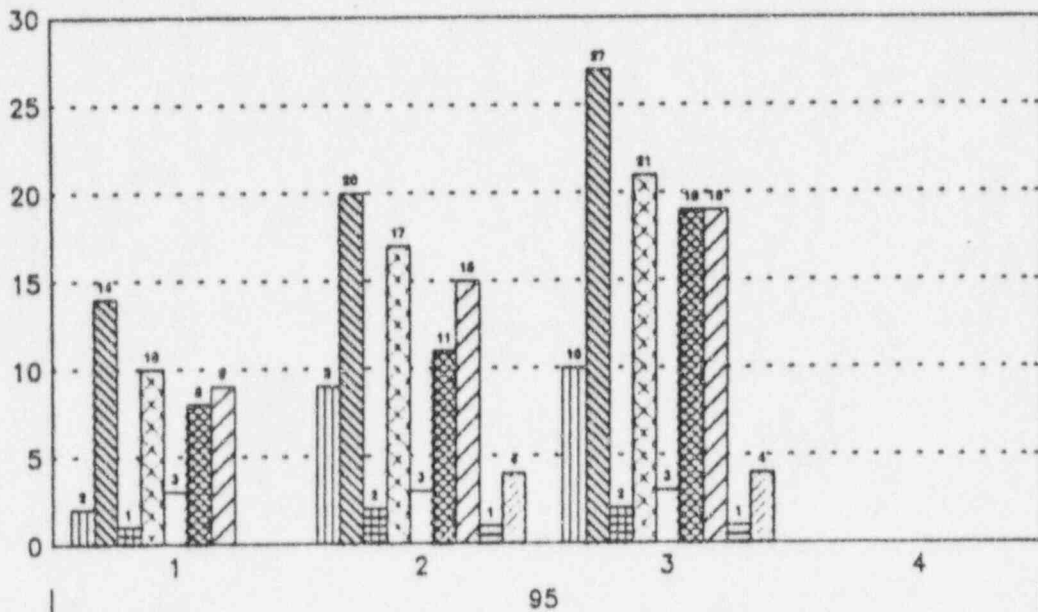
1985 accumulation
9503



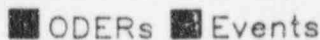
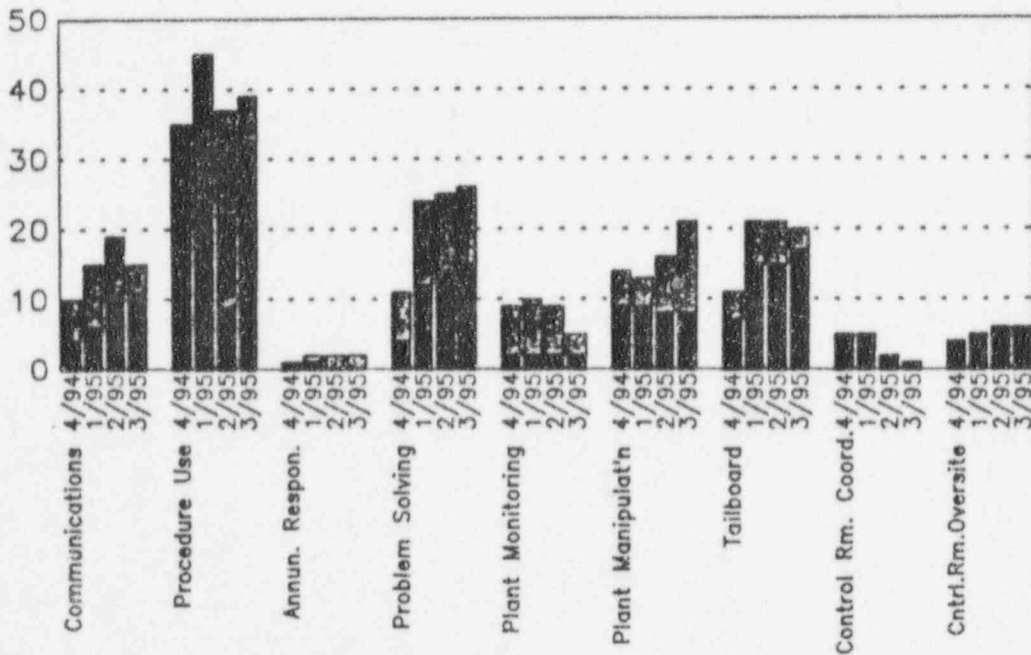
1985 accumulation
9503

