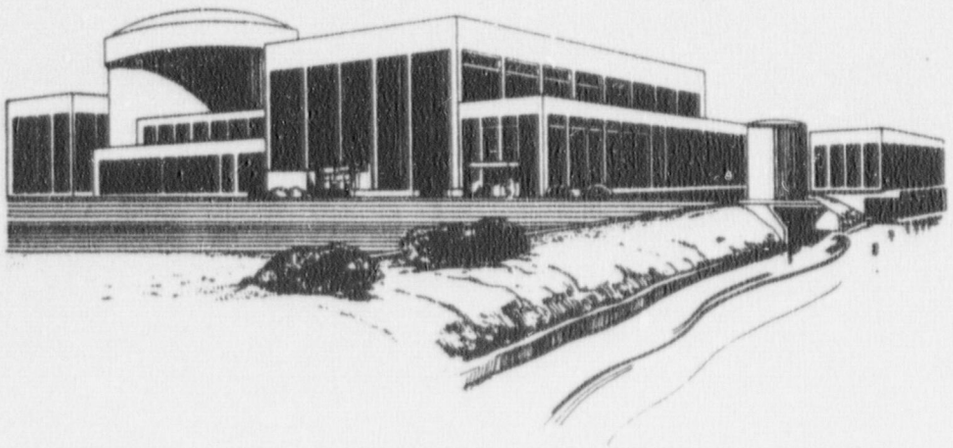
FORT CALHOUN STATION
PERFORMANCE INDICATORS

AUGUST, 1989



Prepared by:

Production Engineering Division
Special Services

OMAHA PUBLIC POWER DISTRICT

FORT CALHOUN STATION

PERFORMANCE INDICATORS

PREPARED BY:

PRODUCTION ENGINEERING DIVISION

SPECIAL SERVICES

AUGUST, 1989

TABLE OF CONTENTS

DISTRIBUTION

V. W. Anderson
R. L. Andrews
W. R. Bateman
K. L. Belek
A. D. Bilau
C. N. Bloyd
J. P. Bobba
C. J. Brunnert
M. W. Butt
R. H. Cagle
C. A. Carlson
G. S. Cary
J. W. Chase
G. R. Chatfield
A. G. Christensen
R. P. Clemens
R. G. Conner
J. L. Connolley
M. R. Core
G. M. Cook
P. J. Cotton
S. R. Crites
D. W. Dale
R. C. DeMeulmeester
W. D. Dermyer
R. D. DeYoung
D. C. Dietz
D. E. Dirrim
J. A. Drahota
M. O. Elzway
R. G. Eurich
H. J. Faulhaber
M. A. Ferdig
K. S. Fielding
J. J. Fluehr
J. J. Foley
F. F. Franco
M. T. Frans
J. F. W. Friedrichsen
R. M. Fussell
S. K. Gambhir
J. K. Gasper
W. G. Gates
M. O. Gautier
J. T. Gleason
L. V. Goldberg
R. E. Gray

PREFACE

PERFORMANCE INDICATORS
REPORT IMPROVEMENTS

A new paragraph has been added to each indicator for the month of August. These paragraphs (Adverse Trends) explain the conditions under which certain indicators are showing adverse trends. This addition to the Performance Indicators Report was a request made at the Nuclear Managers Meeting held on August 9, 1989.

One indicator has been added to the Fort Calhoun Station Performance Indicators Report in August. This new indicator is shown in the Chemistry and Radiological Protection Section.

The new Chemistry and Radiological Protection indicator is the Hazardous Waste Produced Indicator found on page 39. This indicator shows the amount of waste oil, non-halogenated hazardous waste, halogenated hazardous waste, and other hazardous waste produced by the Fort Calhoun Station for the reporting month.

One indicator has been changed for the month of August. This indicator is shown in the Chemistry and Radiological Protection Section.

The indicator that has been changed in the Chemistry and Radiological Protection Section is the In-Line Chemistry Instruments Out-of-Service Indicator found on page 38. This indicator now shows a Fort Calhoun goal of less than 3 in-line chemistry instruments that are out-of-service.

Four indicators in the Maintenance Section are in the process of being changed. These revisions include changing the current data sources and are expected to be completed for the September, 1989, Performance Indicators Report. The four indicators that are in the process of being changed include the Age of Outstanding Maintenance Work Orders Indicator found on page 23, the Maintenance Work Order Breakdown Indicator found on page 24, the Corrective Maintenance Backlog >3 Months Old Indicator found on page 25, and the Ratio of Highest Priority MWO's to Total MWO's Completed Indicator found on page 26.

PURPOSE

This program titled "Performance Indicators" is intended to provide selected Fort Calhoun plant performance information to OPPD's personnel responsible for optimizing unit performance. The information is presented in a way that provides ready identification of trends and a means to track progress toward reaching corporate goals. The information can be used for assessing and monitoring Fort Calhoun's plant performance, with emphasis on safety and reliability. Some performance indicators show company goals or industry information. This information can be used for comparison or as a means of promoting pride and motivation.

SCOPE

In order for the Performance Indicator Program to be effective, the following guidelines were followed while implementing this program:

Select the data which most effectively monitors Fort Calhoun's performance in key areas.

Present the data in a straight forward graphical format using averaging and smoothing techniques.

Include established corporate goals and industry information for comparison.

Develop formal definitions for each performance parameter. This will ensure consistency in future reports and allow comparison with industry averages where appropriate.

Comments and input are encouraged to ensure that this program is tailored to address the areas which are most meaningful to the people using the report.

PERFORMANCE INDICATORS
INDEX TO GRAPHS

INDUSTRY KEY PARAMETERS

PERFORMANCE INDICATORS
INDEX TO GRAPHS
(CONTINUED)

OPERATIONS

MAINTENANCE

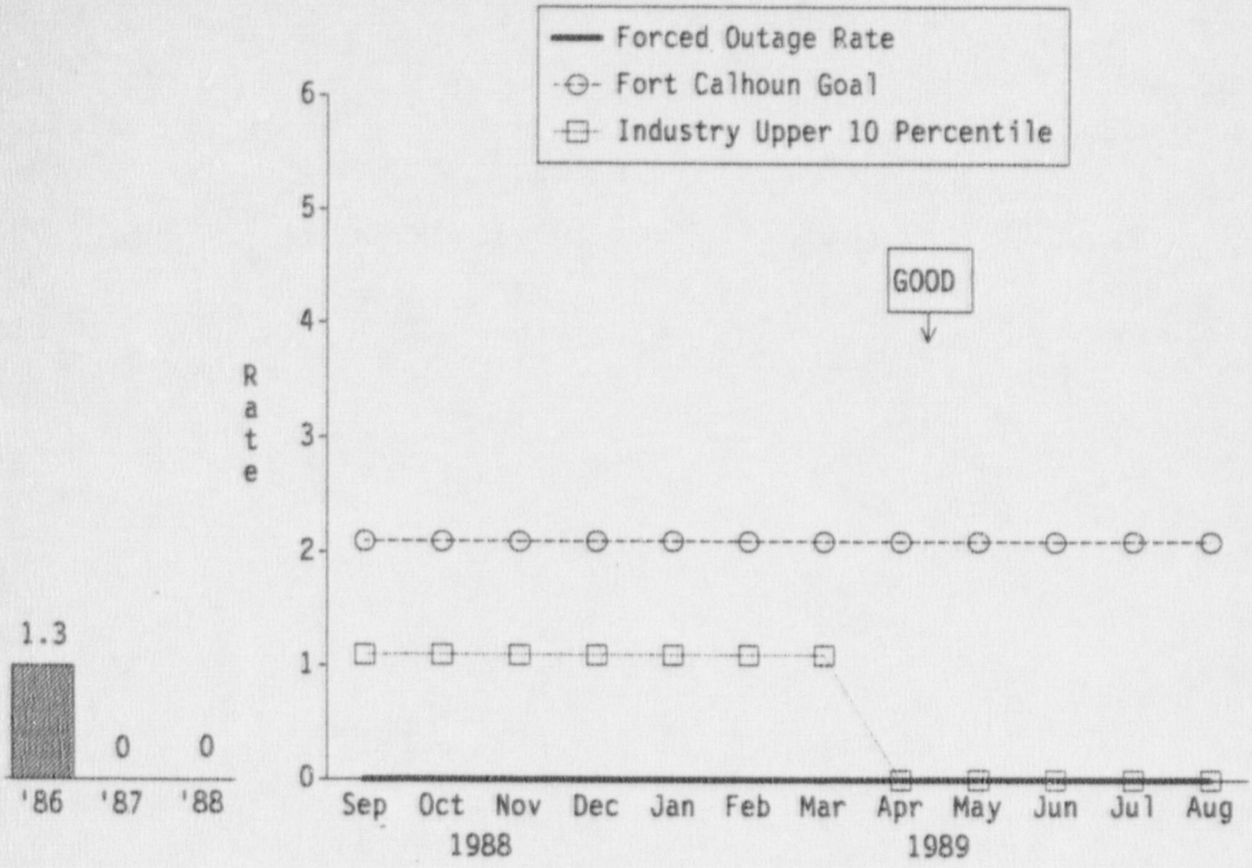
PERFORMANCE INDICATORS
INDEX TO GRAPHS
(CONTINUED)

MAINTENANCE (CONTINUED)

CHEMISTRY AND RADIOLOGICAL PROTECTION

MATERIALS AND OUTSIDE SERVICES

PERFORMANCE INDICATORS
INDEX TO GRAPHS
(CONTINUED)



FORCED OUTAGE RATE

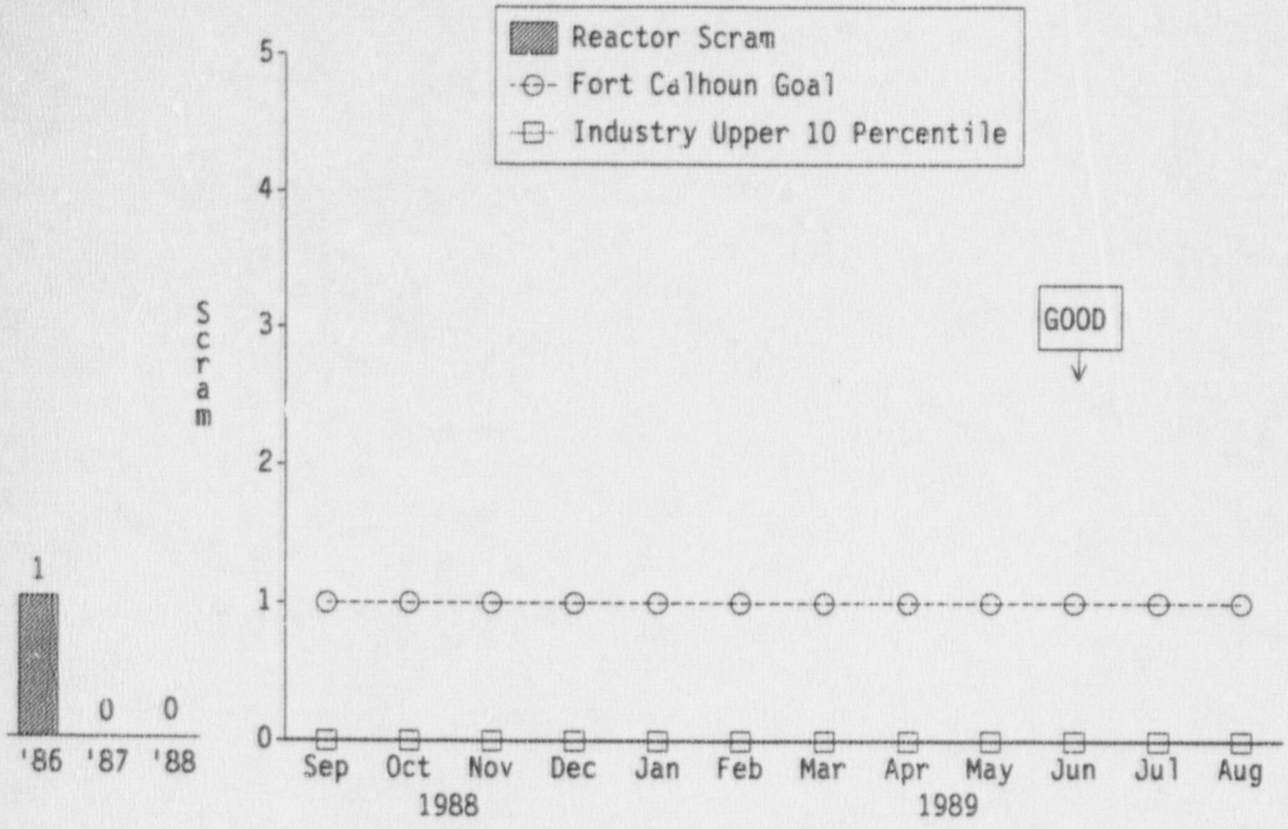
No forced outage hours were logged for the Fort Calhoun Station during August, 1989. The present 12 month average forced outage rate is 0.0%.

The last forced outage at Fort Calhoun occurred three years ago in August of 1986.

The industry upper ten percentile value for the forced outage rate is 0.0%. The Fort Calhoun Station is currently in the upper ten percentile of nuclear plant performance in this area.

The 1989 goal for forced outage rate is 2.1% and is based on seven days of forced outage time. The basis for establishing the 1989 performance goals can be found on page 78.

Adverse Trend: None



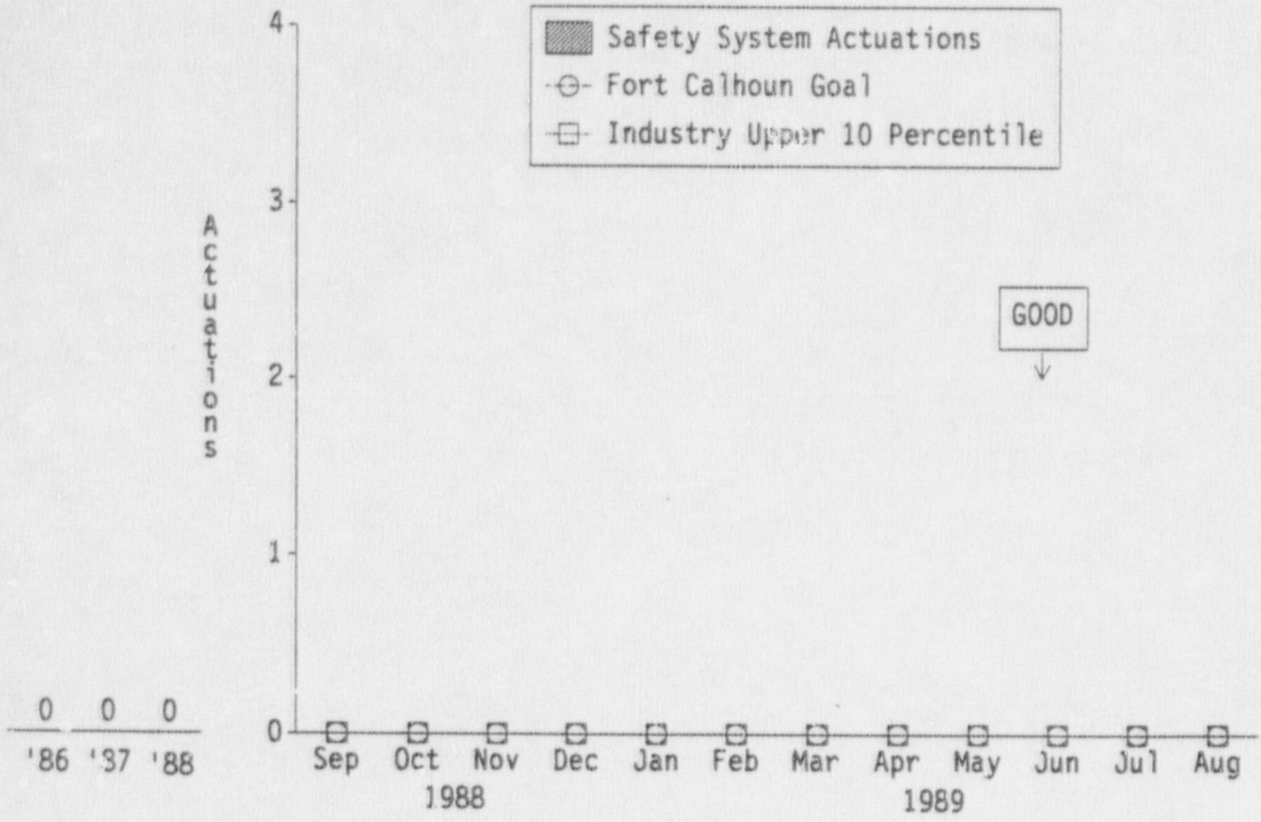
UNPLANNED AUTOMATIC REACTOR SCRAMS
WHILE CRITICAL

There were no unplanned automatic reactor scrams in August. It has been 1,156 days since the last unplanned automatic reactor scram which occurred on July 2, 1986.

The 1989 goal for unplanned automatic reactor scrams while critical has been set at 1.

The industry upper ten percentile value is zero scrams per unit on an annual basis. The Fort Calhoun Station is currently in the upper ten percentile of nuclear plant performance in this area.

Adverse Trend: None



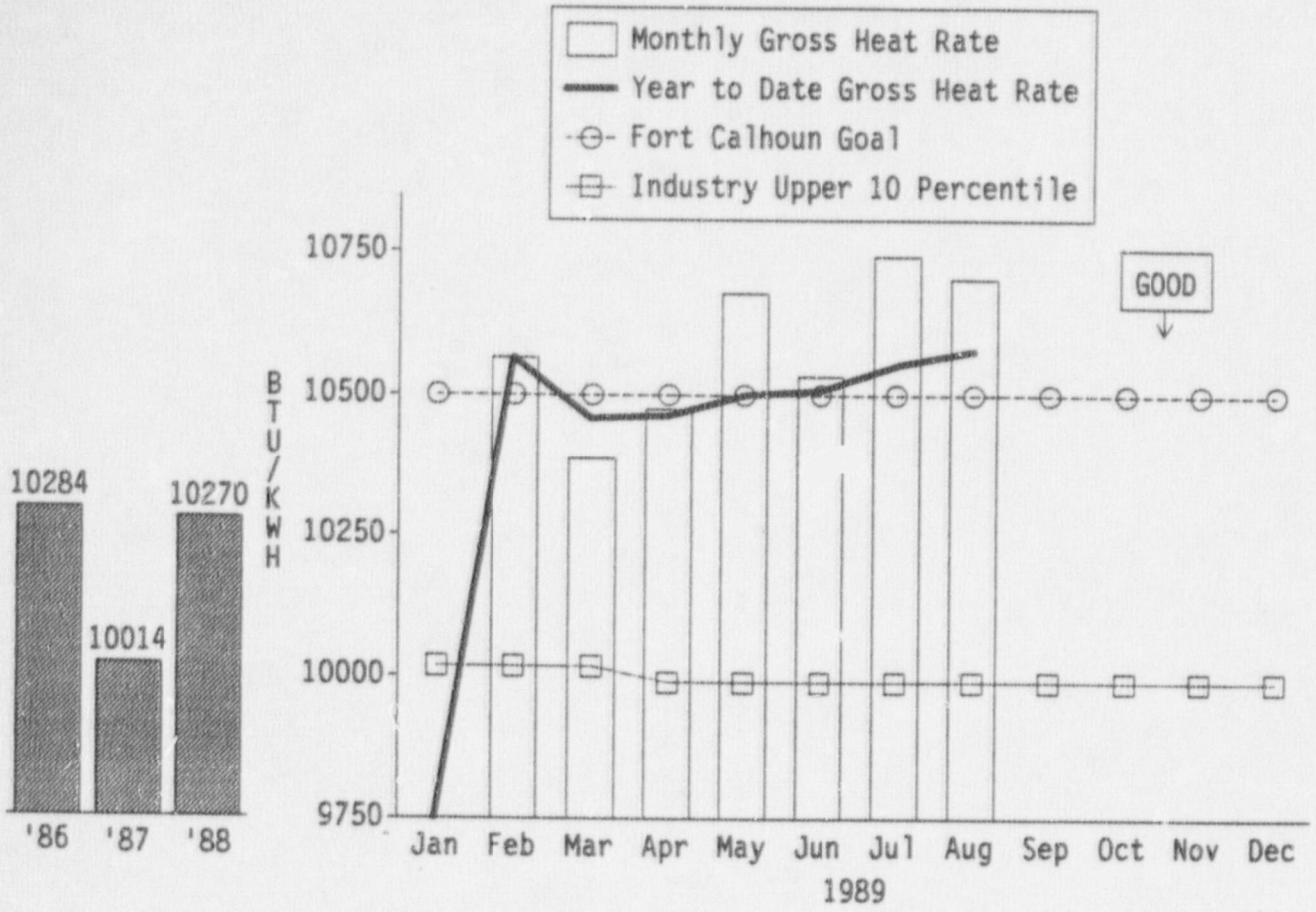
UNPLANNED SAFETY SYSTEM ACTUATIONS

There were no unplanned safety system actuations in August, 1989.

The 1989 goal for the number of unplanned safety system actuations is zero. This goal is based on past performance at the Fort Calhoun Station.

The industry upper ten percentile value for the number of unplanned safety system actuations per year is zero. The Fort Calhoun Station is currently in the upper ten percentile of nuclear plants for this indicator.