OPERATIONS

Operational Events GOP Impact



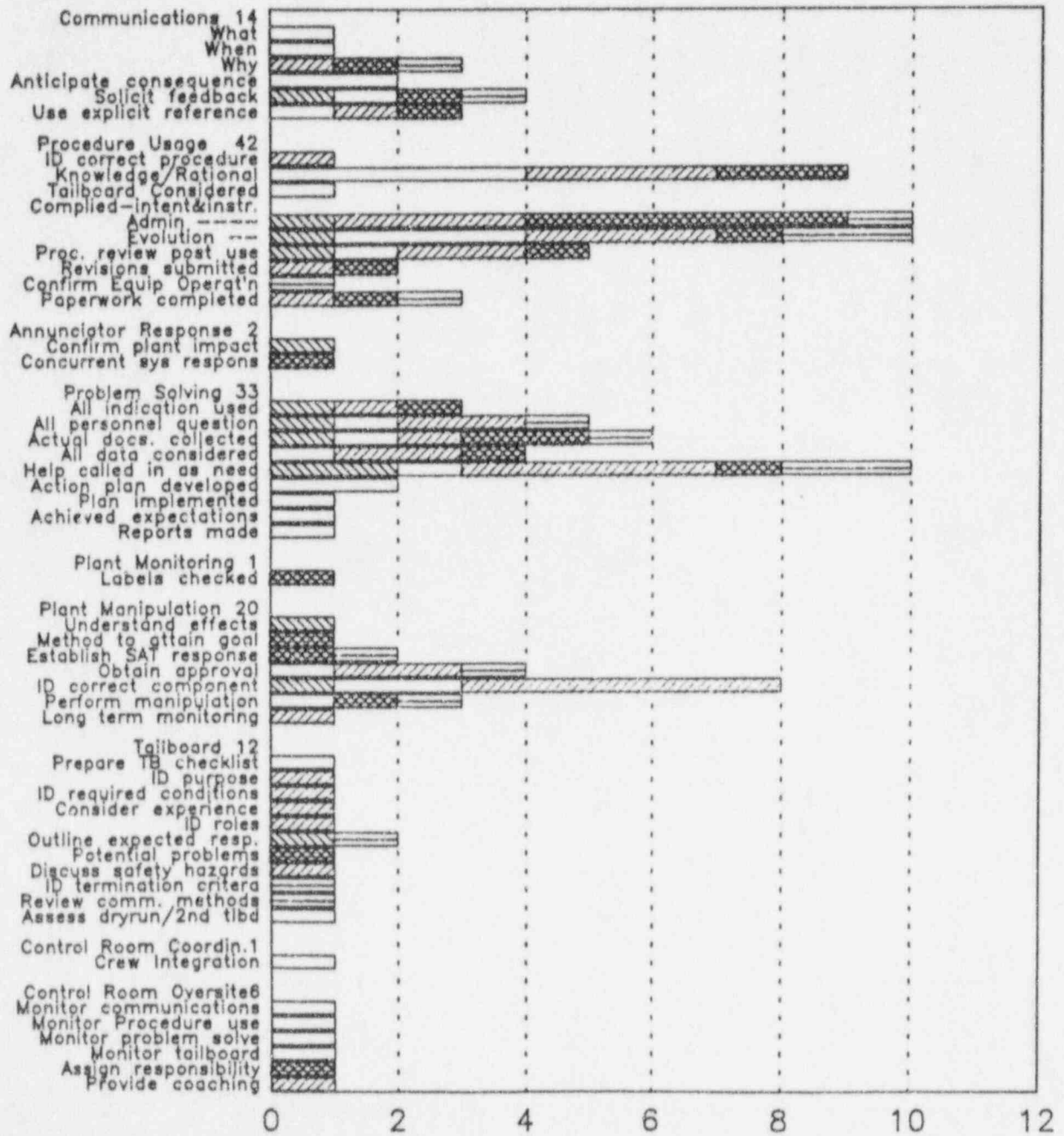
1995 accumulation by Quarter



12 Month Running

OPERATIONAL EVENTS

Composite of GOP Guidelines Impactec



Crew A
 Crew B
 Crew C
 Crew D
 Crew E

Running 12 Months

95Q3

gopcrx3!

HUMAN PERFORMANCE

Actions Taken Prior To U3C8 Refueling Outage

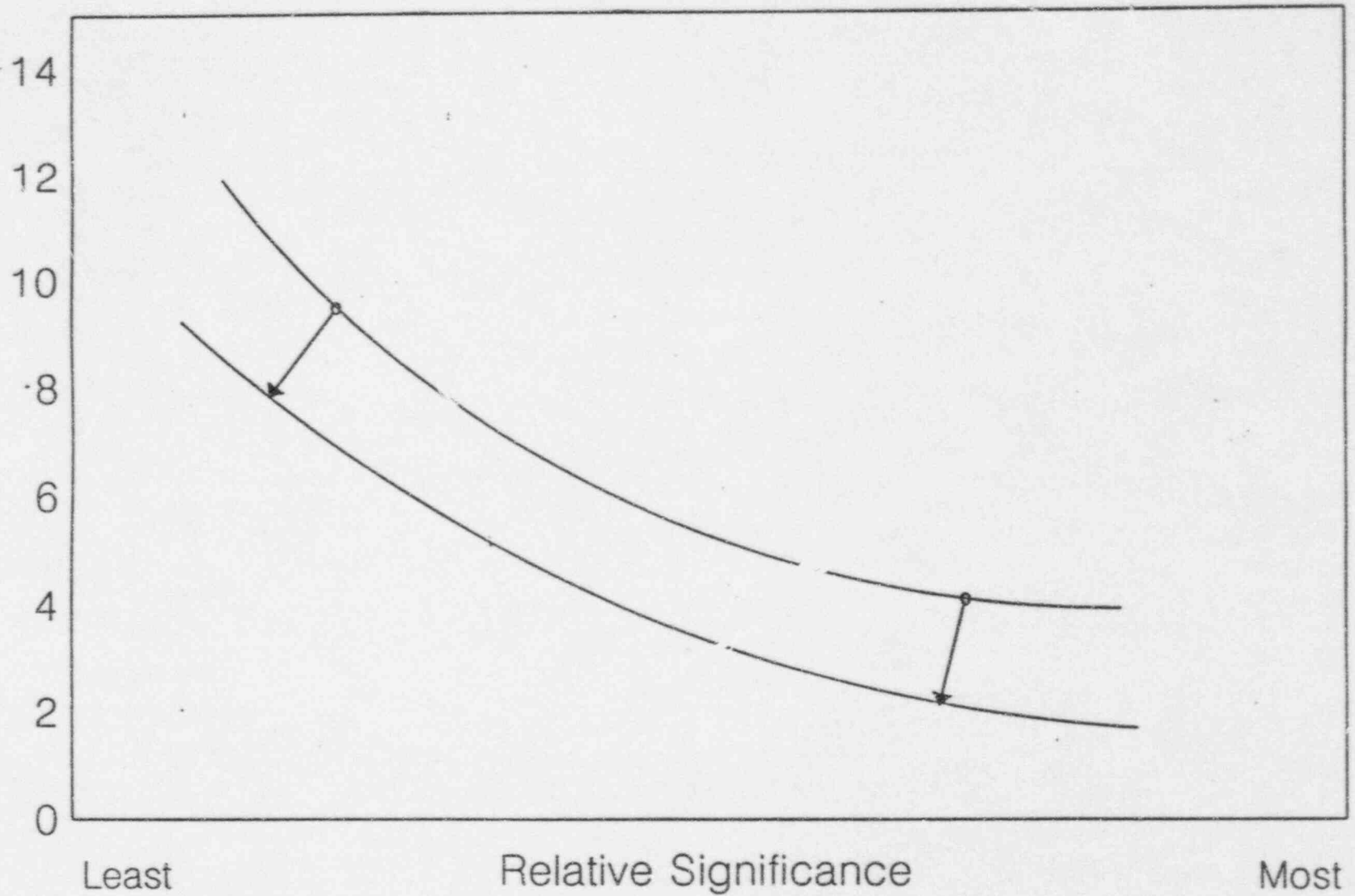
- Stand Down Meetings
- Management Monitoring of Control Room Activities
- Reduced Control Room Distractions
- Reemphasis of Supervisors' Role in Enforcing the GOPs
- Communications Standard
- Annunciator Response Standard
- Cross-Checking Expectation
- SS Stationed in the Control Room
- Most Experienced Operators on Outage Unit
- Detailed Outage Training
- EC/OPG Support in Control Room
- Clarification of 'Chain of Command'
- Crew Balancing

Future Actions

- SRO Visits to Other Plants
- Additional Crew Balancing
- Performance Training for Supervisors
- Observable Standards for the GOPs
- Position Specific Performance Expectations
- Additional Reduction in Control Room Distractions
- Enhancements to System Venting Techniques
- Qualify All Operators on Primary Systems
- Improved Supervisory Monitoring Forms Which Provide Objective Criteria for GOP Implementation and Supervisory Skills

Operations Units 2 & 3

Refueling Period Events



RELATIVE SIGNIFICANT SCALE

Actual Transient of minor safety significance associated with:

- (22) Fuel
- (21) One fission product barrier
- (20) 10CFR20 limits
- (19) Personnel Injury
- (18) Environmental release
- (17) Equipment damage

Violation of some of the barriers to:

- (16) Fuel
- (15) One fission product barrier
- (14) 10CFR20 limits
- (13) Personnel injury
- (12) Environmental release
- (11) Equipment damage
- (10) Budget impact
- (9) Generation impact