Adverse Trend: None



GROSS HEAT RATE

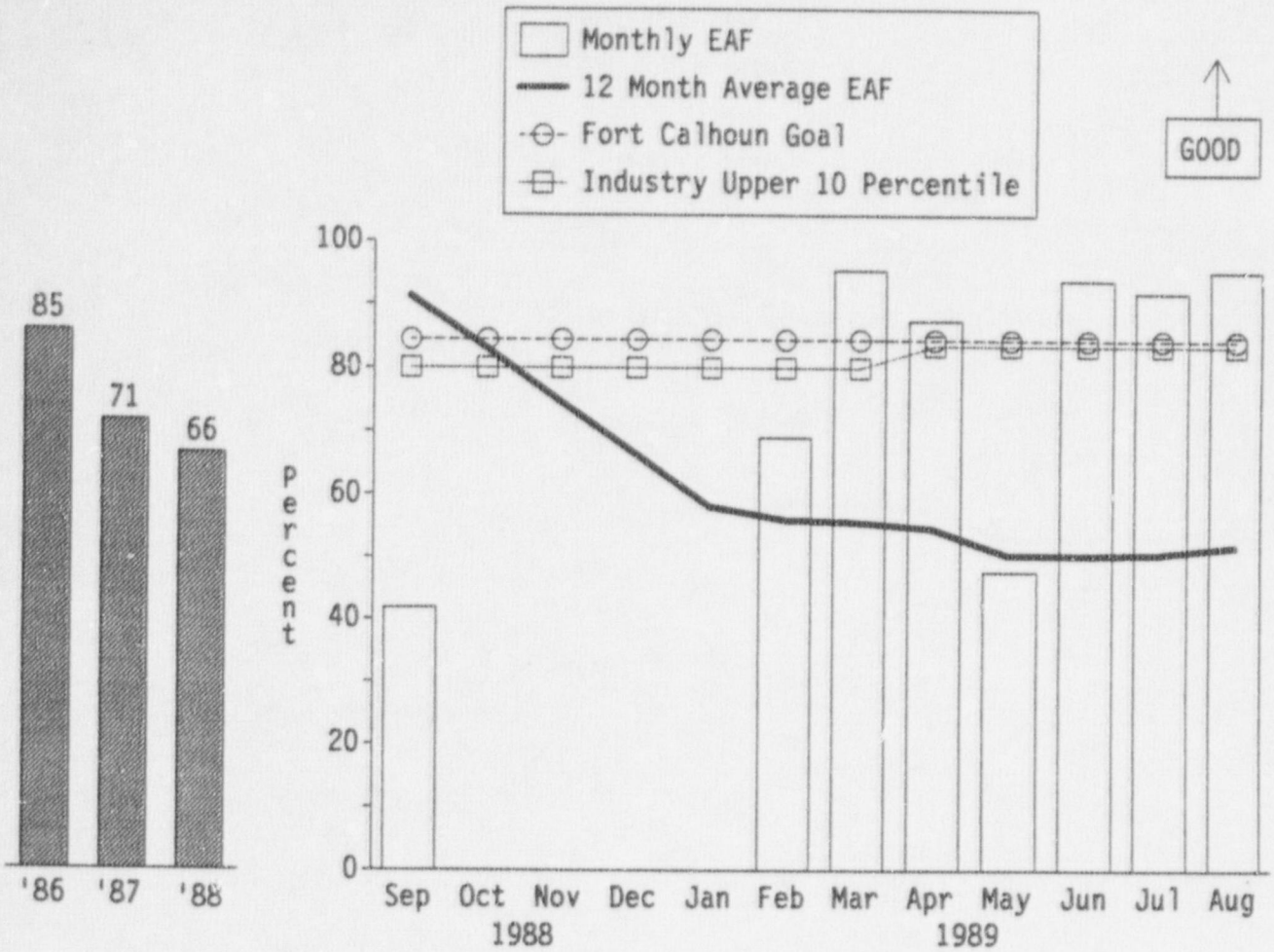
The gross heat rate for the Fort Calhoun Station during August, 1989 was 10,703 BTU/KWH.

The gross heat rate values for this cycle of operation will be increased due to the removal of the first stage of the high pressure turbine.

The 1989 year to date gross heat rate value is 10,577 BTU/KWH. The 1989 goal is 10,500 BTU/KWH. This goal value of 10,500 BTU/KWH is the theoretical best heat rate that the Fort Calhoun Station can obtain in its present configuration.

The gross heat rate industry upper ten percentile value is 9,989 BTU/KWH.

Adverse Trends: The monthly gross heat rate and the year to date heat rate have been increasing since June. These increases in the gross heat rate values are due to high river water temperatures which are affected by summer weather conditions.



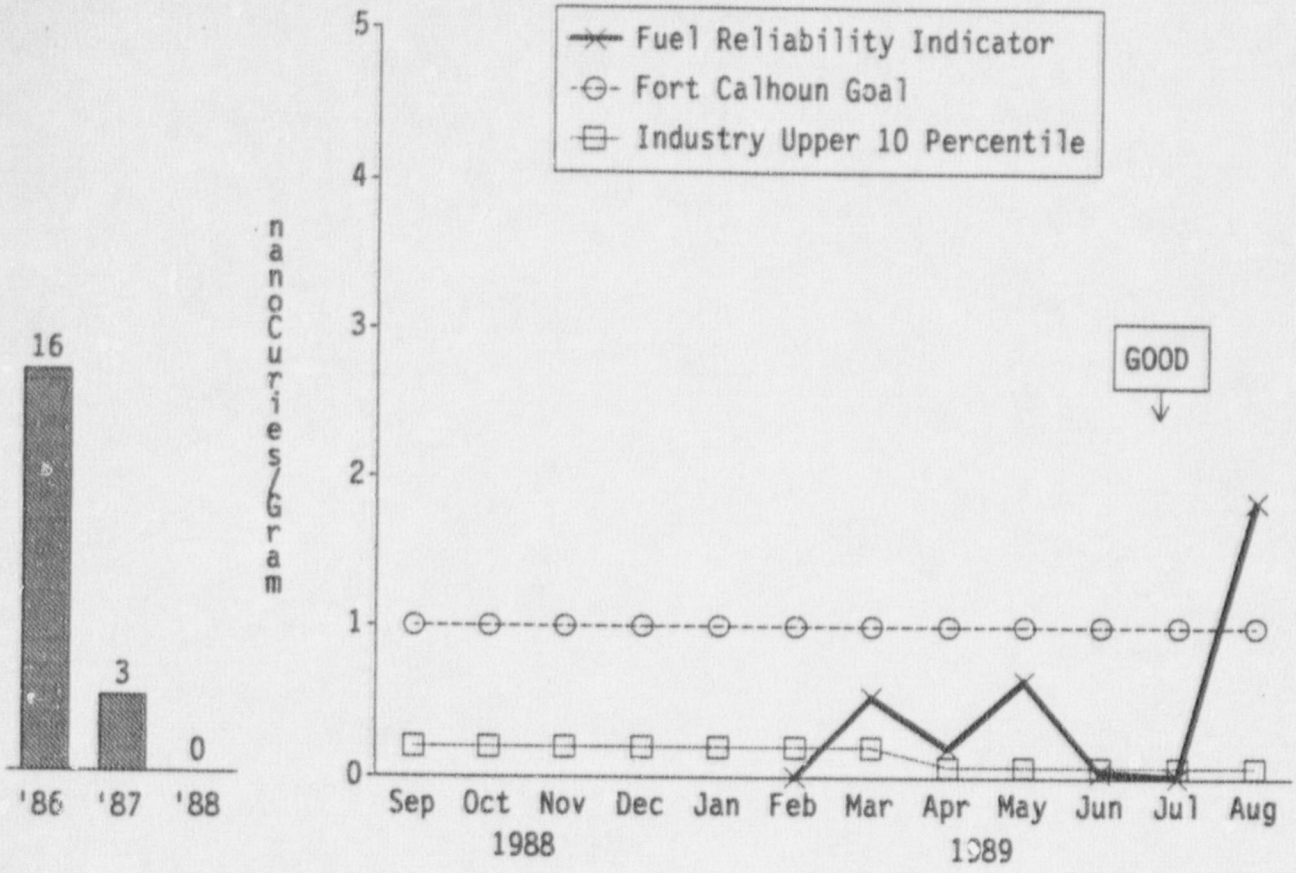
EQUIVALENT AVAILABILITY FACTOR

The Equivalent Availability Factor (EAF) was reported as 95.3% for the month of August.

The 1989 EAF goal is 84.4% while the present 12 month average EAF for Fort Calhoun is 51.9%.

The EAF industry upper ten percentile value is 83.5%.

Adverse Trends: The decline in the 12 month average EAF is due to the unavailability of the Fort Calhoun Station during the 1988 Refueling Outage and the maintenance outage that occurred in April and May of 1989. The 12 month average EAF is cyclic and will respond to refueling and maintenance outages.



FUEL RELIABILITY INDICATOR

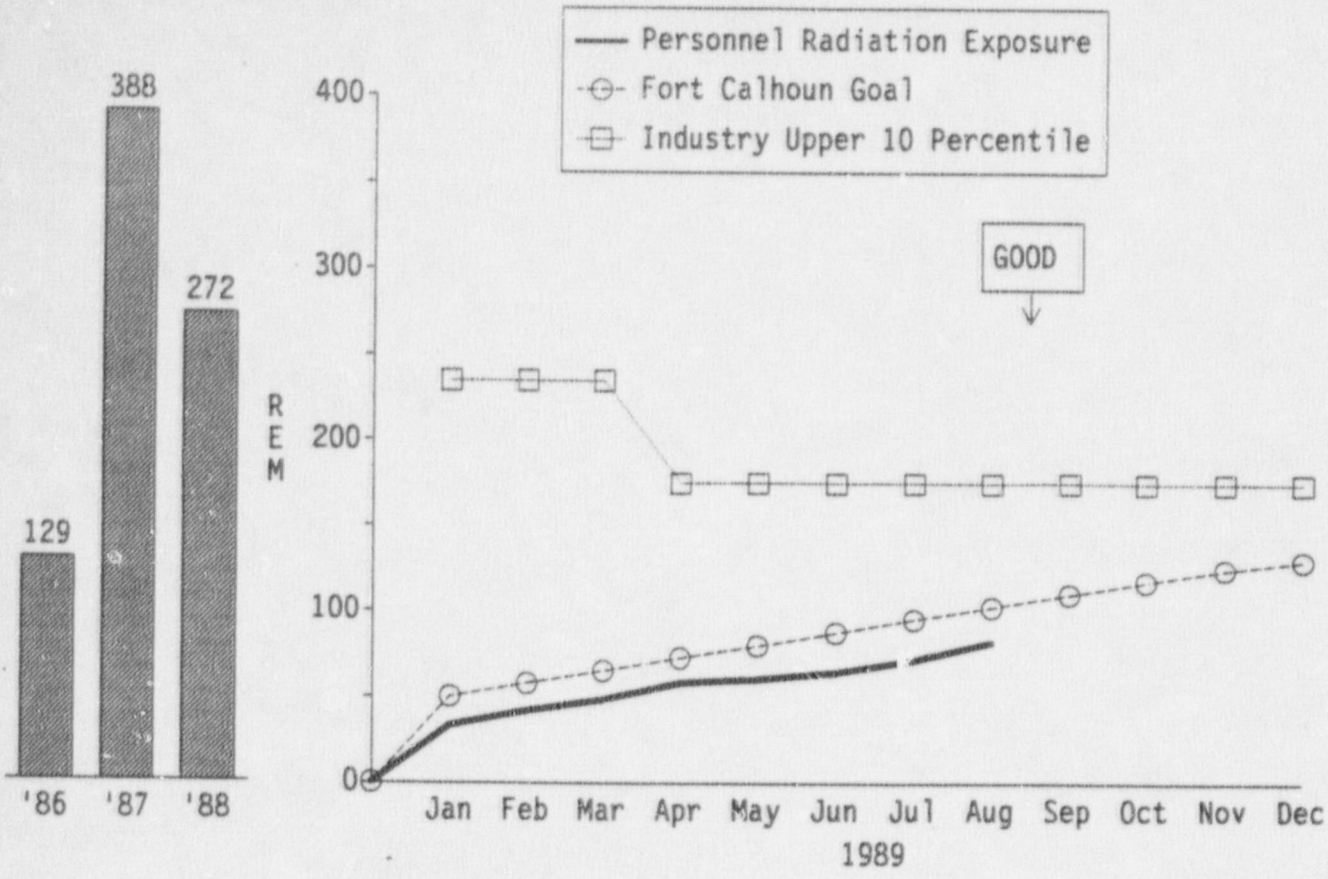
The Fuel Reliability Indicator (FRI) was reported as 1.85 nanocuries/gram for the month of August. Even though the FRI value for August is above the Fort Calhoun Goal, this FRI value indicates that there have been no fuel failures since startup in January, 1989.

The higher than normal FRI figures resulted from a change in the way that the FRI is calculated. The FRI was previously calculated using a constant letdown flow rate for the entire month, but the actual letdown flow rate is now used.

The 1989 fuel reliability goal has been set at 1.0 nanocuries/gram.

The fuel reliability indicator industry upper ten percentile value is 0.07 nanocuries/gram.

Adverse Trend: None



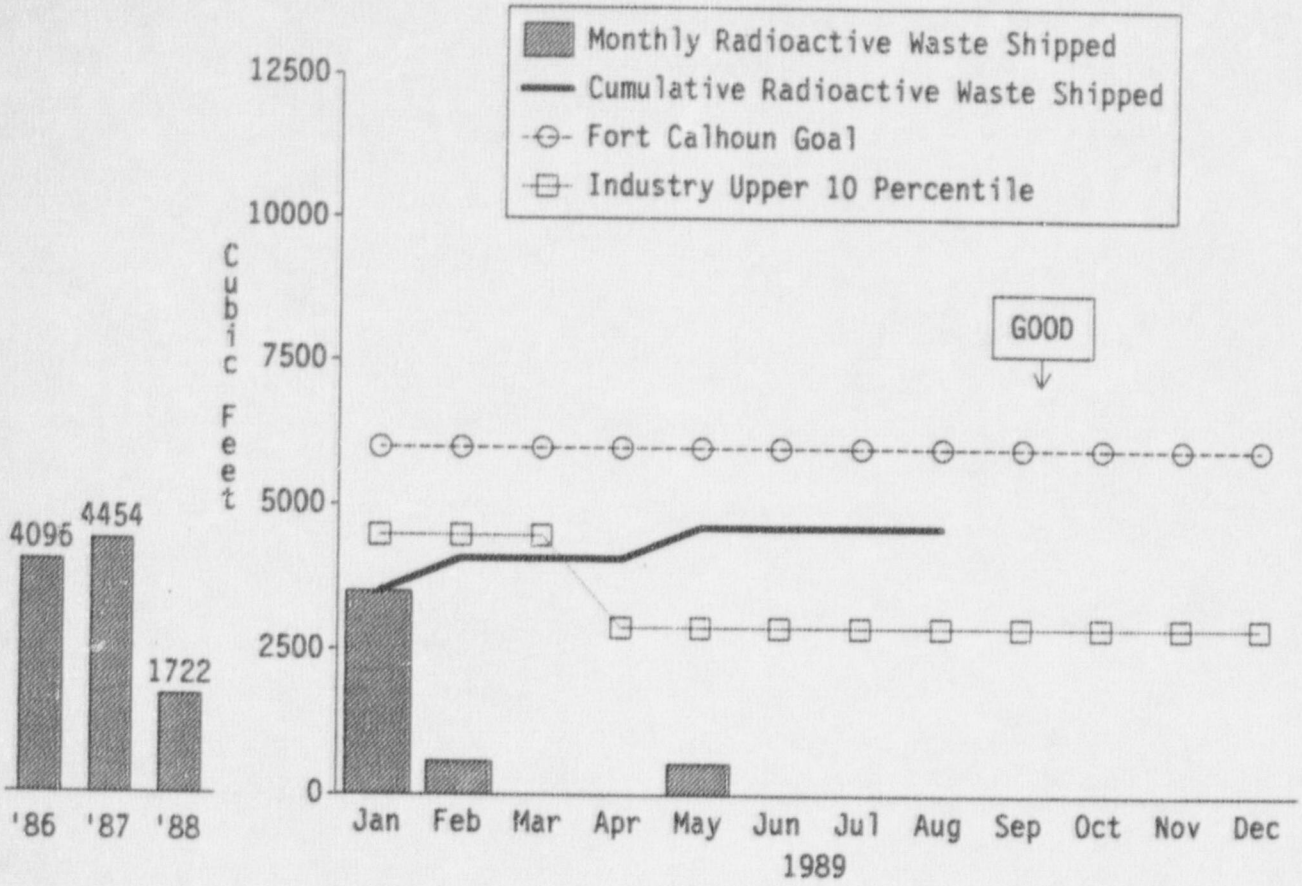
PERSONNEL RADIATION EXPOSURE
(CUMULATIVE)

During August, 1989, 10.8 man-rem was recorded by pencil dosimeters worn by personnel while working at the Fort Calhoun Station.

The monthly cumulative exposure goal for July was 95.0 man-rem while the actual recorded exposure through July was 71.0 man-rem.

The personnel radiation exposure industry upper ten percentile is 175 man-rem per unit per year.

Adverse Trend: None



VOLUME OF LOW-LEVEL SOLID RADIOACTIVE WASTE

The above graph shows the amount of low-level radioactive waste shipped off-site for disposal. The table below lists the amount of waste actually shipped off-site for disposal plus the change in inventory of waste in on-site storage in final form ready for burial.

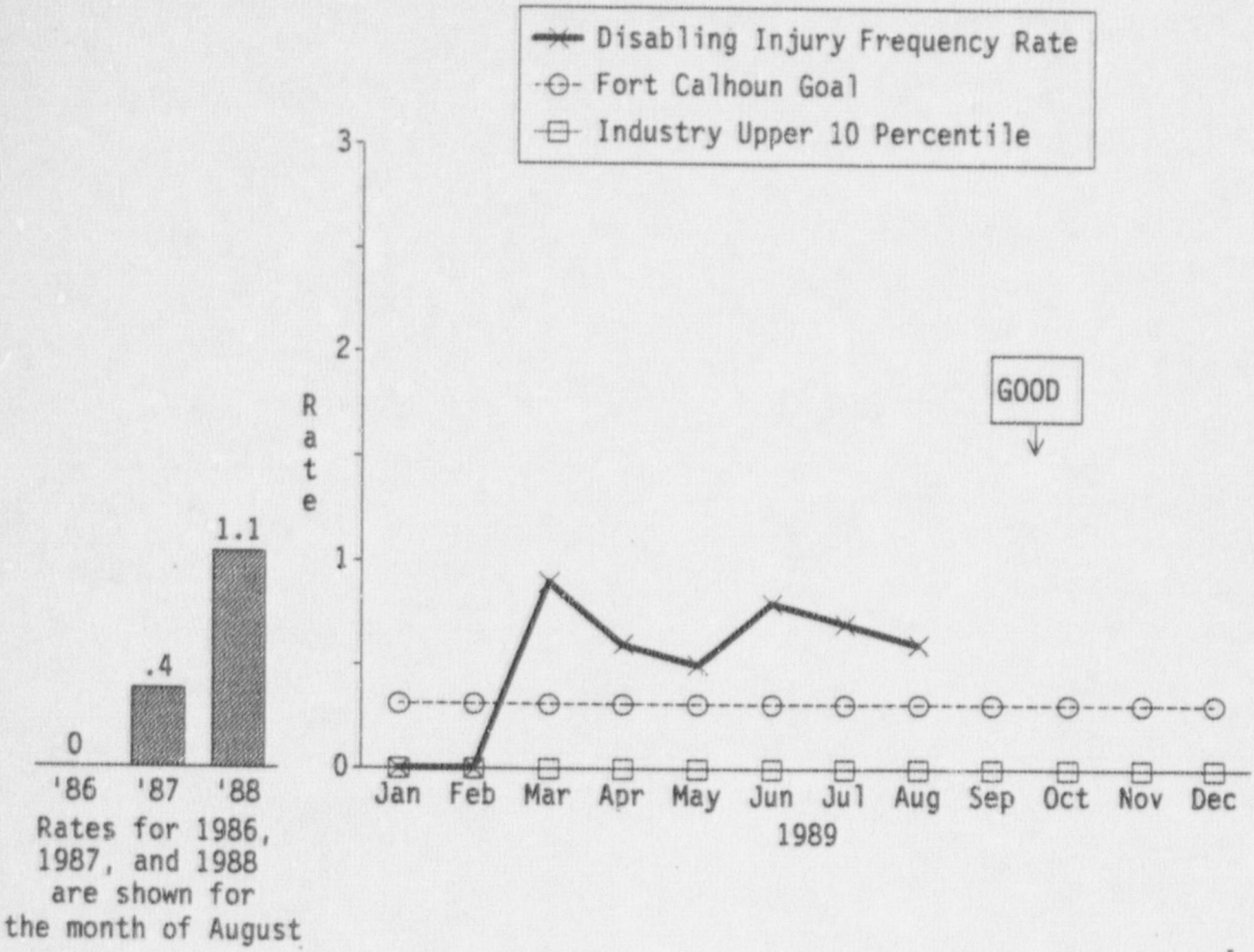
The volume of solid radioactive waste is (cubic feet):

Amount Shipped in August	-	0.0
Amount in Temporary Storage	-	729.0
1989 Cumulative Amount Shipped	-	4624.0
1989 Goal	-	6000.0

There are two reasons for the very high amount of low-level solid radioactive waste that was shipped in January, 1989. One reason is that the 1988 refueling outage produced a large volume of radioactive waste. Also, shipping of low-level solid radioactive waste stopped in October, 1988, due to samples being sent off-site for isotope analysis that could not be completed at the Fort Calhoun Station.