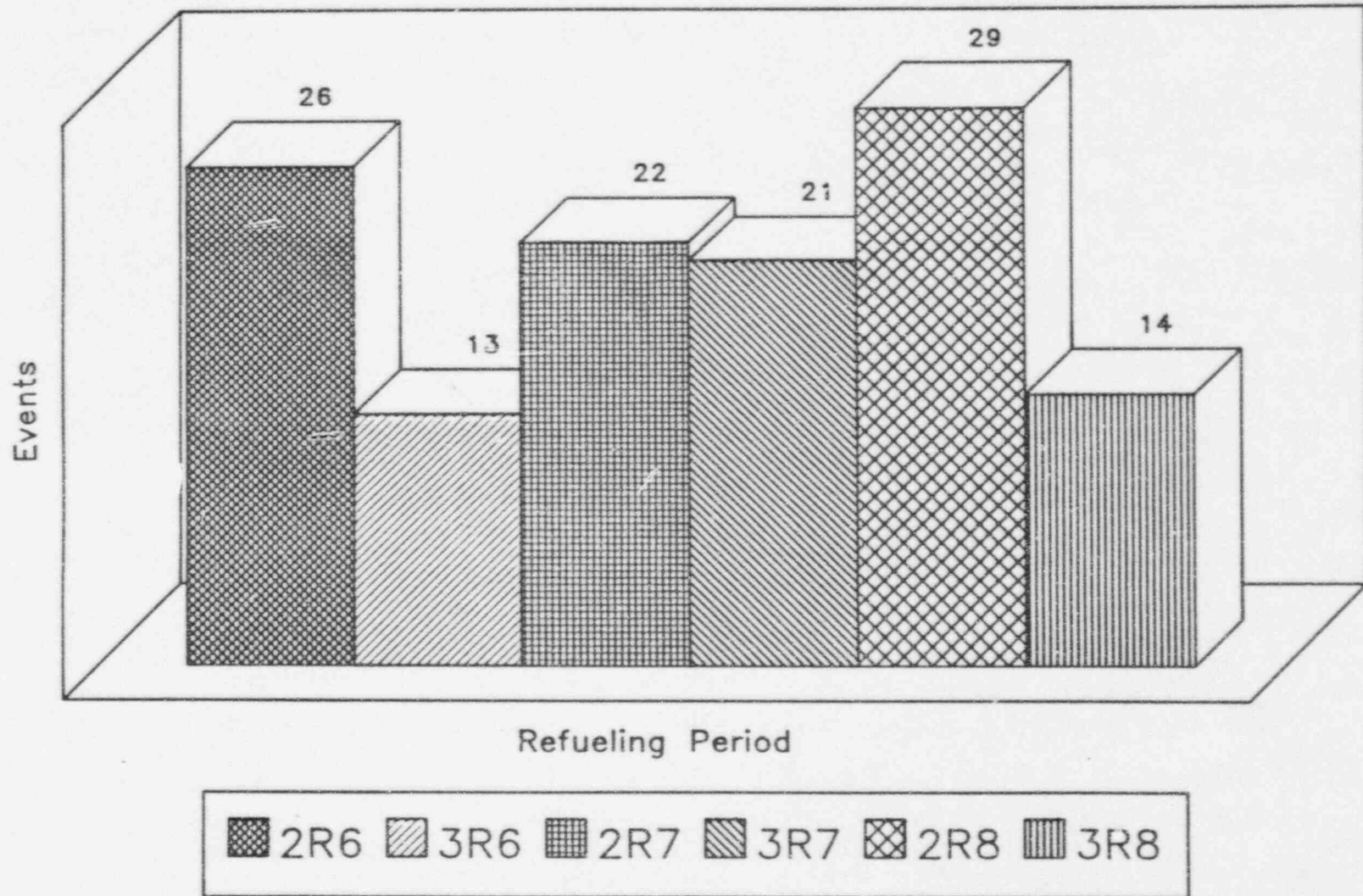
Violation of one barrier to:

- (8) Fuel
- (7) One Fission product barrier
- (6) 10CFR20 limits
- (5) Personnel injury
- (4) Environmental release
- (3) Equipment damage

- (2) Good operating practice or administrative error
- (1) Program corrected error