The industry upper ten percentile value is 2,895.5 cubic feet per unit per year. The Fort Calhoun Station was in the upper ten percentile of nuclear plants for this indicator in 1986, 1987 and 1988.

Adverse Trend: None



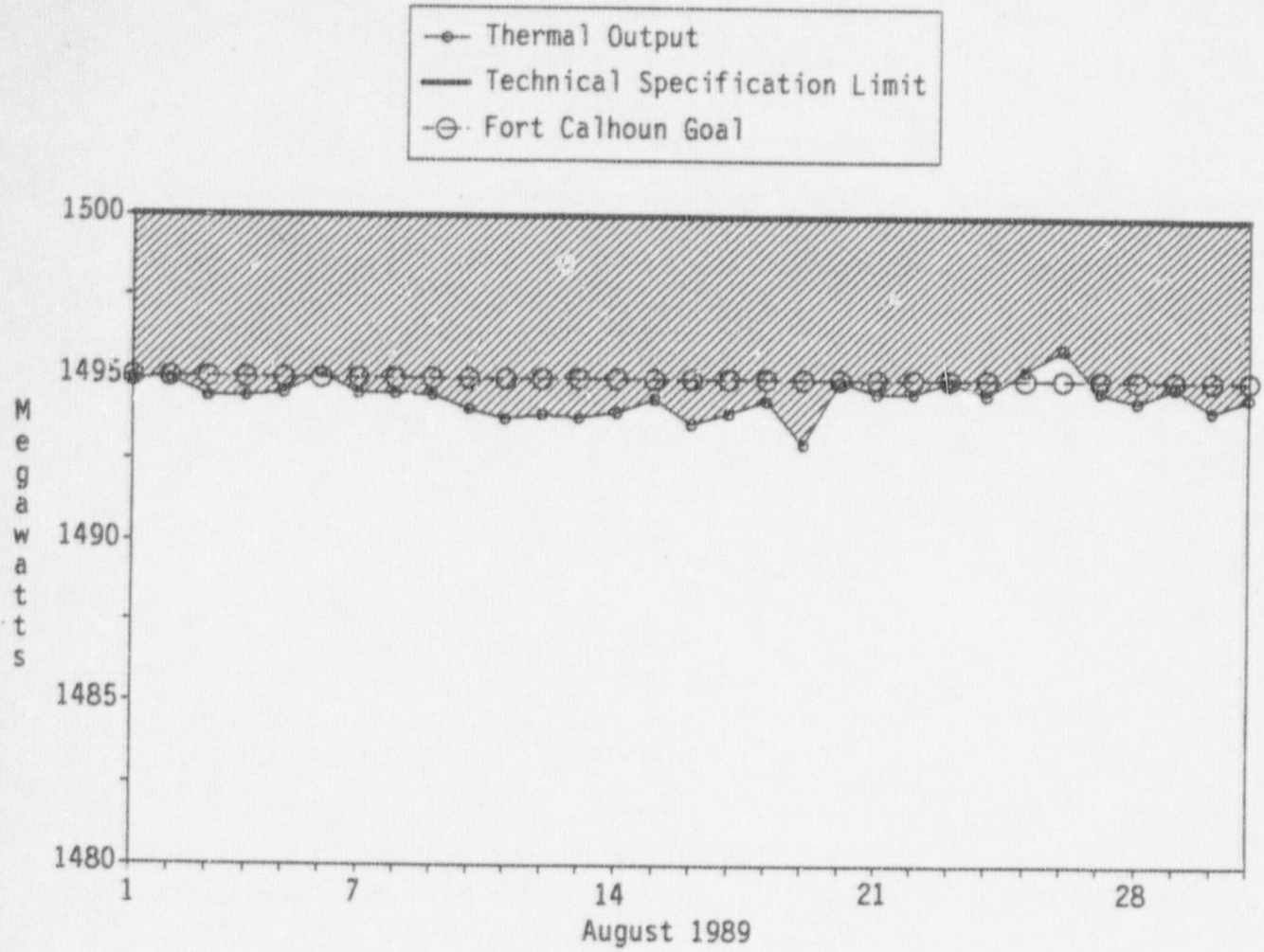
DISABLING INJURY FREQUENCY RATE
(LOST TIME ACCIDENT RATE)

There were zero disabling injuries reported at the Fort Calhoun Station in August. The total number of disabling injuries in 1989 is two.

The 1989 disabling injury frequency rate goal was set at 0.31% and was based on one disabling injury occurring in 1989.

The industry upper ten percentile disabling injury frequency rate is 0%.

Adverse Trend: None

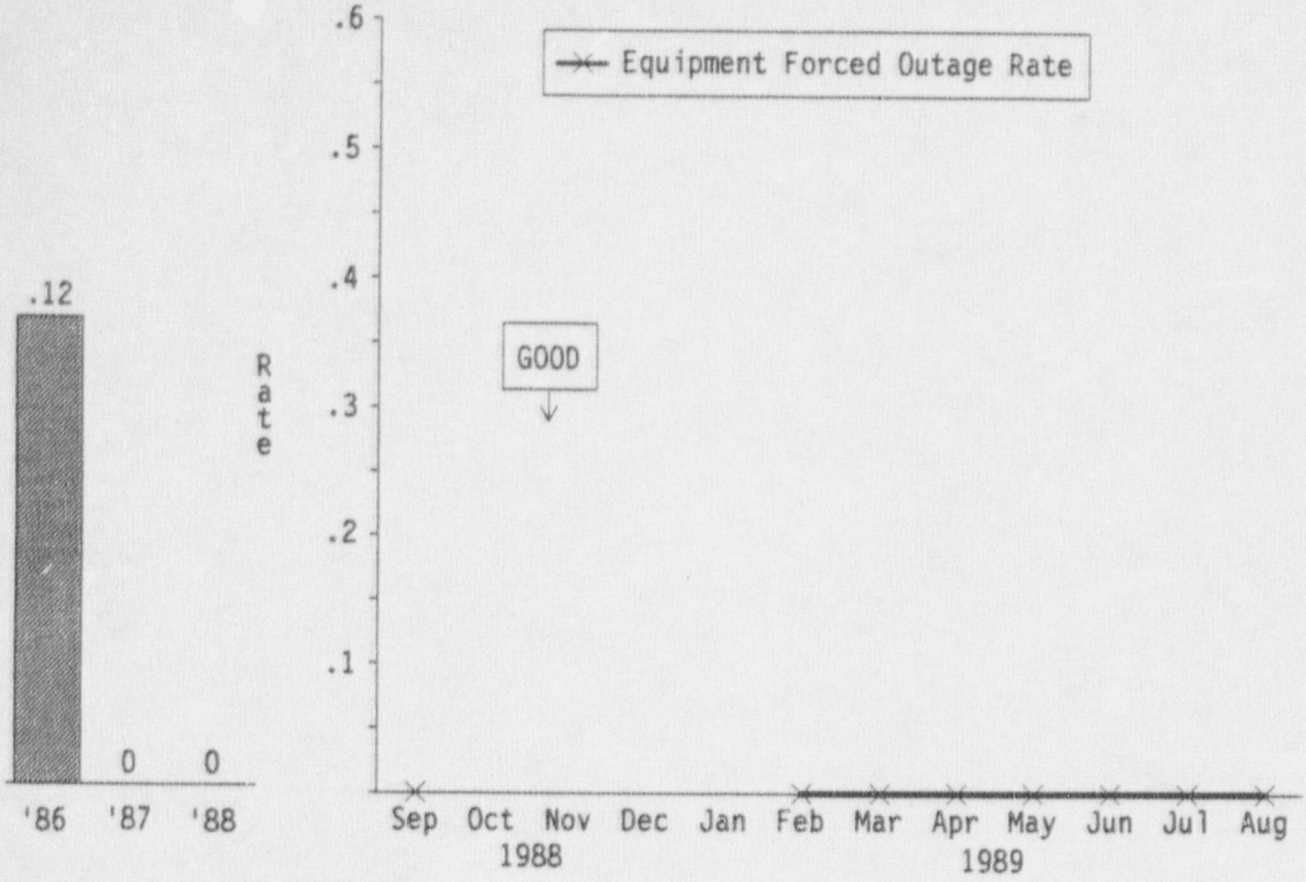


DAILY THERMAL OUTPUT

The above thermal output graph displays the daily operating power level, the 1500 thermal megawatt average technical specification limit, and the 1495 thermal megawatt Fort Calhoun goal. The cross hatched area represents the difference between the maximum allowable operation and the actual plant operation.

The percent power operation of the Fort Calhoun Station was approximately 100% for the month of August.

Adverse Trend: None

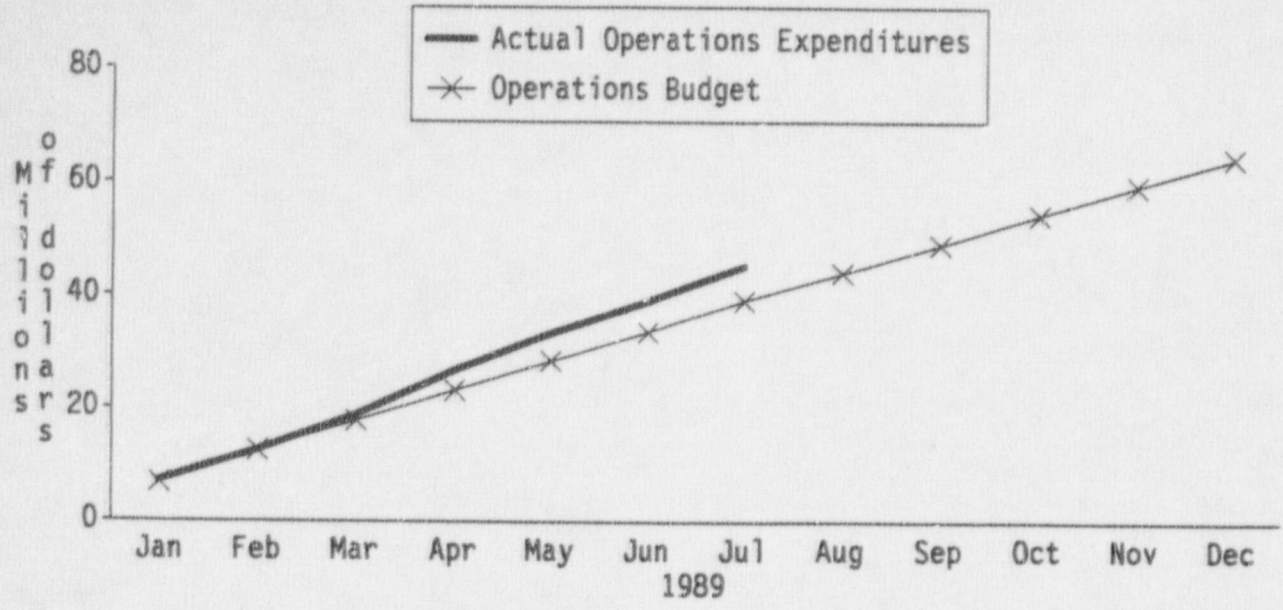


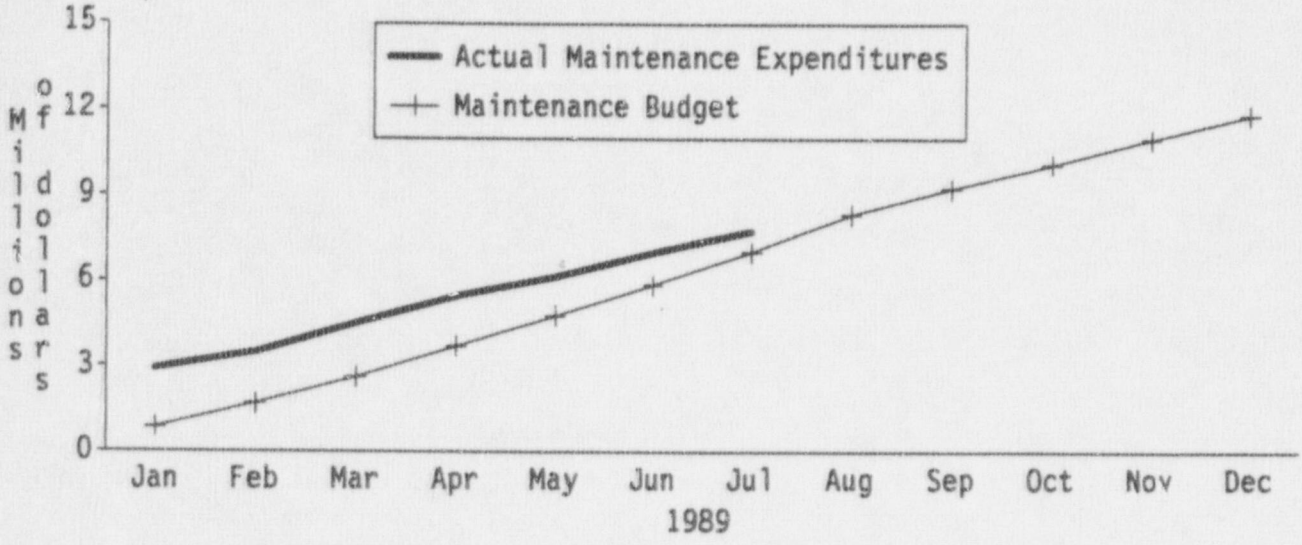
EQUIPMENT FORCED OUTAGES PER 1000 CRITICAL HOURS

There were zero forced outage hours reported for the Fort Calhoun Station during the month of August, 1989. The current value for the number of equipment forced outages per 1000 critical hours for 1989 is zero.

The last equipment forced outage occurred in 1986 and was due to a failed electrical inverter.

Adverse Trend: None





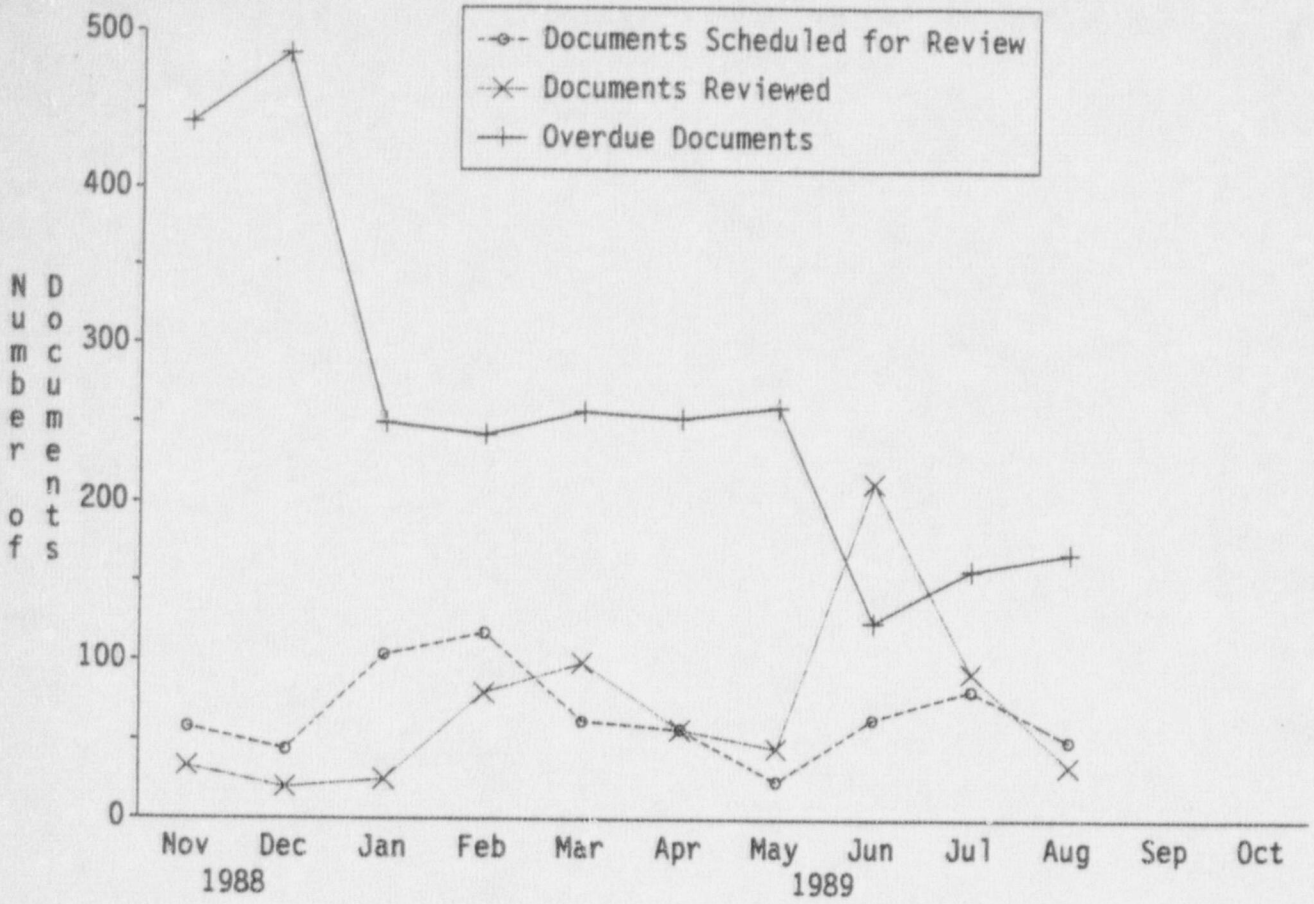
OPERATIONS AND MAINTENANCE BUDGET

The Operations and Maintenance Budget Indicator shows the budget year to date as well as the actual expenditures for operations and maintenance for the Fort Calhoun Station. This indicator is one month behind the reporting month due to the time for collecting and processing the data.

The budget year to date for operations was 39.2 million dollars for July while the actual cumulative expenditures for July totaled 45.4 million dollars.

The budget year to date for maintenance was 7.0 million dollars for July while the actual cumulative expenditures for July totaled 7.8 million dollars.

Adverse Trends: Since March the actual expenditures for operations have been above budget. This is due to the fact that several items were not budgeted for in the 1989 budget. These items include; extension of the 1988 Refueling Outage, contract security support, radiation protection support, and Design Basis support.

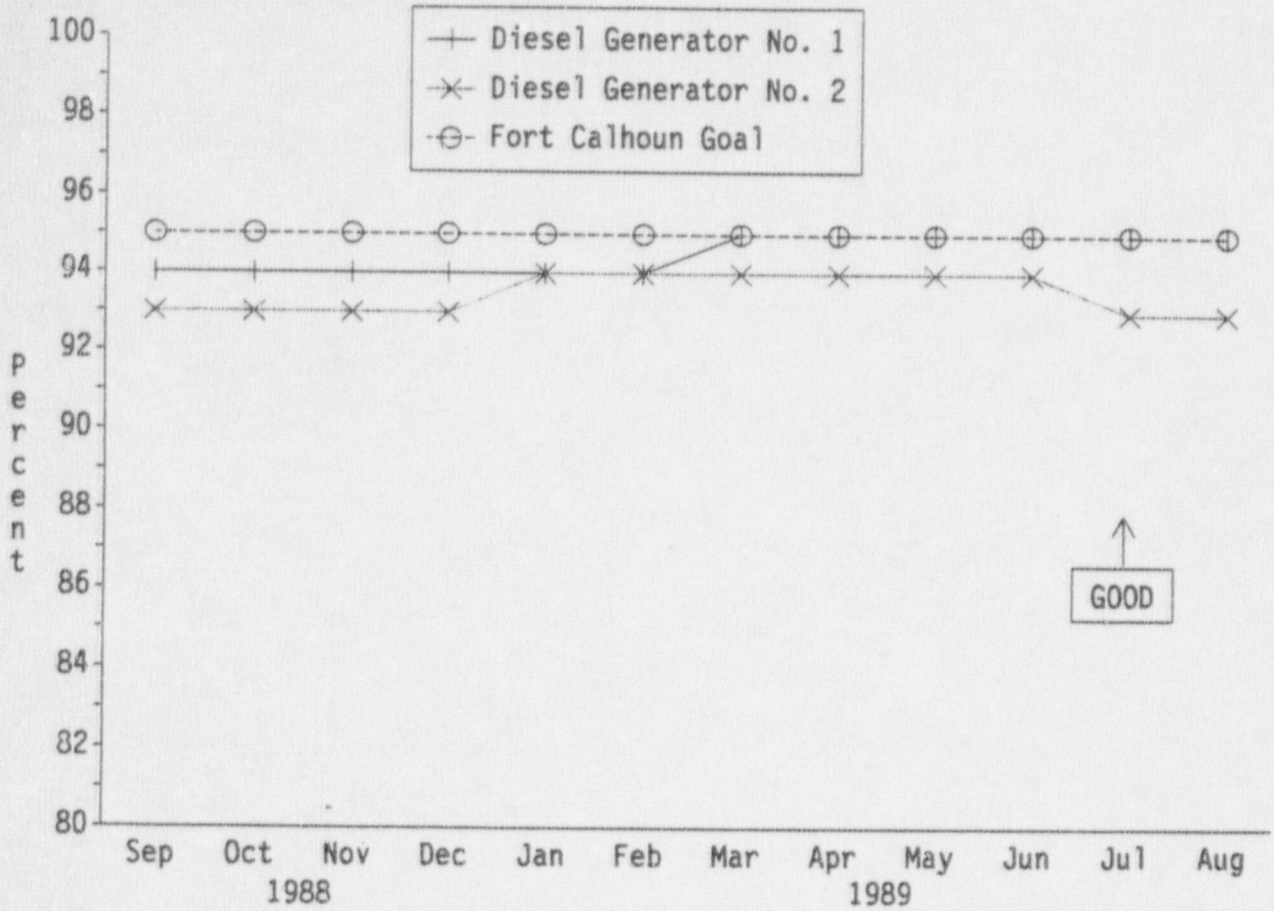


DOCUMENT REVIEW

This indicator shows the number of documents reviewed for the reporting month, scheduled for review, and the document reviews that are overdue. These document reviews are performed in house and include Special Procedures, the Site Security Plan, Maintenance Procedures, Preventive Maintenance, and the Operating Manual. The documents included in the Operating Manual are Standing Orders, the Technical Data Book, the Radiological Emergency Response Plan, Emergency Plan Implementing Procedures, Operating Procedures, Emergency Operating Procedures, Abnormal Operating Procedures, Operating Instructions, the Radiological Protection Manual, the Chemistry Manual, the Fuel Management Manual, Surveillance Tests, and Calibration Procedures.