Operations Units 2 & 3

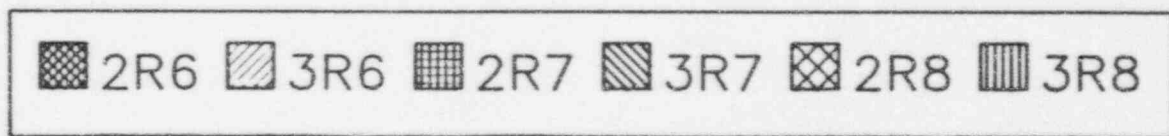
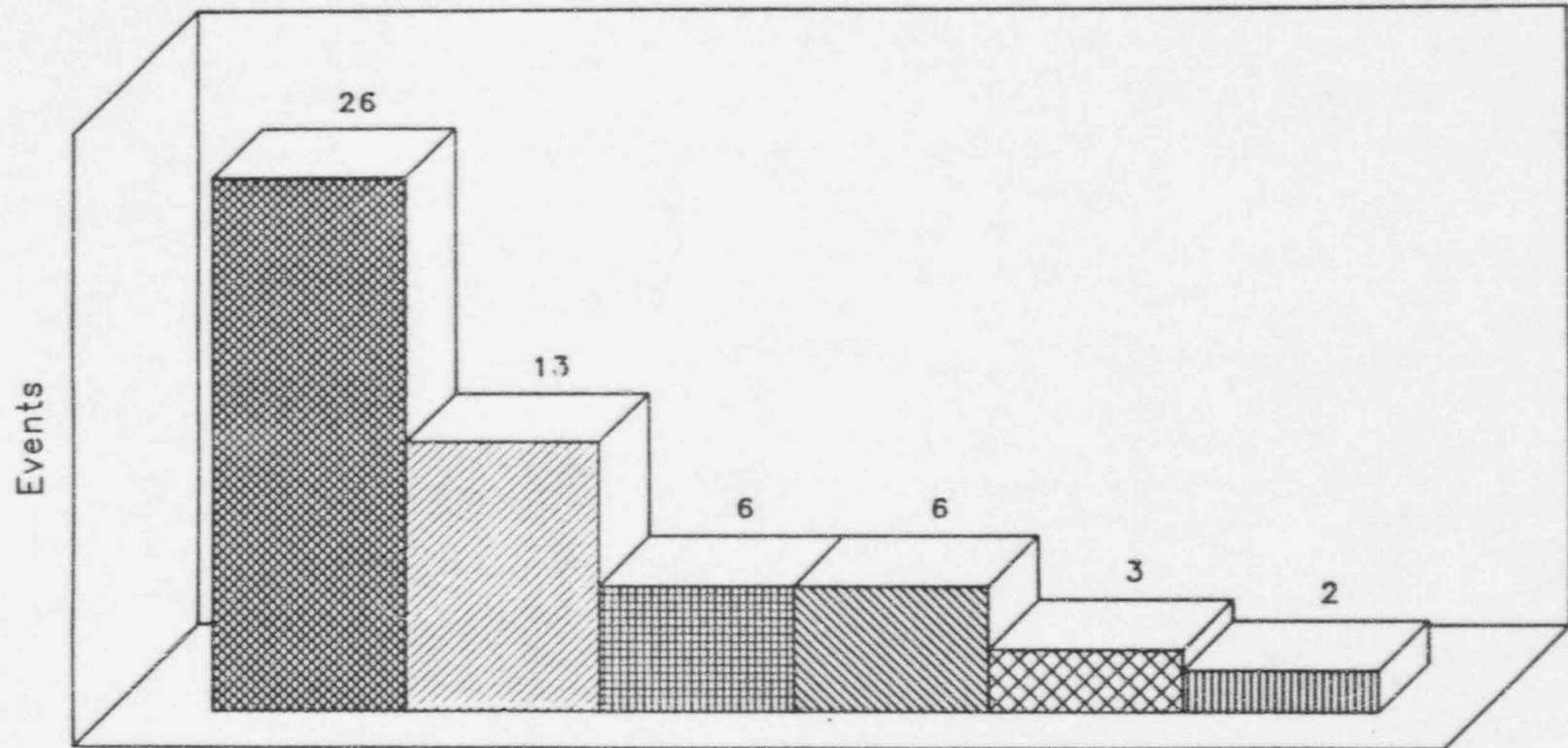
Refueling Period Events