During August there were 34 document reviews completed while 50 document reviews were scheduled. At the end of August, there were 169 document reviews overdue.

Adverse Trend: The number of overdue document reviews has been increasing since June. The number of overdue document reviews is expected to decrease due to an increased effort to review the overdue documents.



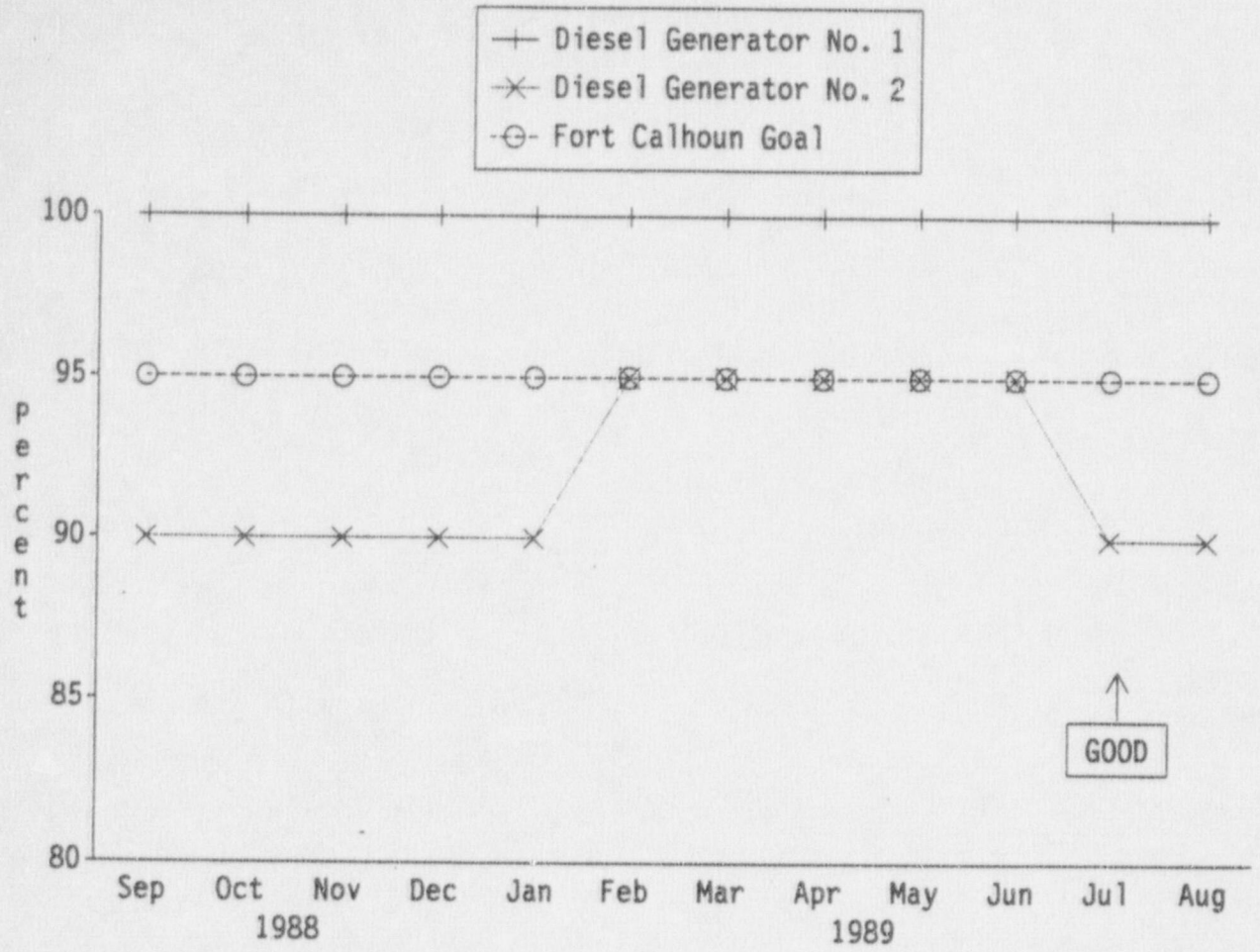
DG RELIABILITY
LAST 100 DEMANDS

Diesel generator D-1 has a 95 percent reliability factor over the last 100 valid demands.

Diesel generator D-2 has a 93 percent reliability factor over the last 100 valid demands.

The Fort Calhoun goal for the diesel generator reliability is 95%. Presently D-1 meets this goal.

Adverse Trend: Diesel generator D-2 had a failure during the month of July which decreased its reliability over the last 100 demands. This was due to the present ventilation scheme for the diesels and missing insulation from the diesel exhaust systems.



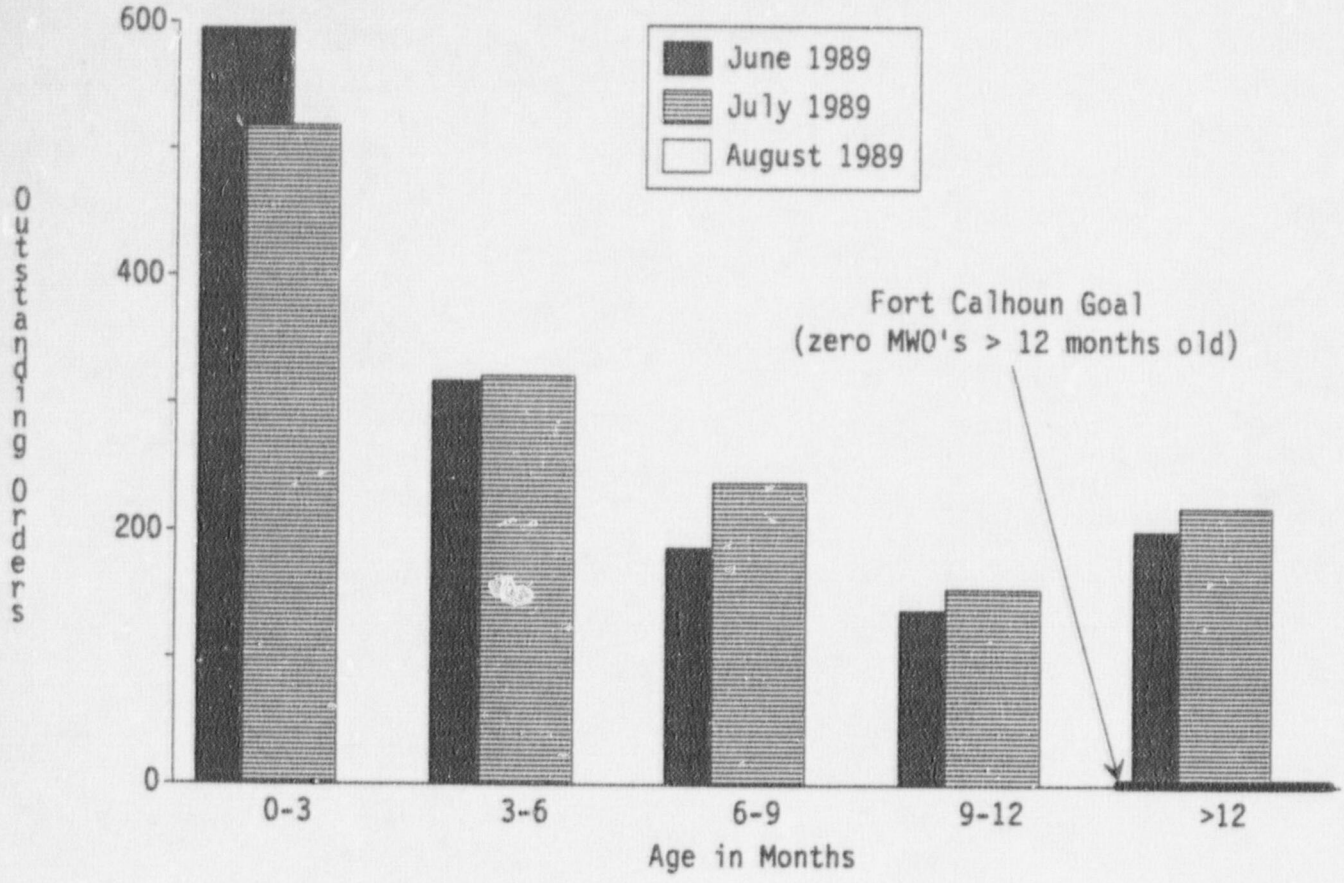
DG RELIABILITY
LAST 20 DEMANDS

Diesel generator D-1 has not had a failure in the last 20 demands on the unit. The present reliability factor for D-1 is 100% over the last 20 demands.

Diesel generator D-2 has had 2 failures in the last 20 demands. D-2 has a 90% reliability factor over the last 20 demands.

The Fort Calhoun goal for the diesel generator reliability for the last 20 demands is set at 95%. Diesel D-1 presently meets this goal.

Adverse Trend: Diesel generator D-2 had a failure during the month of July which decreased its reliability over the last 20 demands. This was due to the present ventilation scheme for the diesels and missing insulation from the diesel exhaust systems.



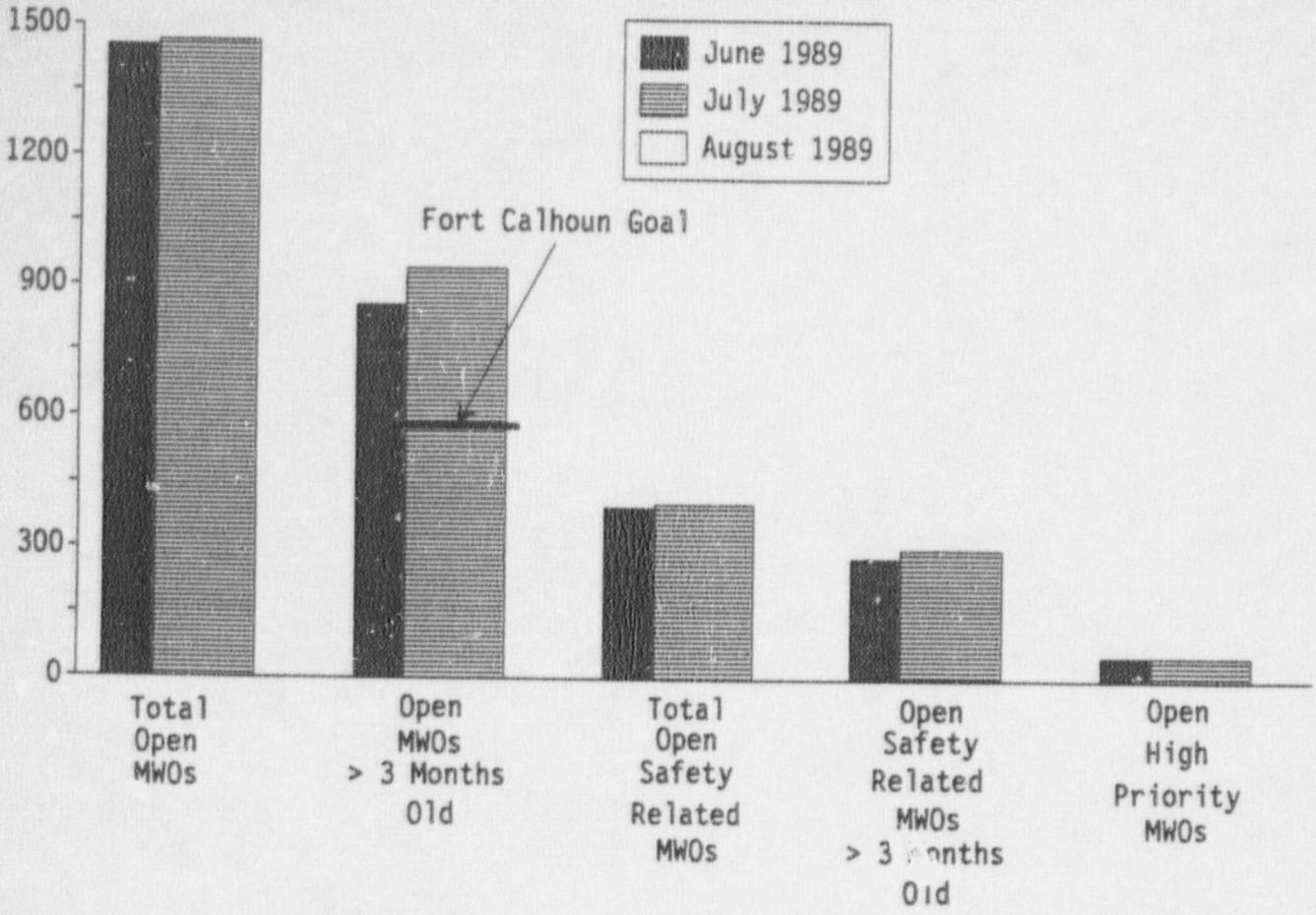
AGE OF OUTSTANDING MAINTENANCE WORK ORDERS
(NON-OUTAGE)

The above bar chart breaks down the maintenance work orders by their age in months and trends each category over the previous three months.

The Fort Calhoun goal is to have zero outstanding maintenance work orders greater than 12 months old.

This indicator is in the process of being modified. This modification will include a change in the data source for this indicator. The information for the month of August, 1989, will be shown in the September, 1989 Performance Indicators Report.

Adverse Trend: An adverse trend for this indicator is indeterminable until after the performance indicator revision is completed.



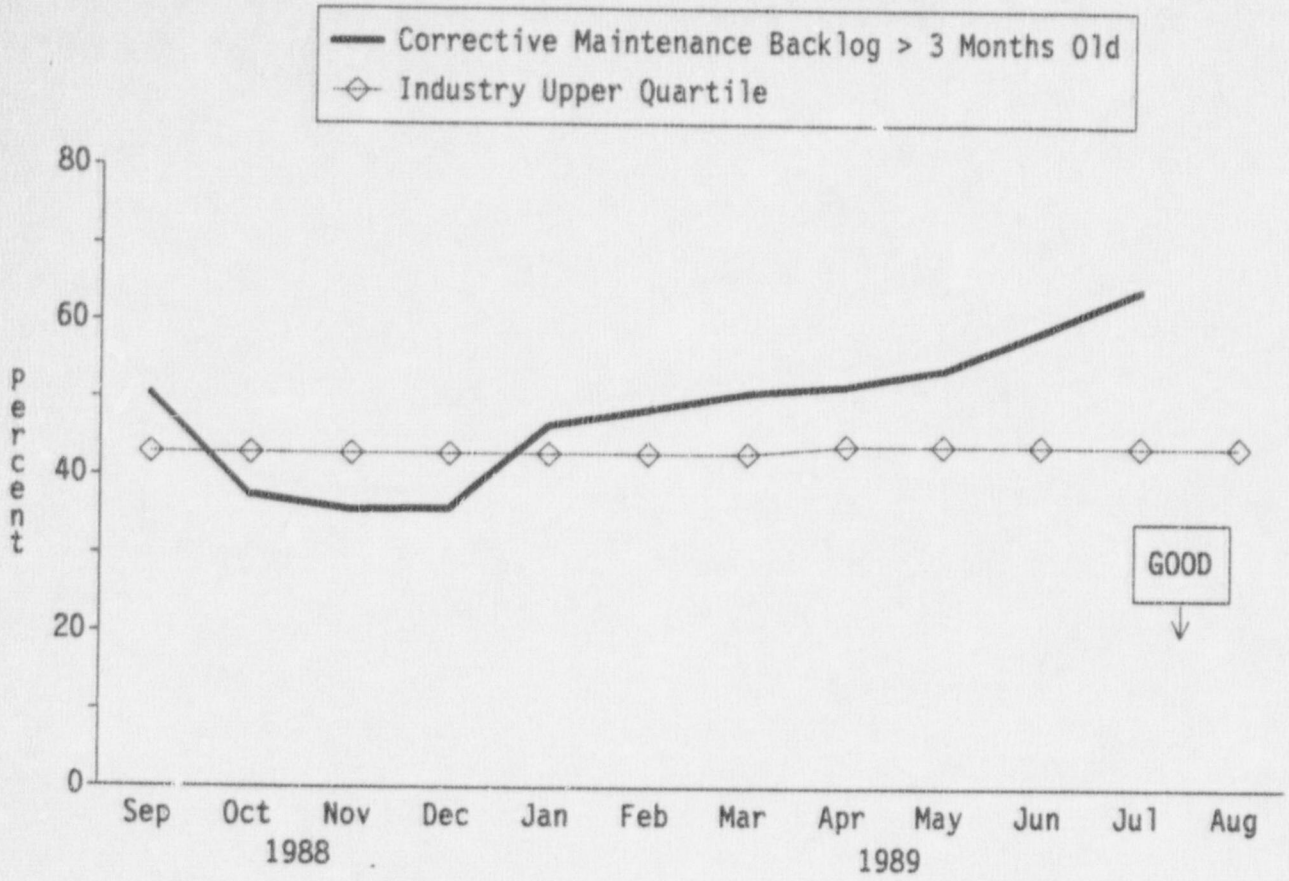
MAINTENANCE WORK ORDER BREAKDOWN
(NON-OUTAGE)

This indicator shows the total number of open non-outage maintenance work orders at the end of the reporting month, along with a breakdown by several key categories.

The Fort Calhoun goal is to have zero MWO's older than the average age of MWO's that are greater than three months old. The July goal was to have less than 584 open MWO's that are greater than three months old.

This indicator is in the process of being modified. This modification will include a change in the data source for this indicator. The information for the month of August, 1989, will be shown in the September, 1989 Performance Indicators Report.

Adverse Trend: An adverse trend for this indicator is indeterminable until after the performance indicator revision is completed.



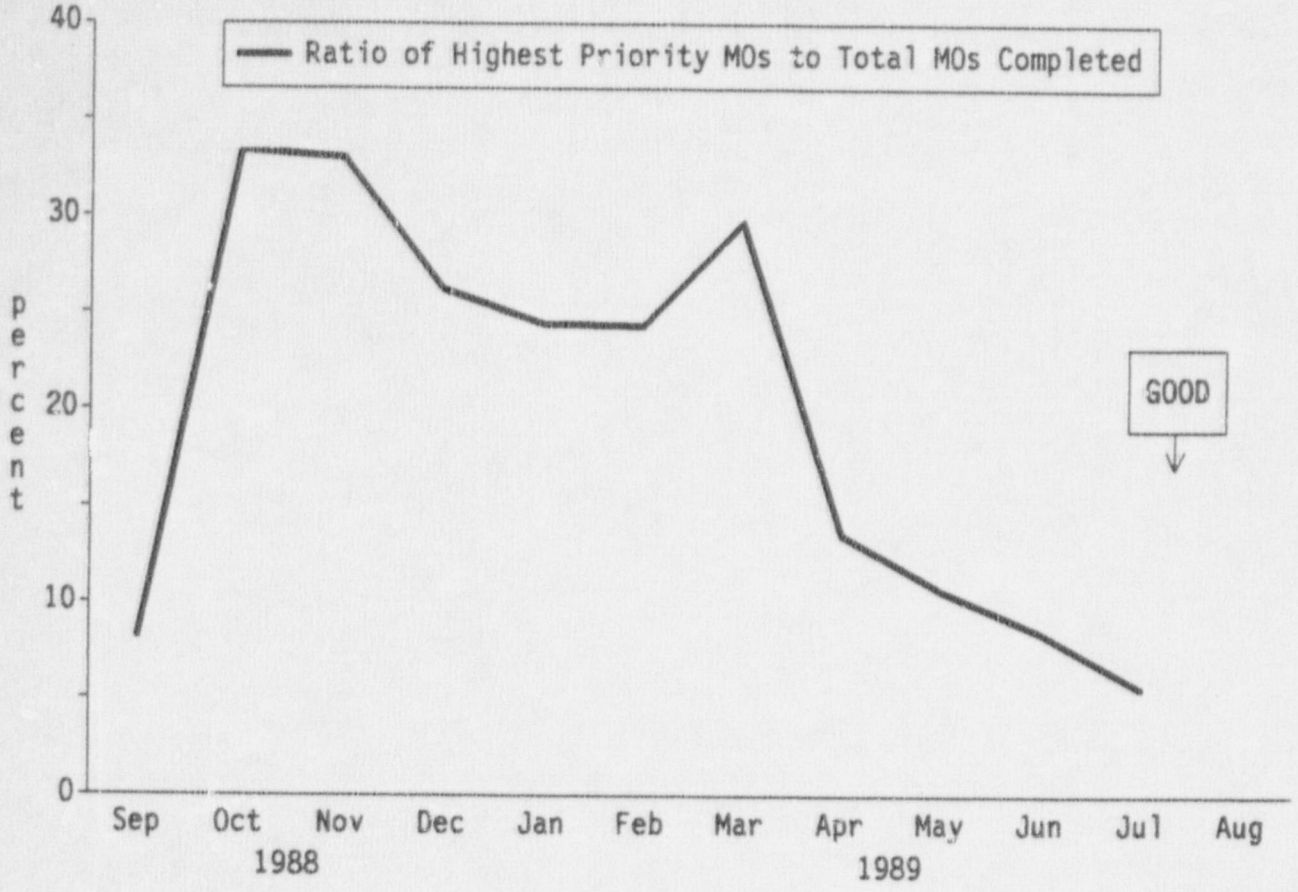
CORRECTIVE MAINTENANCE BACKLOG GREATER THAN 3 MONTHS OLD (NON-OUTAGE)

This indicator shows the percentage of open non-outage corrective maintenance work orders that are greater than three months old at the end of the reporting month.

The industry upper quartile value for corrective maintenance backlog greater than 3 months old is 44.1%.

This indicator is in the process of being modified. This modification will include a change in the data source for this indicator. The information for the month of August, 1989, will be shown in the September, 1989 Performance Indicators Report.

Adverse Trend: An adverse trend for this indicator is indeterminable until after the performance indicator revision is completed.



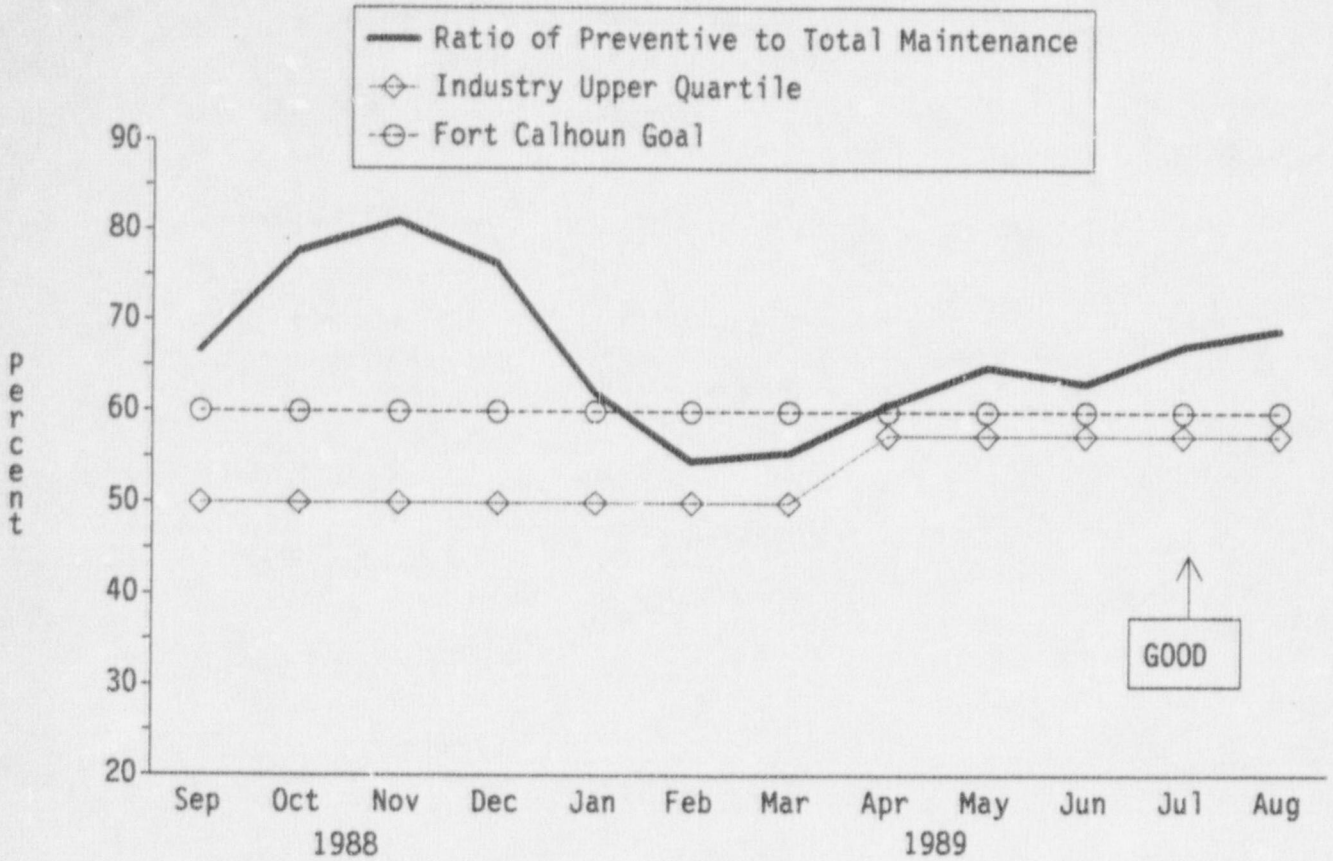
RATIO OF HIGHEST PRIORITY MWO'S TO TOTAL MWO'S COMPLETED
(NON-OUTAGE)

The purpose of this indicator is to monitor the ability to effectively prioritize, plan, and schedule corrective maintenance. A higher ratio indicates that a comparatively greater number of emergency type maintenance activities have been required to support plant operation.

The industry upper quartile for the ratio of highest priority MWO's to total MWO's completed is no longer available. This indicator was discontinued for 1989 by INPO.

This indicator is in the process of being modified. This modification will include a change in the data source for this indicator. The information for the month of August, 1989, will be shown in the September, 1989 Performance Indicators Report.

Adverse Trend: An adverse trend for this indicator is indeterminable until after the performance indicator revision is completed.



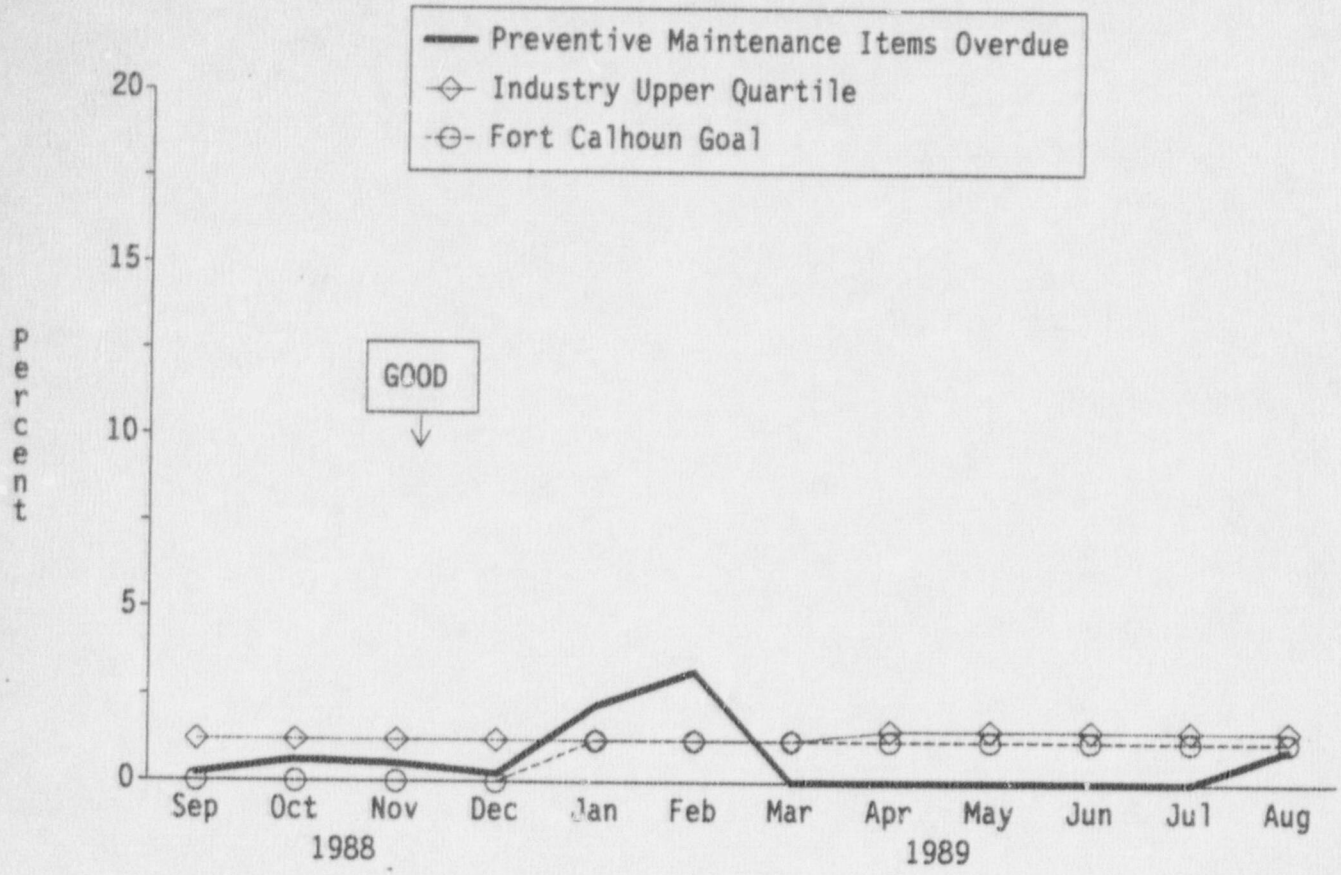
RATIO OF PREVENTIVE TO TOTAL MAINTENANCE (NON-OUTAGE)

The ratio of preventive to total maintenance indicator shows the ratio of completed non-outage preventive maintenance to total completed non-outage maintenance. The ratio of preventive to total maintenance at the Fort Calhoun Station increased to 69.1% in August.

The Fort Calhoun goal is to have a ratio of preventive to total maintenance greater than 60%.

The industry upper quartile value for the ratio of preventive to total maintenance is 57.4%. The Fort Calhoun Station is currently in the upper quartile of nuclear plant performance in this area.

Adverse Trend: None



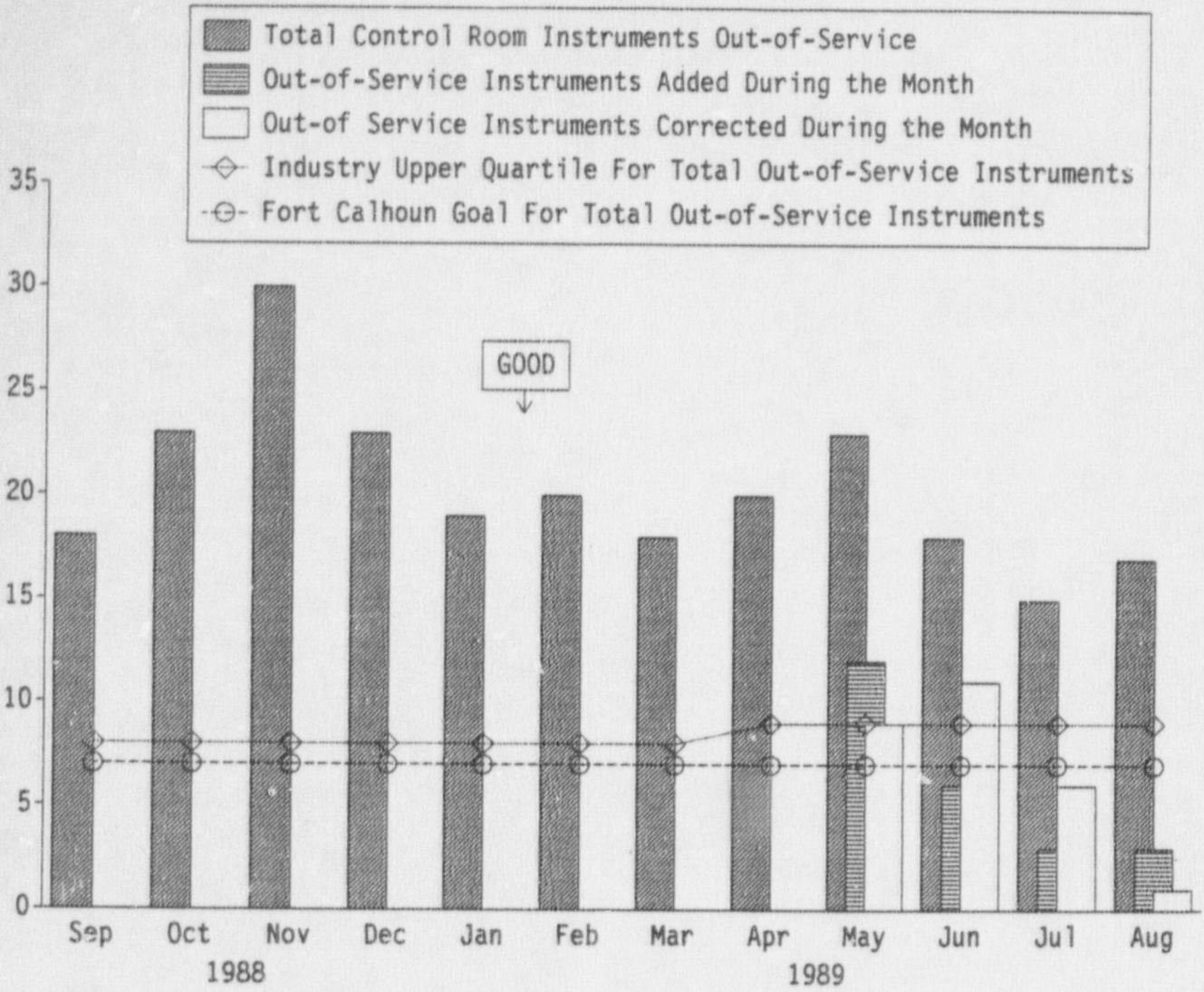
PREVENTIVE MAINTENANCE ITEMS OVERDUE

The purpose of this indicator is to monitor progress in the administration and execution of preventive maintenance programs. A small percentage of preventive maintenance items overdue indicates a station commitment to the preventive maintenance program and an ability to plan, schedule, and perform preventive maintenance tasks as programs require.

The preventive maintenance items overdue value increased to 0.99% for the month of August. There were a total of 991 preventive maintenance items completed during the month with 10 preventive maintenance items not completed within the allowable grace period.

The Fort Calhoun goal is to have less than 1.2% preventive maintenance items overdue. The industry upper quartile for preventive maintenance items overdue is 1.5%. The Fort Calhoun Station is currently in the upper quartile for this indicator.

Adverse Trend: None



NUMBER OF OUT-OF-SERVICE
CONTROL ROOM INSTRUMENTS

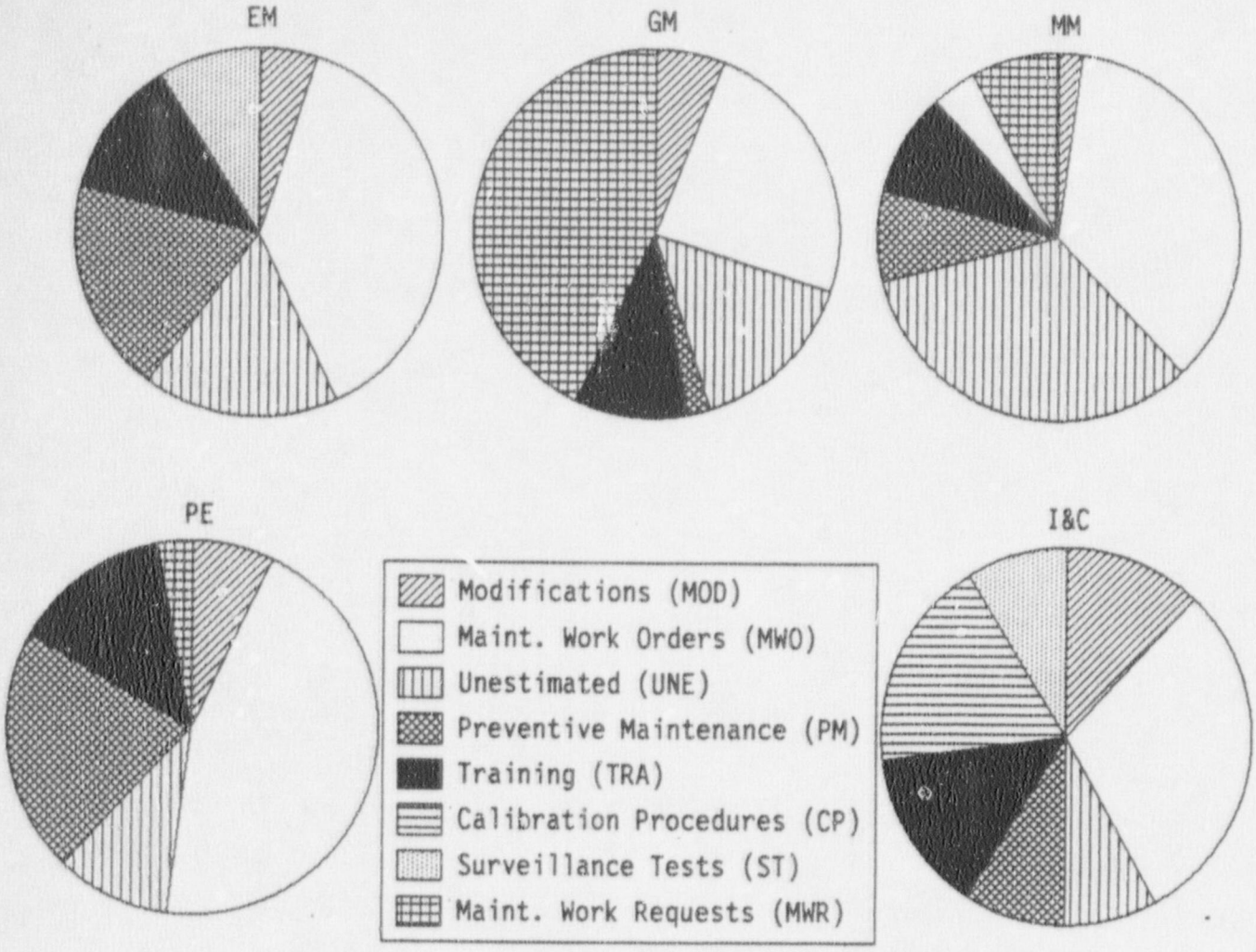
The Number of Out-of-Service Control Room Instruments Indicator was changed for the month of May, 1989. In addition to the previously shown total number of control room instruments out-of-service, This indicator shows the number of out-of-service control room instruments that were corrected during the reporting month and the number of control room instruments that were added to the out-of-service control room instruments list during the reporting month.

There was a total of 17 out-of-service control room instruments at the end of August. During the month of August, one out-of-service instrument was corrected and 3 instruments were added to the out-of-service instruments list.

The Fort Calhoun goal is to have less than 7 out-of-service control room instruments.

The industry upper quartile value for the number of out-of-service control room instruments is 9.

Adverse Trend: None

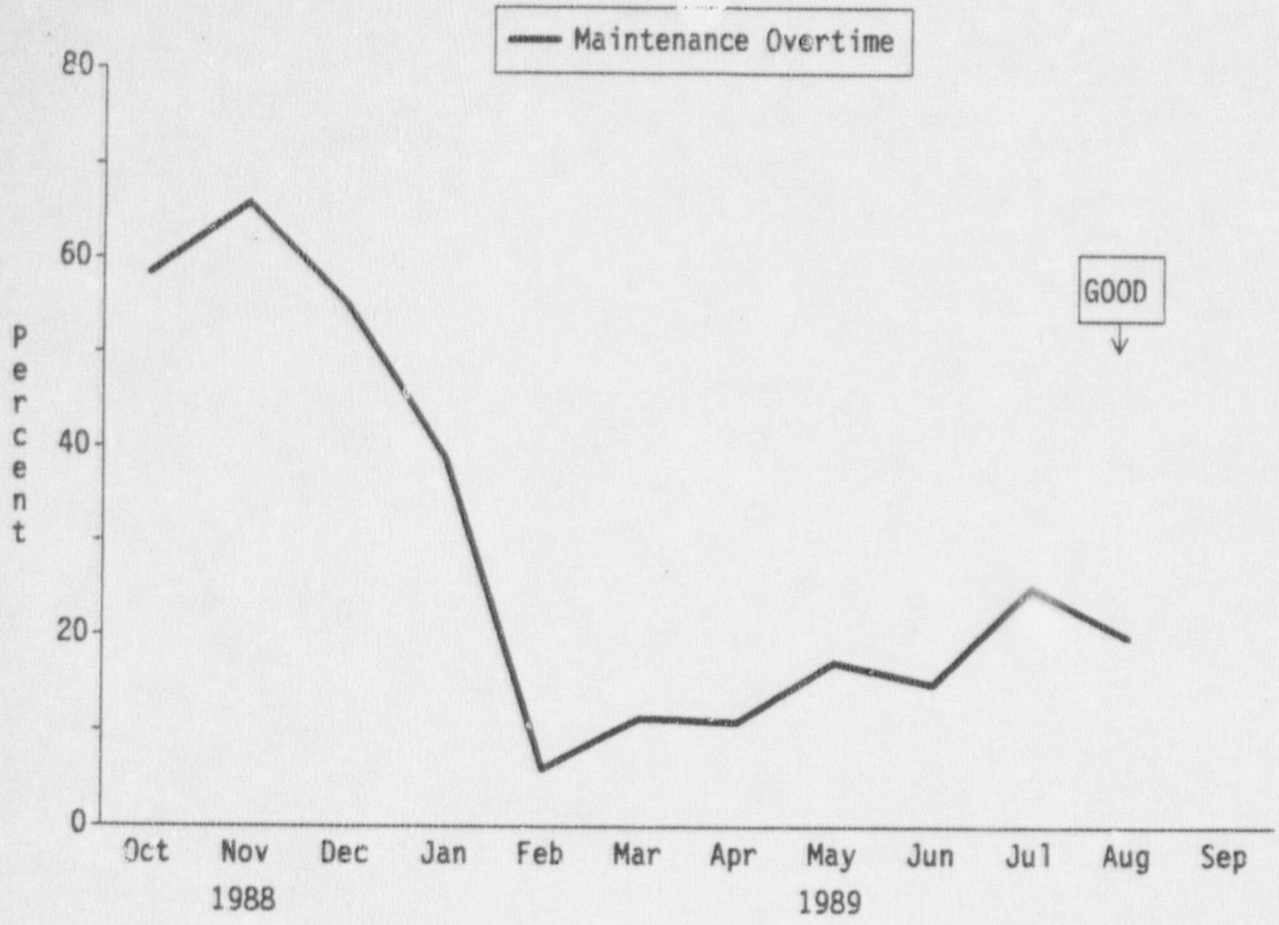


CRAFT WORK ACTIVITY

The Craft Work Activity Indicator shows the percentage of a type of work each craft (plant personnel only) performed during the month. The crafts that are represented in this indicator are Electrical Maintenance (EM), General Maintenance (GM), Mechanical Maintenance (MM), Pressure Equipment (PE), and Instrumentation and Control (I&C).