Operations Units 2 & 3

Refueling Period Events

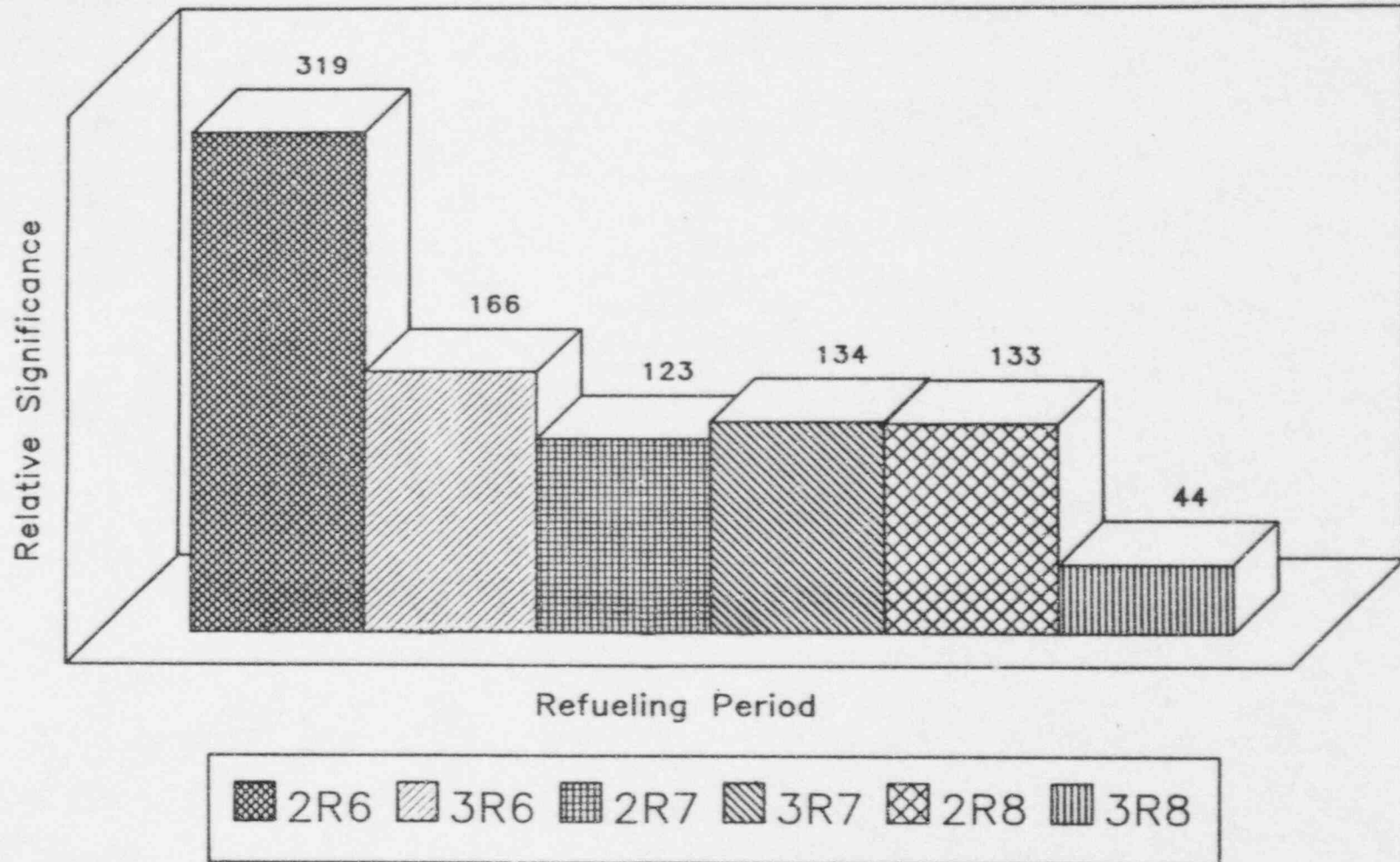
Relative significance $\geq 10/22$



Operations Units 2 & 3

Refueling Period Events

Sum of Relative significance

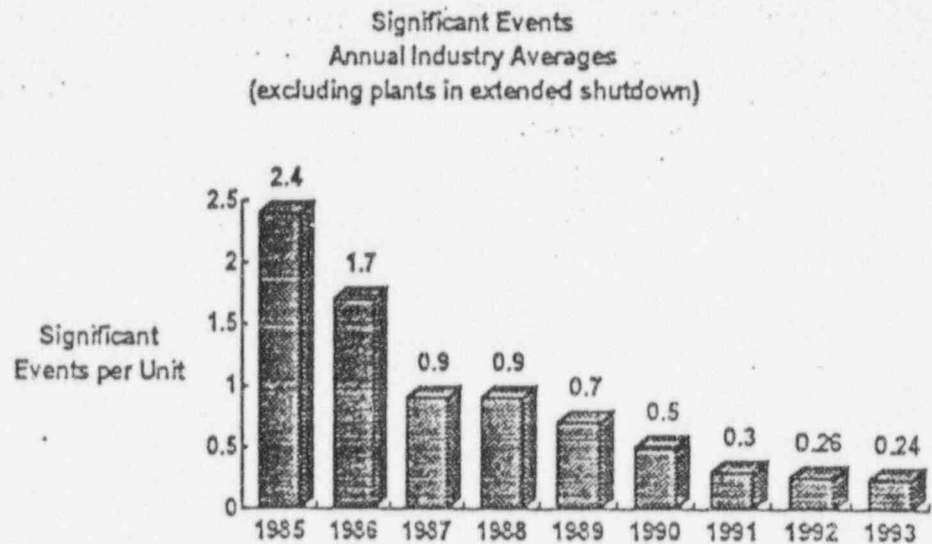


Synopsis

Need for Change

As Figure 1 shows, the number of significant events in the industry has declined dramatically since 1985. The progress made over the past decade on a variety of performance indicators also presents a positive trend. This trend could lead, in turn, to an incorrect conclusion that this level of progress is sufficient.