	WORK ACTIVITY (IN PERCENT)							
CRAFT	MOD	MWO	UNE	PM	TRA	CP	ST	MWR
EM	4.93	38.39	16.83	19.17	11.55	0.00	9.13	0.00
GM	6.12	23.62	14.98	2.34	9.56	0.00	0.00	43.38
MM	2.39	36.13	33.04	7.56	9.23	0.00	4.09	7.56
PE	6.61	45.00	10.48	20.91	14.29	0.00	0.00	2.71
I&C	12.33	29.69	7.56	8.98	14.09	18.38	8.83	0.14

Adverse Trend: None

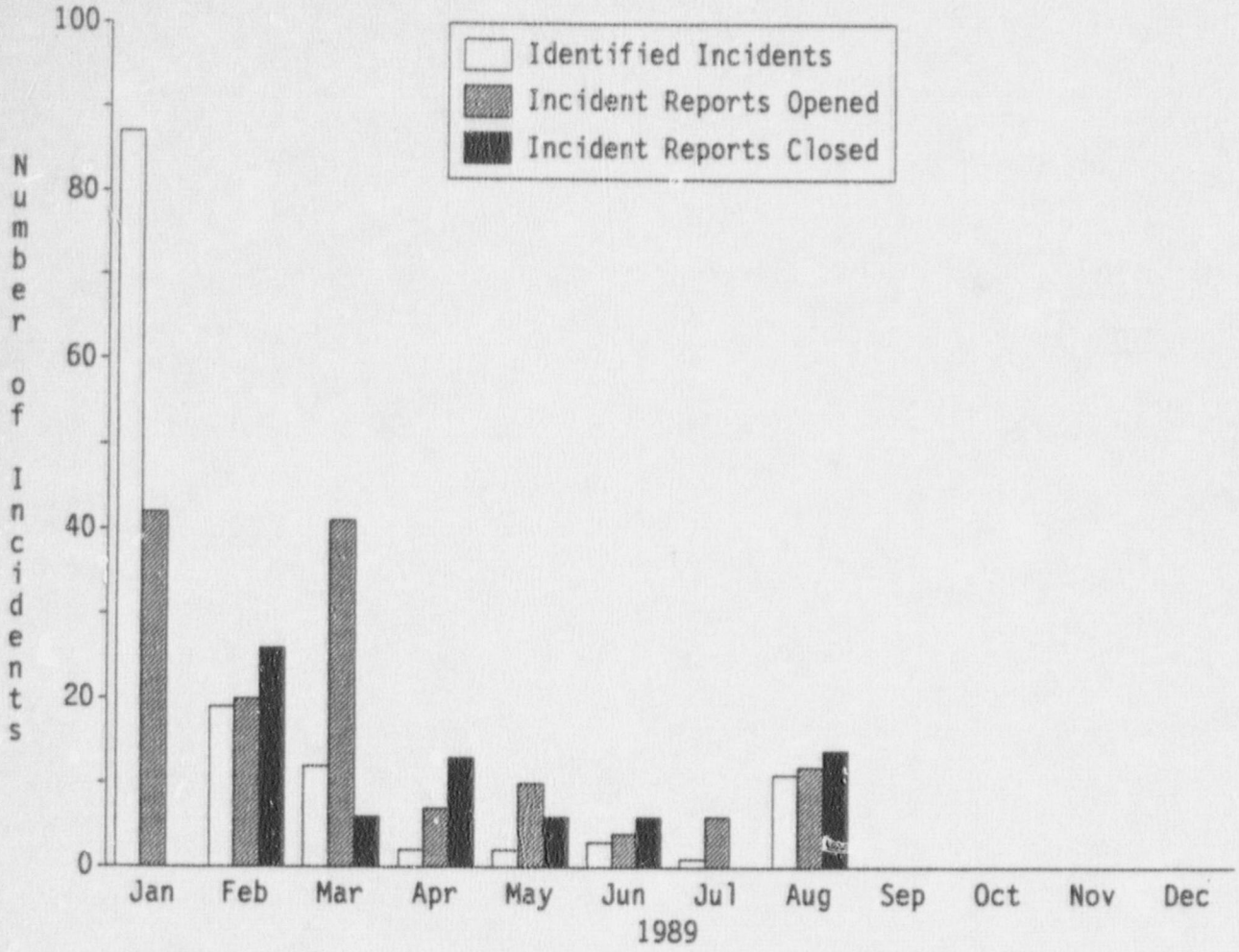


MAINTENANCE OVERTIME

The Maintenance Overtime Indicator monitors the ability to perform the desired maintenance activities with the allotted resources. Excessive overtime indicates insufficient resource allocation and can lead to errors due to fatigue.

The percent of overtime hours with respect to normal hours was 19.9% during the month of August, 1989.

Adverse Trend: None

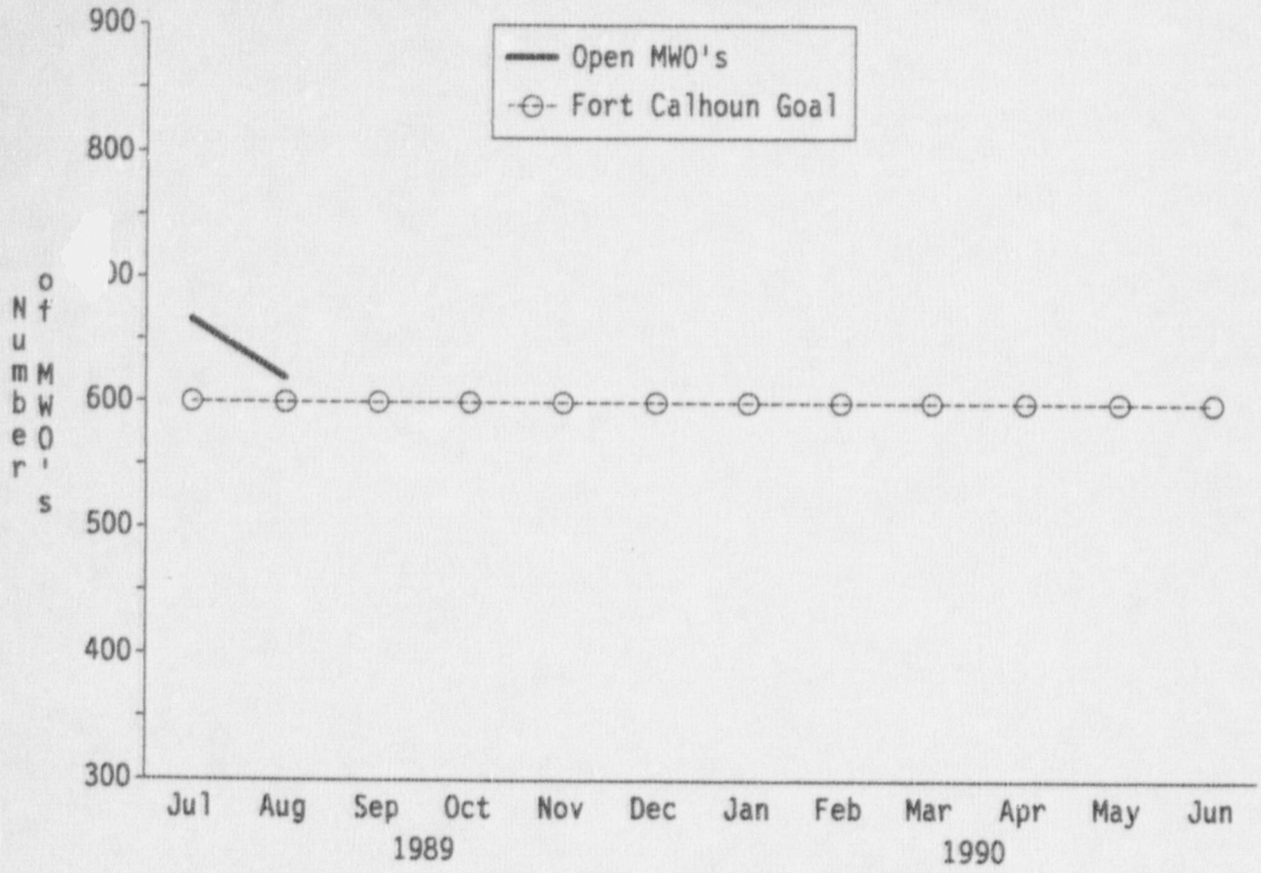


PROCEDURAL NONCOMPLIANCE INCIDENTS (MAINTENANCE)

This indicator shows the number of incidents identified (not yet written as an IR) each month involving maintenance, the number of incident reports opened each month involving maintenance, and the number of incident reports closed each month involving maintenance.

Description	June	July	August	Total Year to date
Incidents Identified	3	1	11	137
Incident Reports Opened	4	6	12	142
Incident Reports Closed	6	0	14	71

Adverse Trend: The number of incidents identified and the number of incidents that were opened during the month of August increased due to the closeout of old MO's.



MAINTENANCE WORK ORDER BACKLOG
(CORRECTIVE NON-OUTAGE MAINTENANCE)

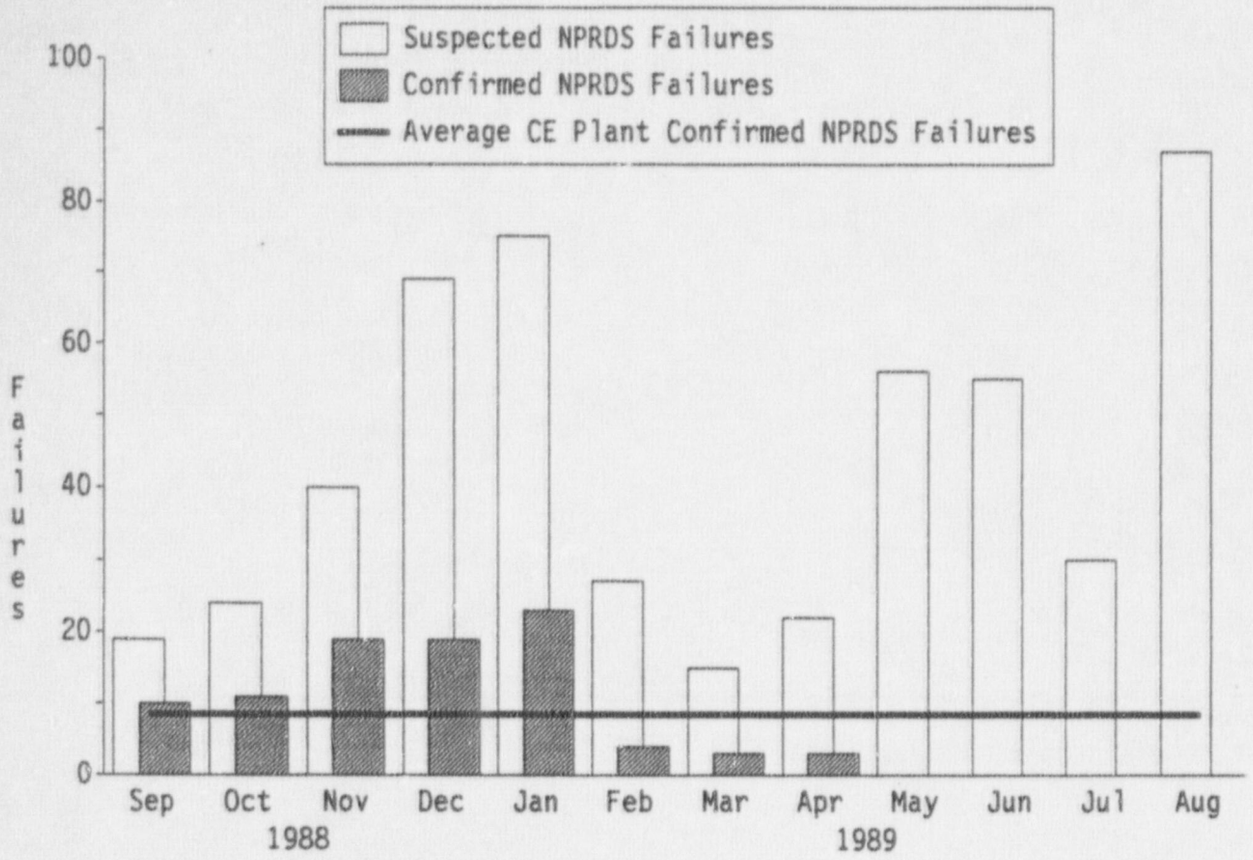
The Maintenance Work Order Backlog Indicator was added to the Fort Calhoun Station Performance Indicators Report for the month of July, 1989.

This indicator shows the number of corrective non-outage maintenance work orders that are open at the end of the reporting month.

The goal for this indicator is to have less than 600 corrective non-outage maintenance work orders remaining open. At the end of August, 1989, there were 619 corrective non-outage maintenance work orders remaining open.

This indicator was added to the Performance Indicators Report to trend Safety Enhancement Program (SEP) Item No. 36.

Adverse Trend: None



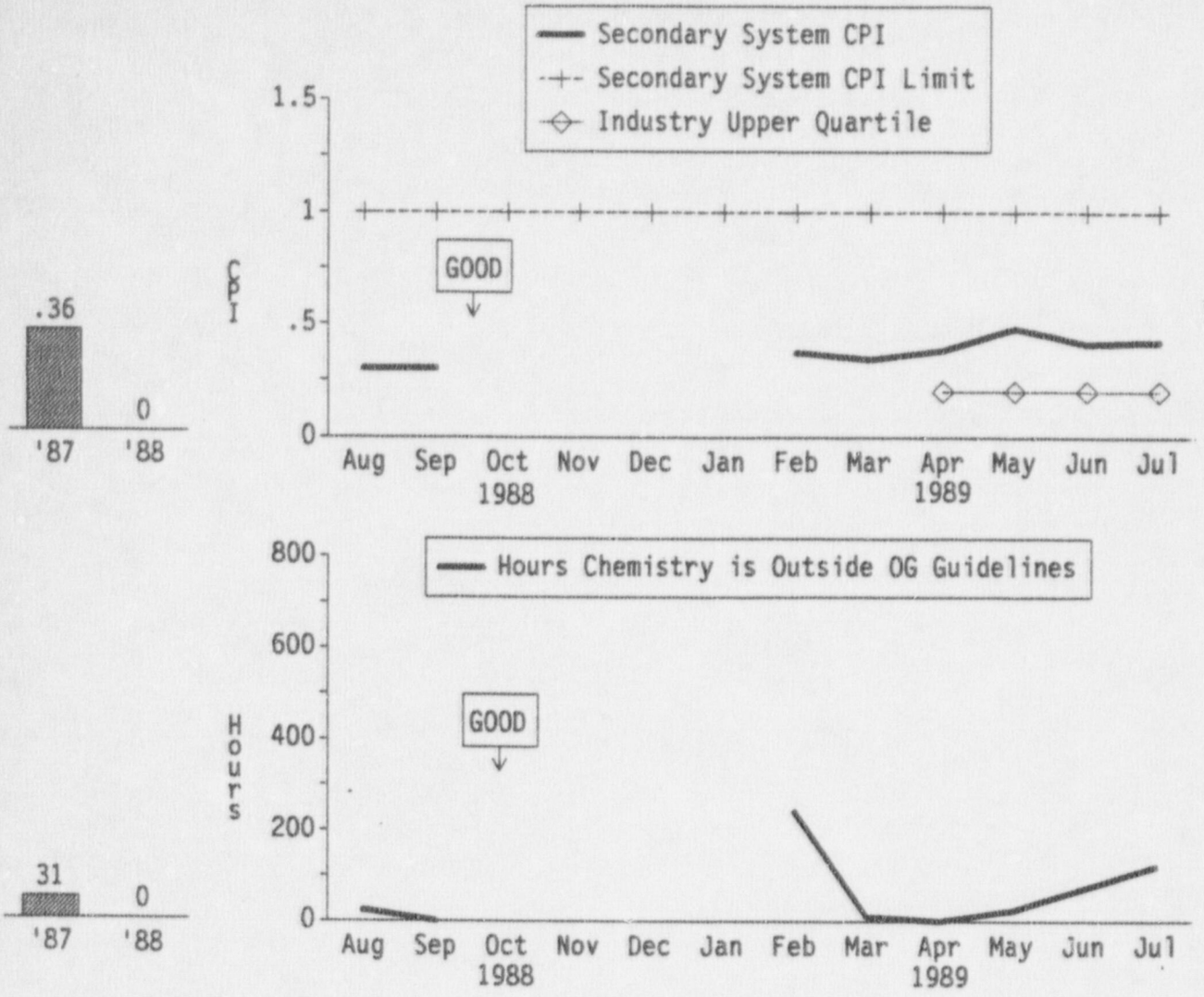
NUMBER OF NUCLEAR PLANT RELIABILITY
DATA SYSTEMS (NPRDS)
REPORTABLE FAILURES

The suspected NPRDS reportable failures are identified by possible equipment failures on the applicable Maintenance Work Order (MWO). Only after the MWO has been completed can the determination be made whether the equipment has failed or not. The entire 12 month graph is updated on a monthly basis to reflect completed MWO's.

In August, 1989 there were 0 confirmed NPRDS reportable failures and 87 suspected NPRDS failures.

The average value for confirmed reportable equipment failures at similar Combustion Engineering (CE) designed plants is 8.4 failures per unit. The Fort Calhoun Station has a 12 month average value of 7.7 confirmed NPRDS failures.

Adverse Trend: None



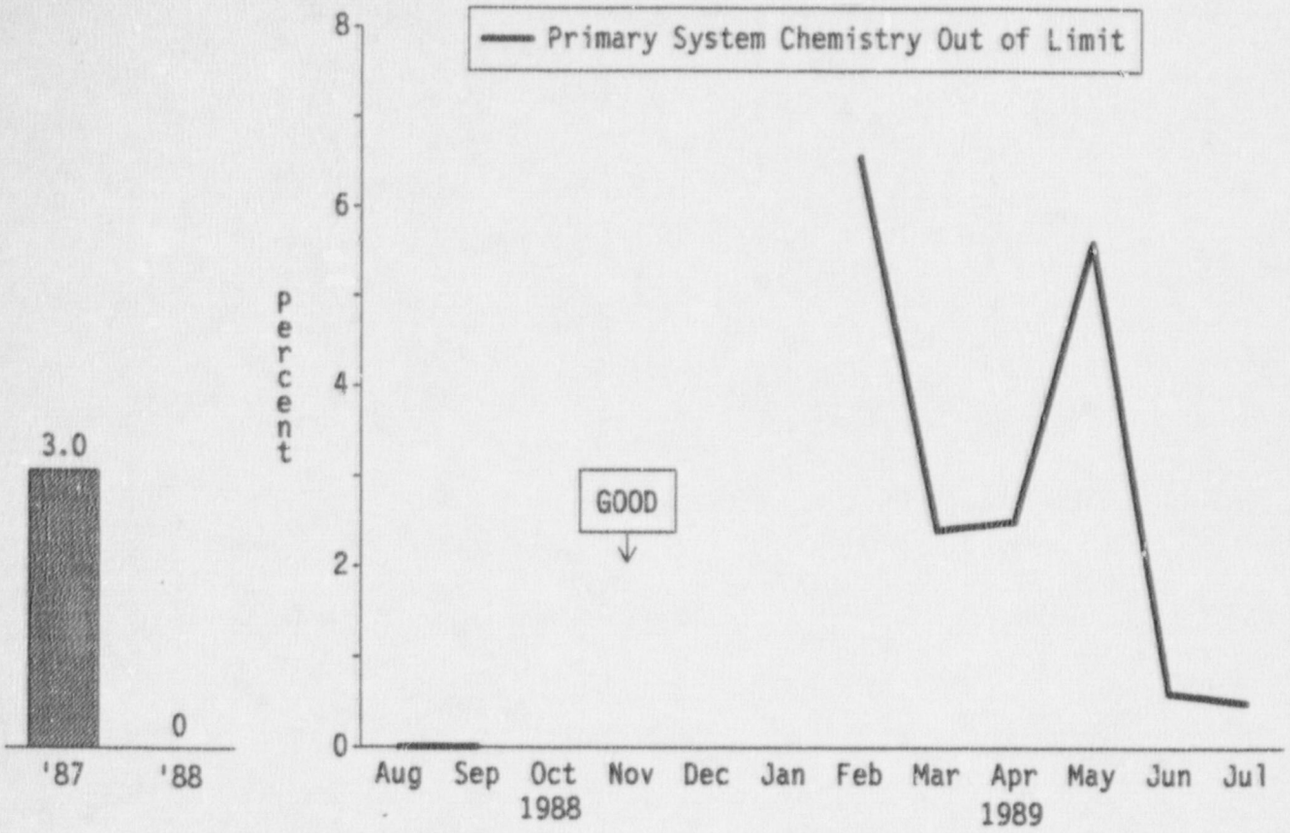
SECONDARY SYSTEM CHEMISTRY

The top graph, Secondary System Chemistry Performance Index (CPI), is a calculation based on the concentration of key impurities in the secondary side of the plant. These key impurities are the most likely cause of deterioration of the steam generators. The monthly CPI is plotted relative to the EPRI chemistry limit for CPI. The CPI was reported as 0.42 for the month of July. The industry upper quartile value for this indicator is 0.20.

The bottom graph, Hours Chemistry is Outside Owners Guidelines, tracks the total hours of 13 parameters exceeding guidelines during power operation. In July, 1989, there were 120 hours outside owners group guidelines. The industry upper quartile value for this indicator is no longer available.

The above two chemistry indicators are one month behind the reporting period due to the time needed for data collection and evaluation of the station chemistry data.

Adverse Trends: None

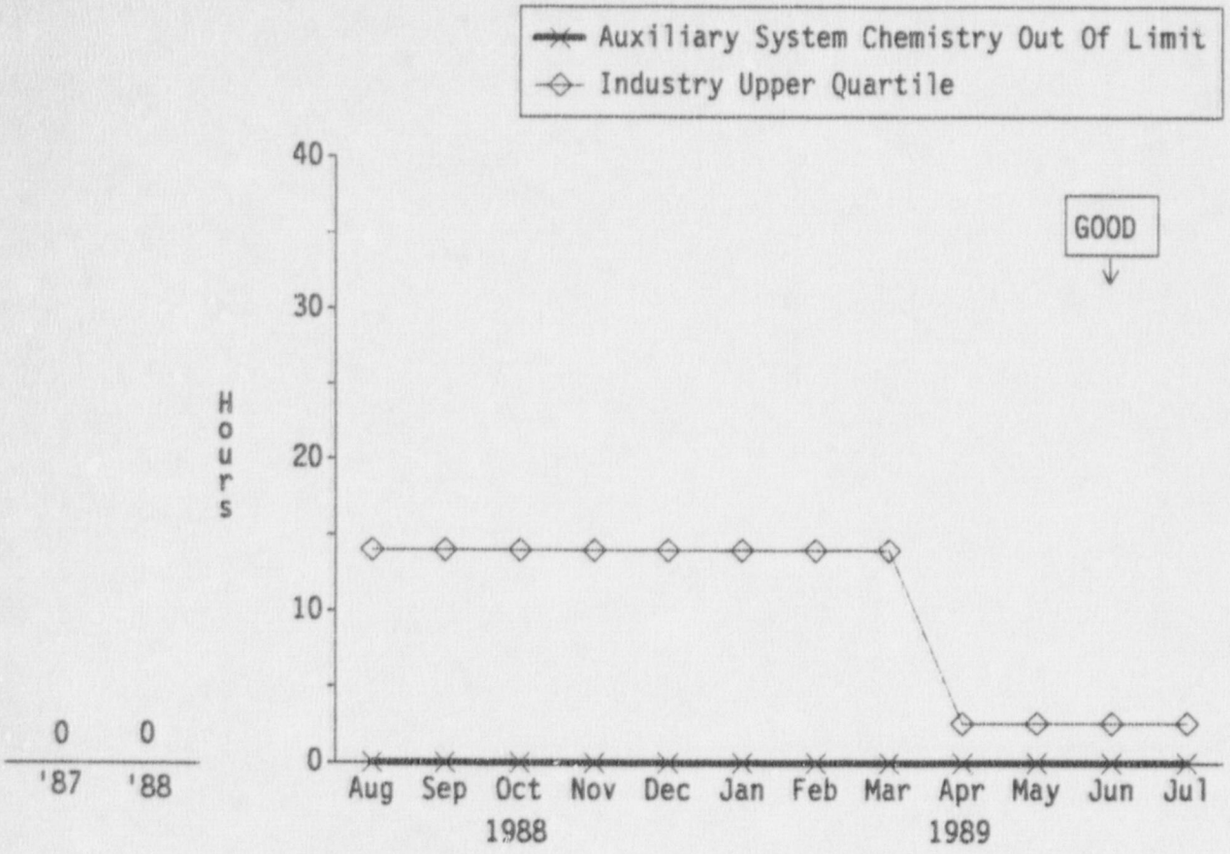


PRIMARY SYSTEM CHEMISTRY
PERCENT OF HOURS OUT OF LIMIT

The Primary System Chemistry - Percent of Hours Out of Limit indicator tracks the primary system chemistry performance by monitoring six key chemistry parameters.

The Primary System Chemistry Percent of Hours Out of Limit was reported as 0.5% for the month of July. 100% equates to all six parameters being out of limit for the month.

Adverse Trend: None



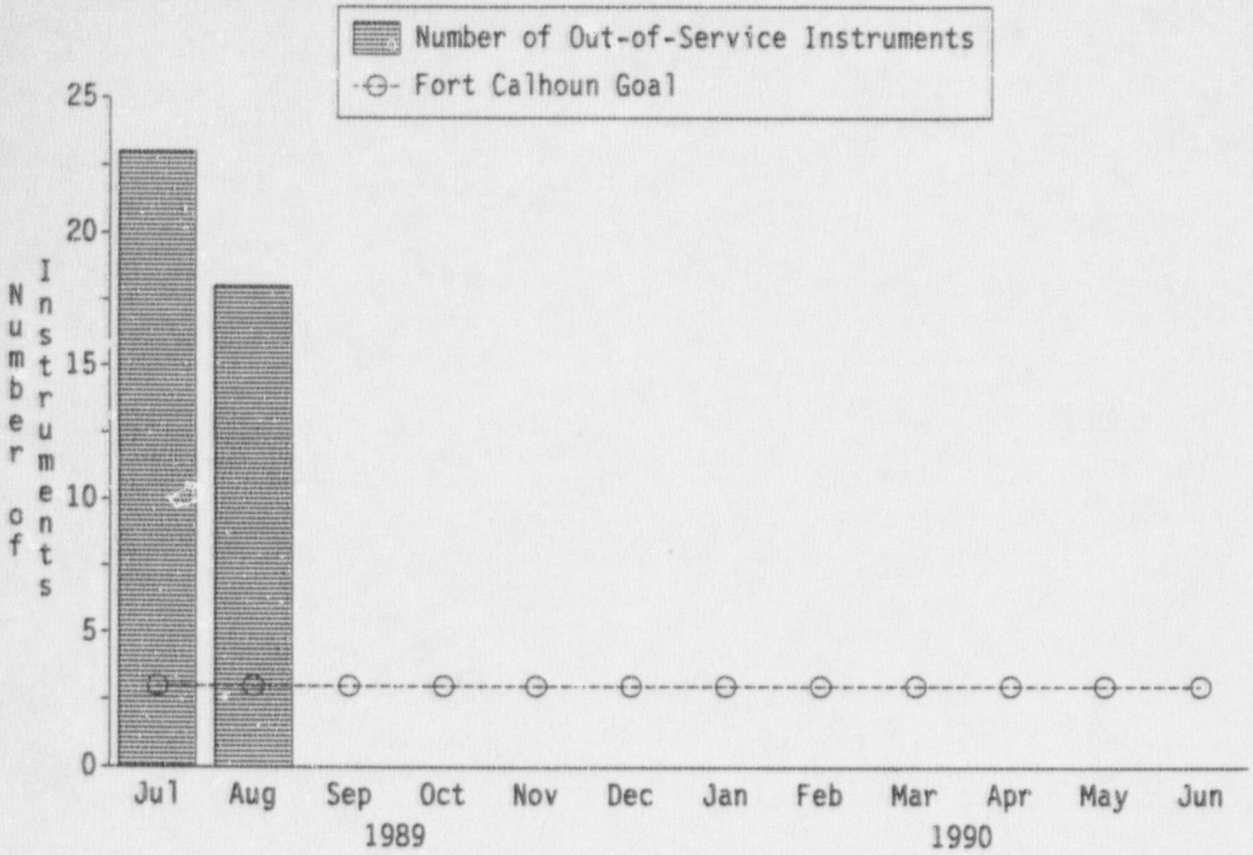
AUXILIARY SYSTEM (CCW) CHEMISTRY HOURS OUTSIDE STATION LIMITS

The Auxiliary System Chemistry Hours Outside Station Limits indicator tracks the monthly hours that the Component Cooling Water (CCW) system is outside the station chemistry limit. The above chemistry indicator is one month behind the reporting period due to the time needed for data collection and evaluation of the chemistry data for the station.

The auxiliary system chemistry hours outside station limits for the month of July, 1989 was reported as zero.

The industry upper quartile value for auxiliary systems chemistry hours outside station limits is 2.6 hours. The Fort Calhoun Station is currently performing in the industry upper quartile for this area.

Adverse Trend: None



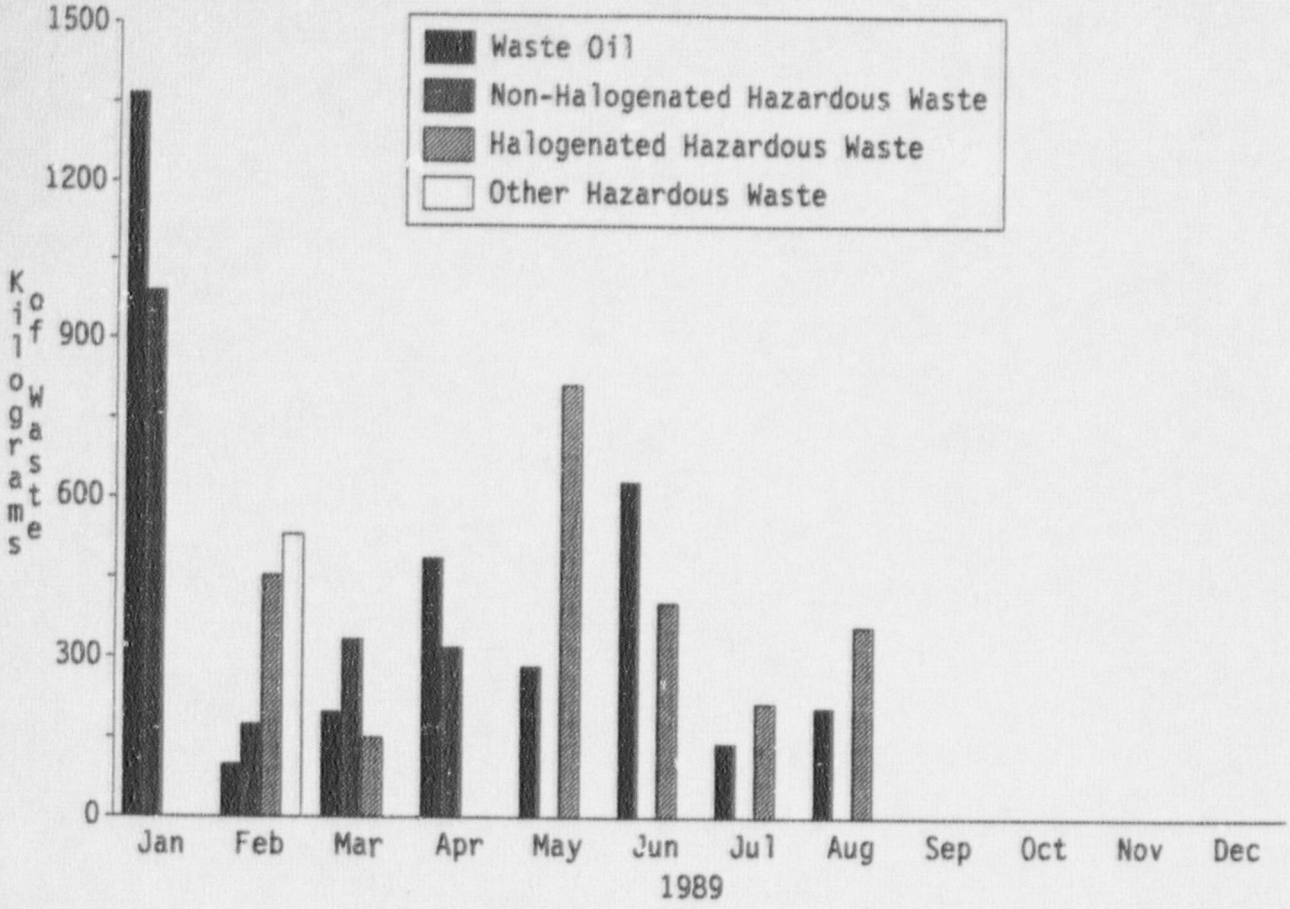
IN-LINE CHEMISTRY INSTRUMENTS OUT-OF-SERVICE

A Fort Calhoun Station goal has been added to the In-Line Chemistry Instruments Out-of-Service Indicator for the month of August, 1989. This goal is to have less than 3 in-line chemistry instruments out-of-service.

This indicator shows the total number of in-line chemistry system instruments that are out-of-service at the end of the reporting month. The chemistry systems involved in this indicator include the Secondary System and the Post Accident Sampling System (PASS).

At the end of August there were a total of 18 in-line chemistry instruments that were out-of-service. Thirteen of these instruments were from the Secondary System and five were from PASS.

Adverse Trend: None



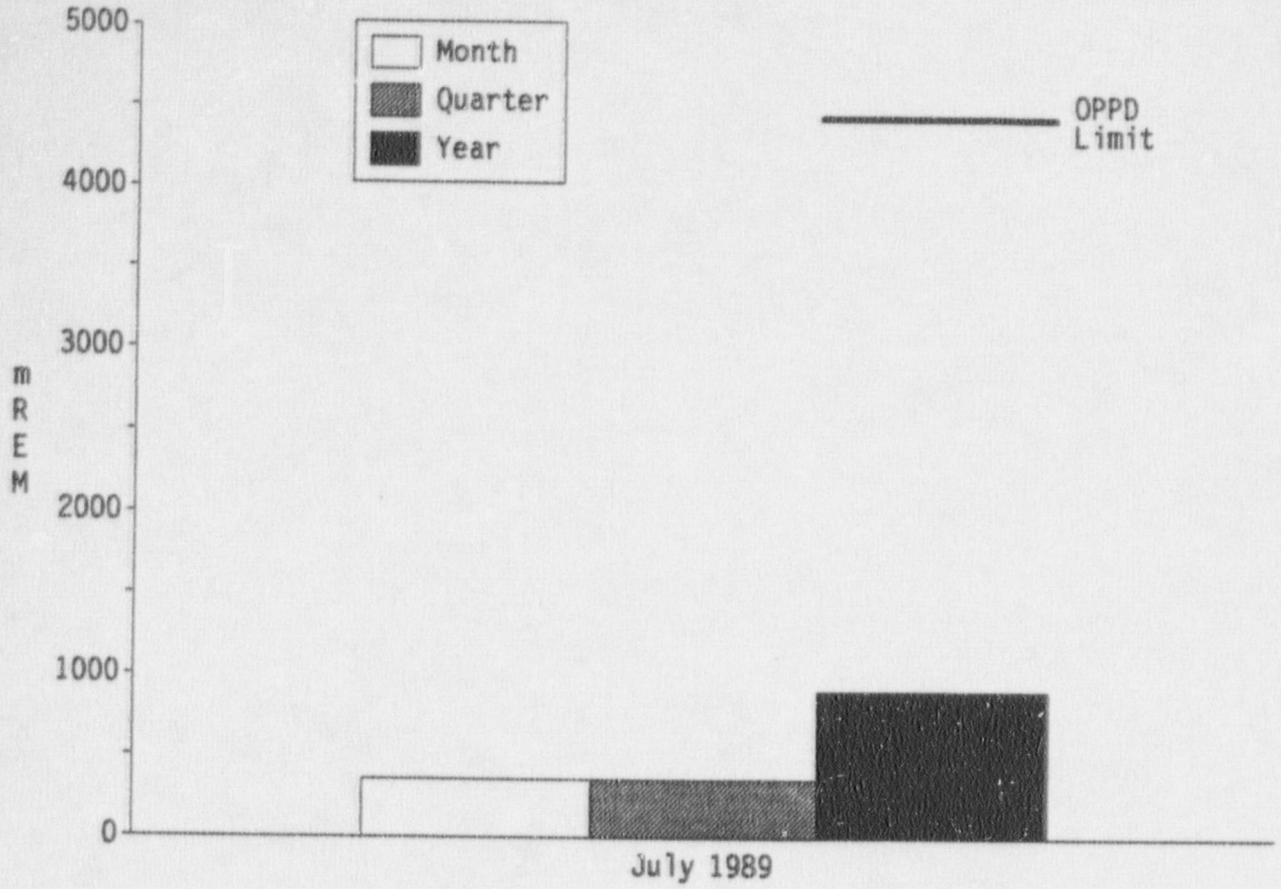
HAZARDOUS WASTE PRODUCED

The Hazardous Waste Produced Indicator has been added to the Fort Calhoun Station Performance Indicators Report for the month of August, 1989.

This indicator shows the amount of waste oil, non-halogenated hazardous waste, halogenated hazardous waste, and other hazardous waste produced by Fort Calhoun each month.

During the month of August, 207.0 kilograms of waste oil was produced, 0.0 kilograms of non-halogenated hazardous waste was produced, 358.9 kilograms of halogenated hazardous waste was produced, and 0.0 kilograms of other hazardous waste was produced.

Adverse Trend: None



MAXIMUM INDIVIDUAL RADIATION EXPOSURE

The Maximum Individual Radiation Exposure graph is one month behind the reporting period due to the lag time involved with collecting and calculating the radiation exposure for the station.

During July, 1989 an individual accumulated 357 mRem which was the highest individual exposure at the Fort Calhoun Station for the month.

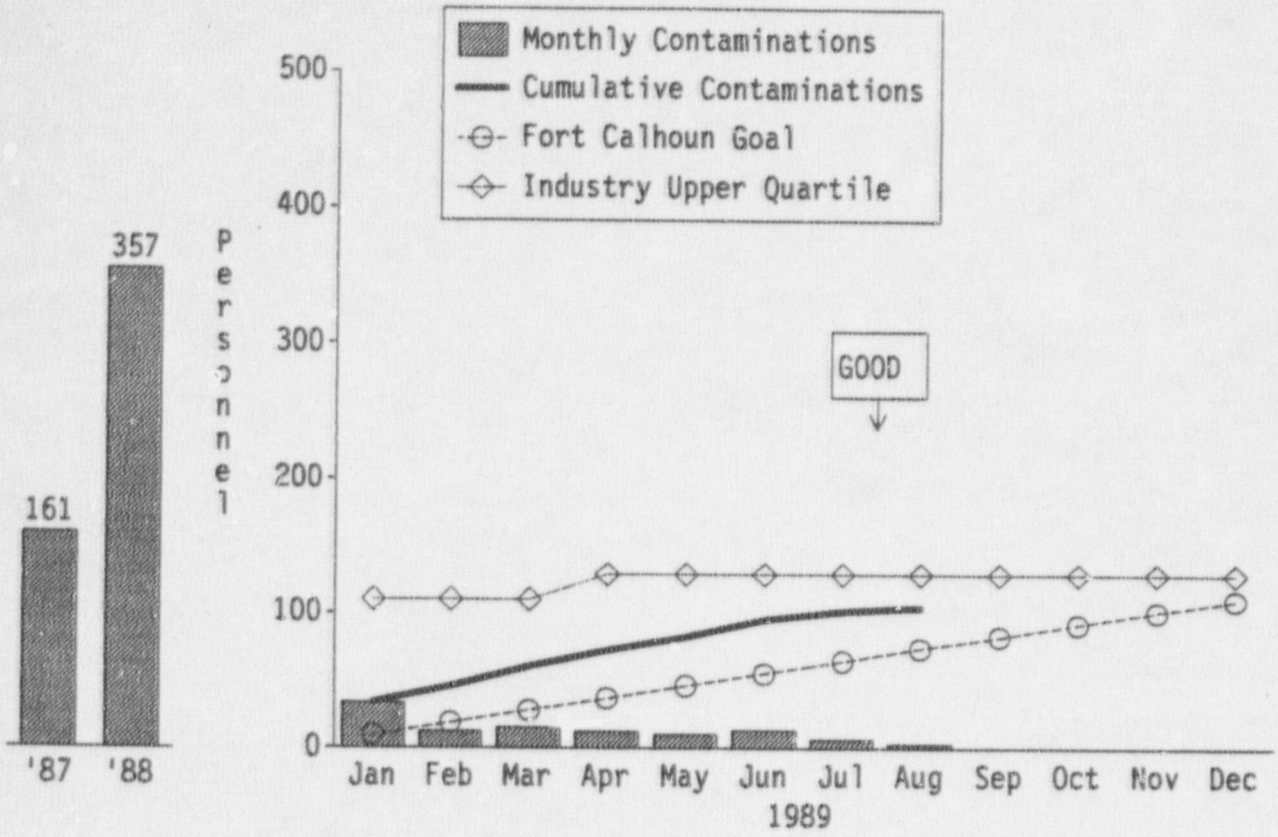
The maximum individual exposure so far for the third quarter of 1989 was 357 mRem.