Figure 1

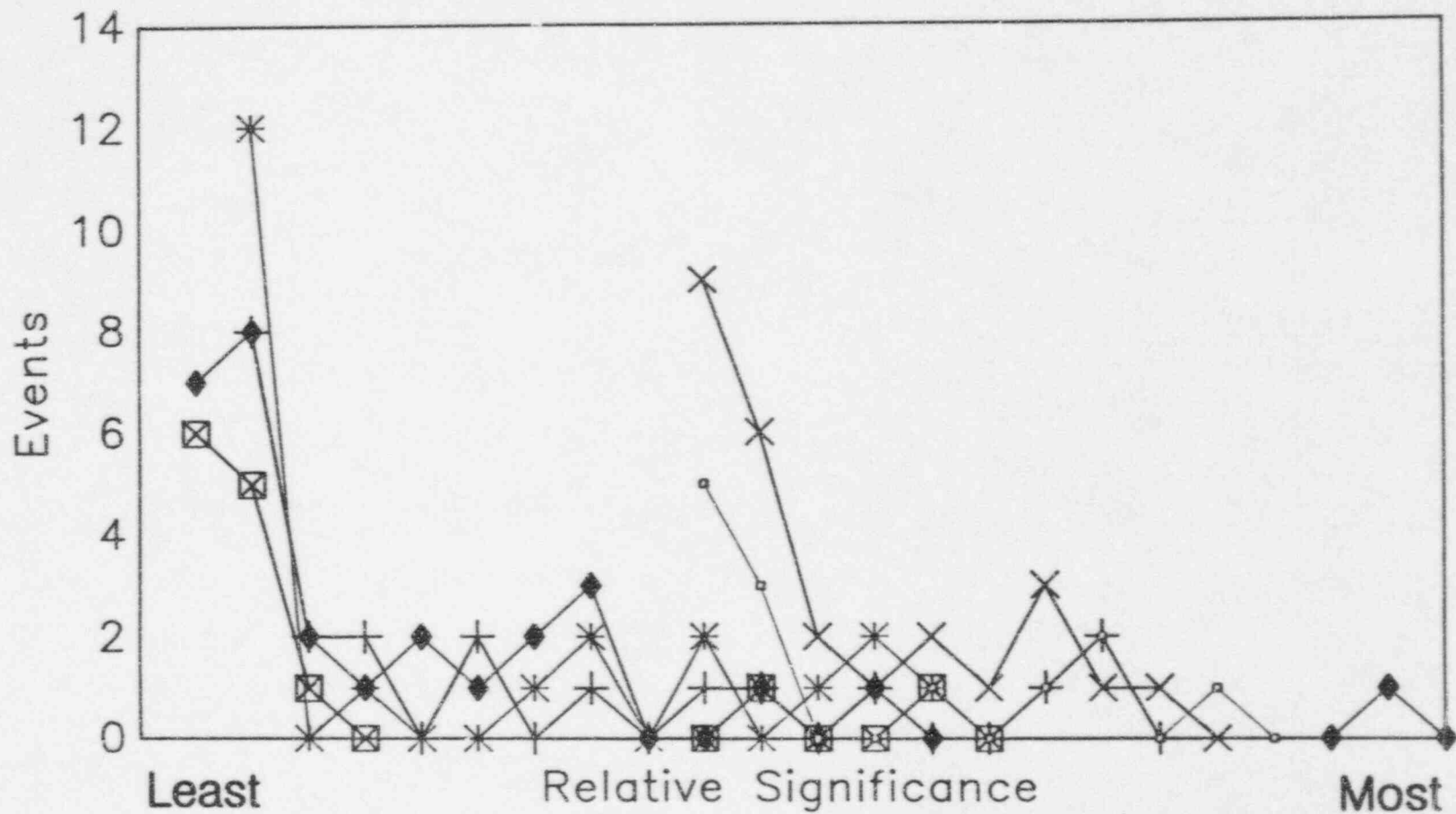


Source: U.S. Nuclear Regulatory
Commission, Office for Analysis
and Evaluation of Operational Data

Although representative of a positive trend, this figure does not tell the whole story. Troubling events continue to occur and a substantial proportion of event causes involve human error. Even though the industry has modified procedures, enhanced training, and improved equipment performance, the contribution of the human element has become more prominent. The key to continuing the industry's record of progress is to further improve the performance of its people at all levels.

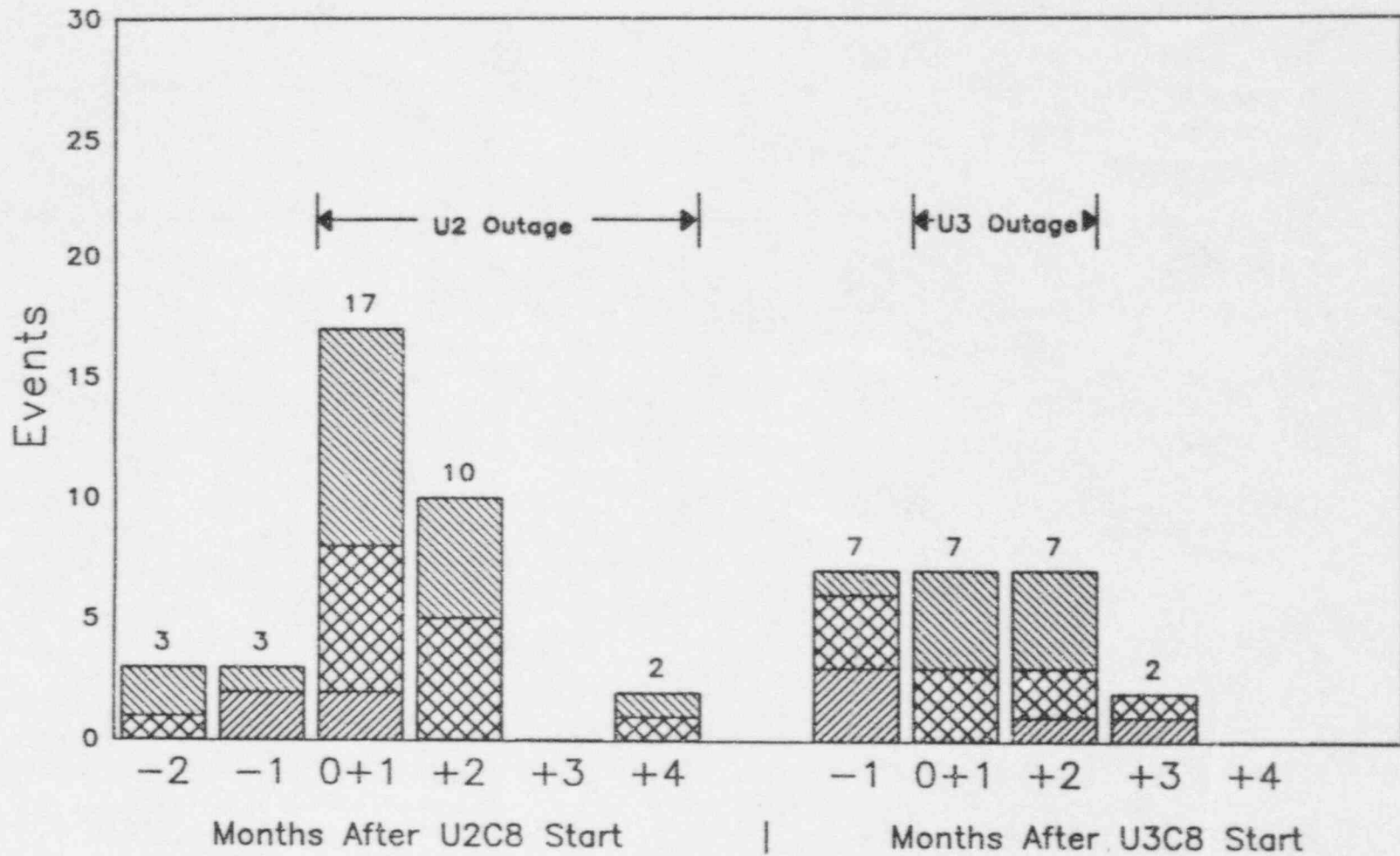
Operations Units 2 & 3

Refueling Period Events



* 2R6 □ 3R6 * 2R7 + 3R7 ◆ 2R8 ⊠ 3R8

Operations Units 2 & 3 Events



Challenge
 Near miss
 ODER

U2C8 2/11/95 to 5/23/95 (101 days)
 U3C8 7/22/95 to 9/26/95 (65 days)
 refvrm13-outage months-30.437 days

MANAGEMENT MONITORING SCORE CARD

CREW	MAY 1995	SEPT. 1995
A	2.7	2.7
B	2.7	3.1
C	2.6	3.0
D	1.8	3.2
E	3.3	3.1

(0-5 point scale with 5 being perfect)

QA OBSERVATIONS

All Negative Observations

10.5% U2C8

3.8% U3C8

Industry best practice 0 - 5 %

Significant Observations

6 % U2C8

1.5% U3C8

ISSUES

LINES OF AUTHORITY

PERFORMANCE EXPECTATIONS

FORMALITY

FUNDAMENTALS

COMMUNICATIONS

COORDINATION

*Safety Engineering
Command and Control Evaluation*

Ray Waldo
Manager, Operations

Command and Control Assessment

■ *Methodology*

- *Field Observations*
- *Interviews*
- *Analysis of Operations Events*
- *SALP 1 and INPO 1 plants benchmarked*

Results

- *Lines of authority for outage command structure not adequately described*
- *Performance expectations not always clear and concisely stated*
- *Different levels of formality exist*
- *Low expectations for fundamentals knowledge*
- *Communication standards not consistently implemented*
- *Coordination methods are not clearly communicated*

Actions Taken

■ *Lines of Authority*

- *Chain of command for outage specified*
- *Off-shift personnel coordinate their recommendations with the on-shift SRO*

■ *Performance Expectations*

- *Written expectations for each watchstation*

Actions Taken (cont.)

■ *Formality*

- *Control room access*
- *Communicate management expectations on annunciator response*

■ *Fundamentals*

- *Minimize use of temporary procedures*
- *Provide supplementary training on problem solving*

Actions Taken (cont.)

■ **Communications**

- **Require a single practice for all operators during both normal and abnormal operations**

Actions Taken (cont.)

■ **Coordination**

- *During the outage, modify pre-shift brief so that the on-coming SS summarizes priorities for the shift*
- *Ensure Auxiliary NPEOs receive a briefing prior to beginning shift activities*
- *Ensure each watchstander speaks at the turnover tailboard to provide operators an overall understanding of status*

Actions To be Taken

■ *Lines of Authority*

- *Develop outage chain of command organization chart developed*

■ *Performance Expectations*

- *Provide written expectations for each watch station*
- *Balance crew experience and styles as conditions change*

Actions to be Taken (cont.)

■ *Fundamentals*

- *Identify fundamental core competencies that support problems solving such as reading elementary drawings and pump curves. Integrate into requalification and simulator training*
- *Include system training in the requal programs*
- *Ensure NPEO's participate in simulator training*
- *Utilize NPEOs in the simulator booth as in-plant operators*
- *Consider qualifying operators for the next higher positions*

Actions to be Taken (cont.)

■ **Formality**

- Evaluate administrative processes that require persons to enter the control room and eliminate these duties