The maximum individual exposure for the year so far was 907 mRem.

The maximum accumulated 1988 individual exposure was 2,371 mRem, received by a visiting contractor during the refueling outage.

The OPPD limit for the maximum yearly individual radiation exposure is 4,500 mRem/year.

Adverse Trend: None



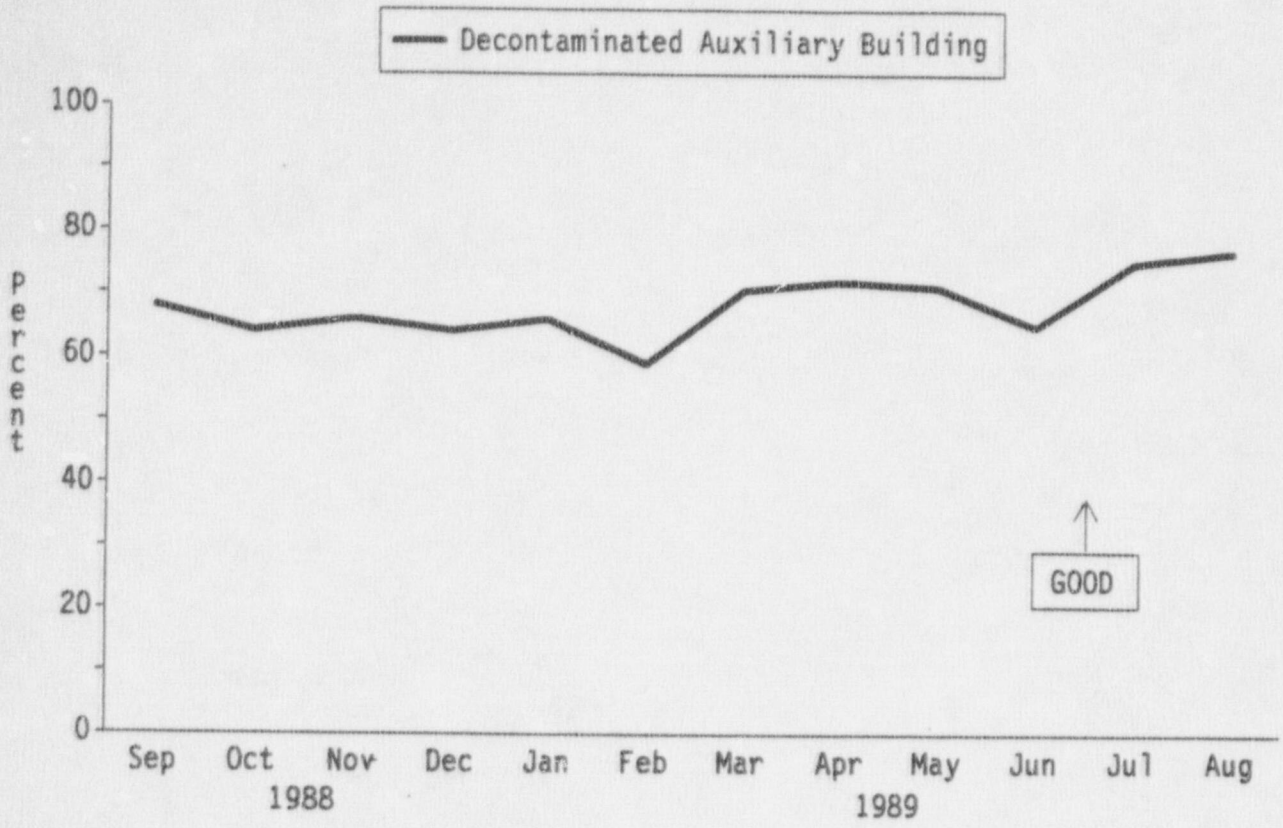
TOTAL SKIN AND CLOTHING CONTAMINATIONS

There was a total of 3 skin and clothing contaminations reported for the Fort Calhoun Station during August, 1989. These contaminations consisted of two clothing contaminations and one combination skin and clothing contamination.

There have been a total of 110 skin and clothing contaminations so far in 1989. The 1989 goal for skin and clothing is 110 contaminations.

The industry upper quartile value for total skin and clothing contaminations is 129 per unit annually.

Adverse Trend: None

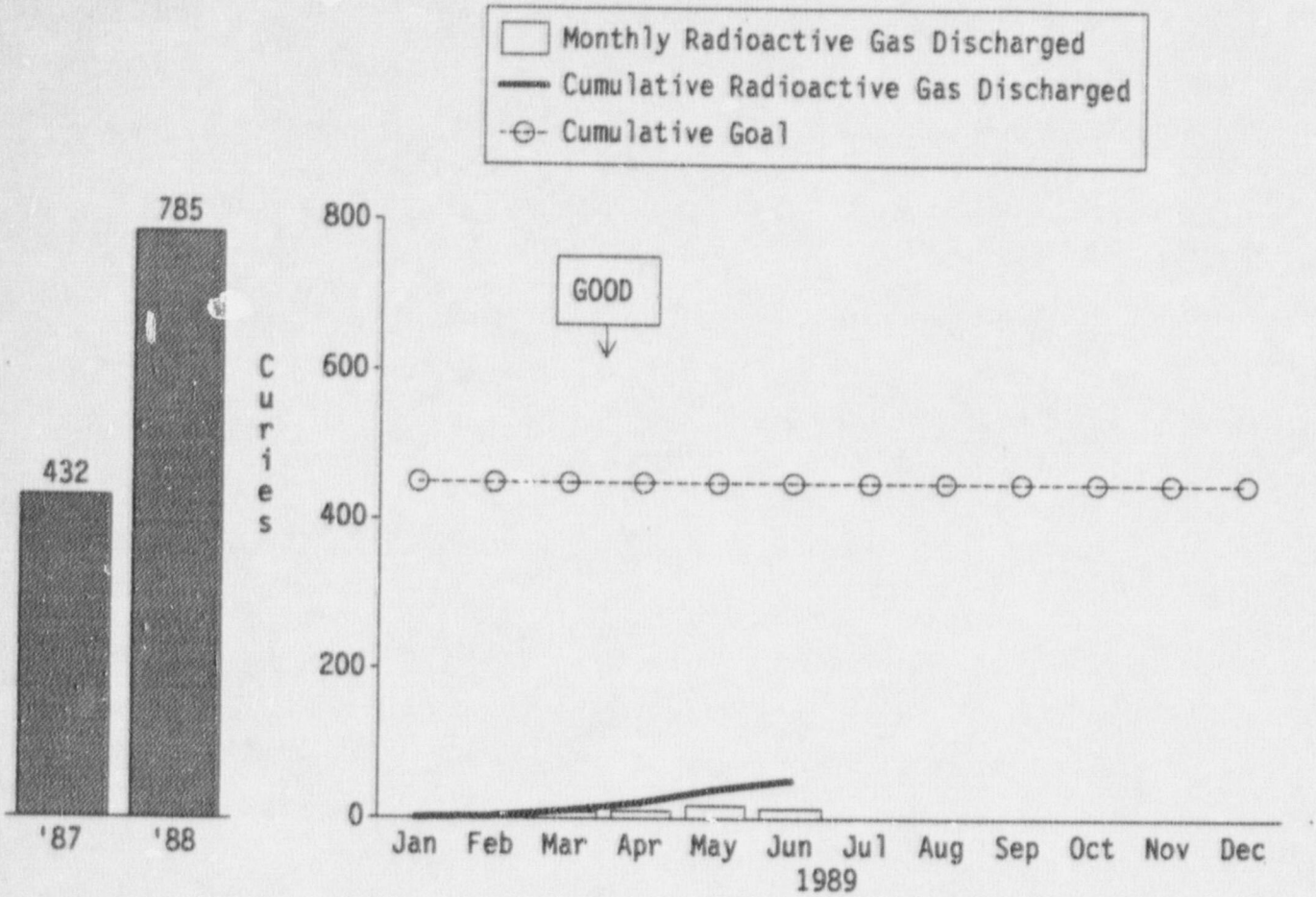


DECONTAMINATED AUXILIARY BUILDING

This graph shows the percentage of the auxiliary building which is decontaminated (clean) based on the total square footage.

As of August 31, 1989, 77.0% of the total square footage of the auxiliary building was decontaminated.

Adverse Trend: None

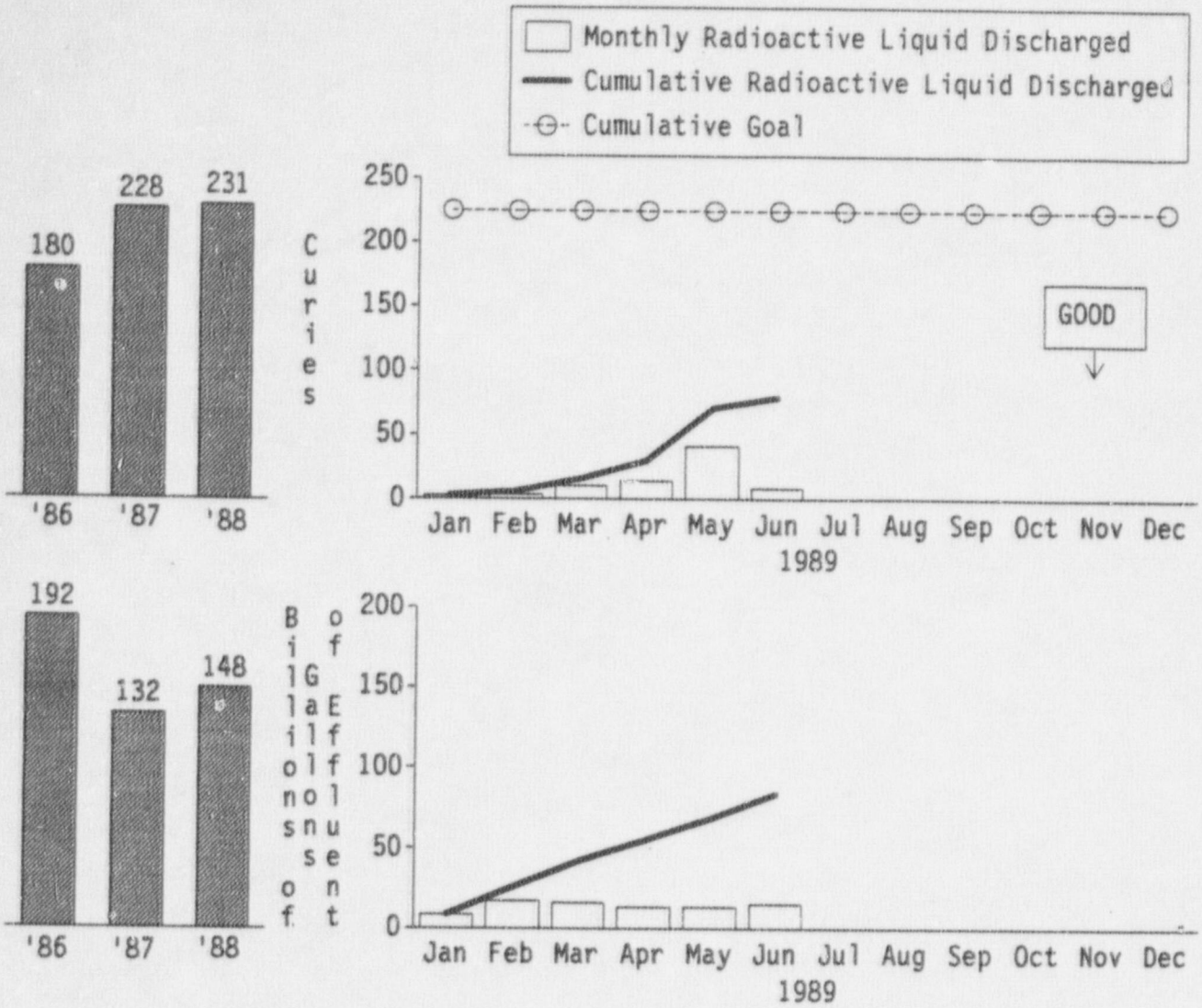


GASEOUS RADIOACTIVE WASTE BEING DISCHARGED TO THE ENVIRONMENT

The gaseous radioactive waste being discharged to the environment is shown for 1989. A total of 51.3 curies have been released to the environment from January through June of 1989. The Fort Calhoun Station goal is 450 curies for this indicator.

The gaseous radioactive waste being discharged to the environment is calculated every six months.

Adverse Trend: None



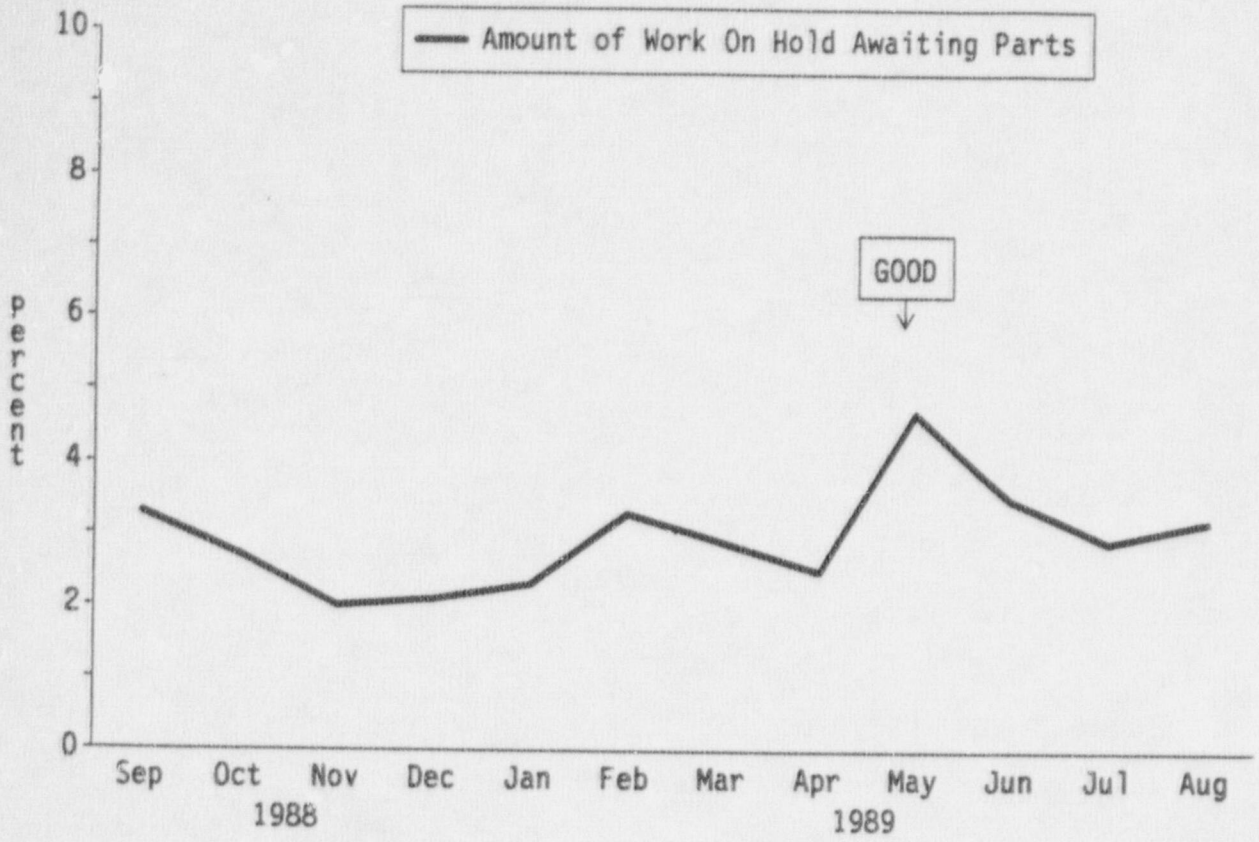
LIQUID RADIOACTIVE WASTE BEING DISCHARGED TO THE ENVIRONMENT

The liquid radioactive waste being discharged to the environment is shown for 1989. The liquid radioactive waste that was discharged to the environment totaled 78.8 curies and 83.7 billions of gallons of liquid effluent (radioactive liquid waste plus dilution water) from January through June 1989.

The high amount of waste that was discharged during the month of May was due to the dilution of coolant for the maintenance outage that occurred in May. The Fort Calhoun Station goal for 1989 is 225 curies.

The liquid radioactive waste being discharged to the environment is calculated every six months.

Adverse Trend: None



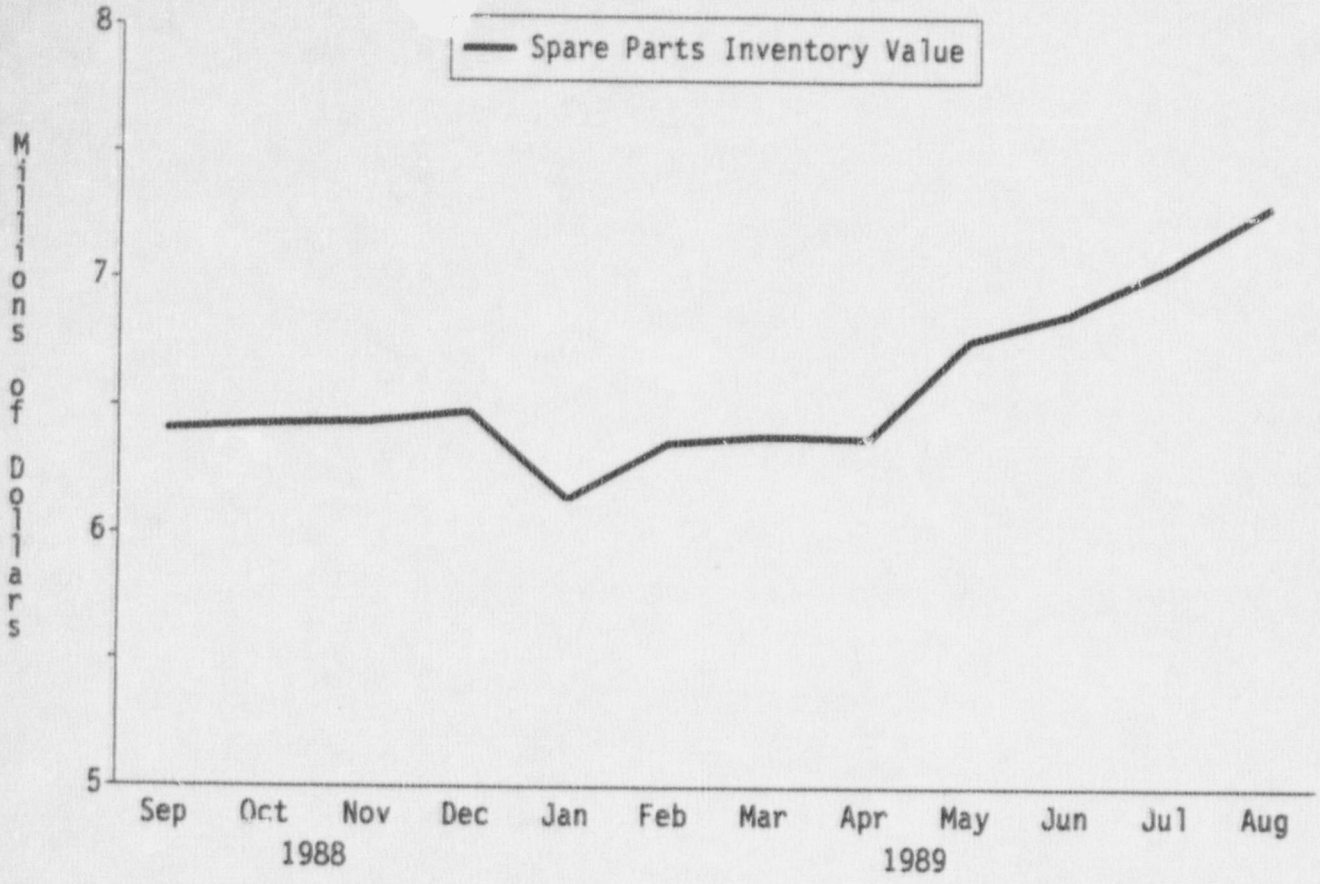
AMOUNT OF WORK ON HOLD AWAITING PARTS (NON-OUTAGE)

This procurement indicator displays the amount of open, non-outage, maintenance items that are on hold awaiting parts, to the total amount of open, non-outage, maintenance items, expressed as a percentage.

The percentage of work on hold awaiting parts increased to 3.2% in August.

As of August 31, 1989, there were a total of 1,358 open, non-outage, maintenance items with 43 of these items on hold awaiting parts.

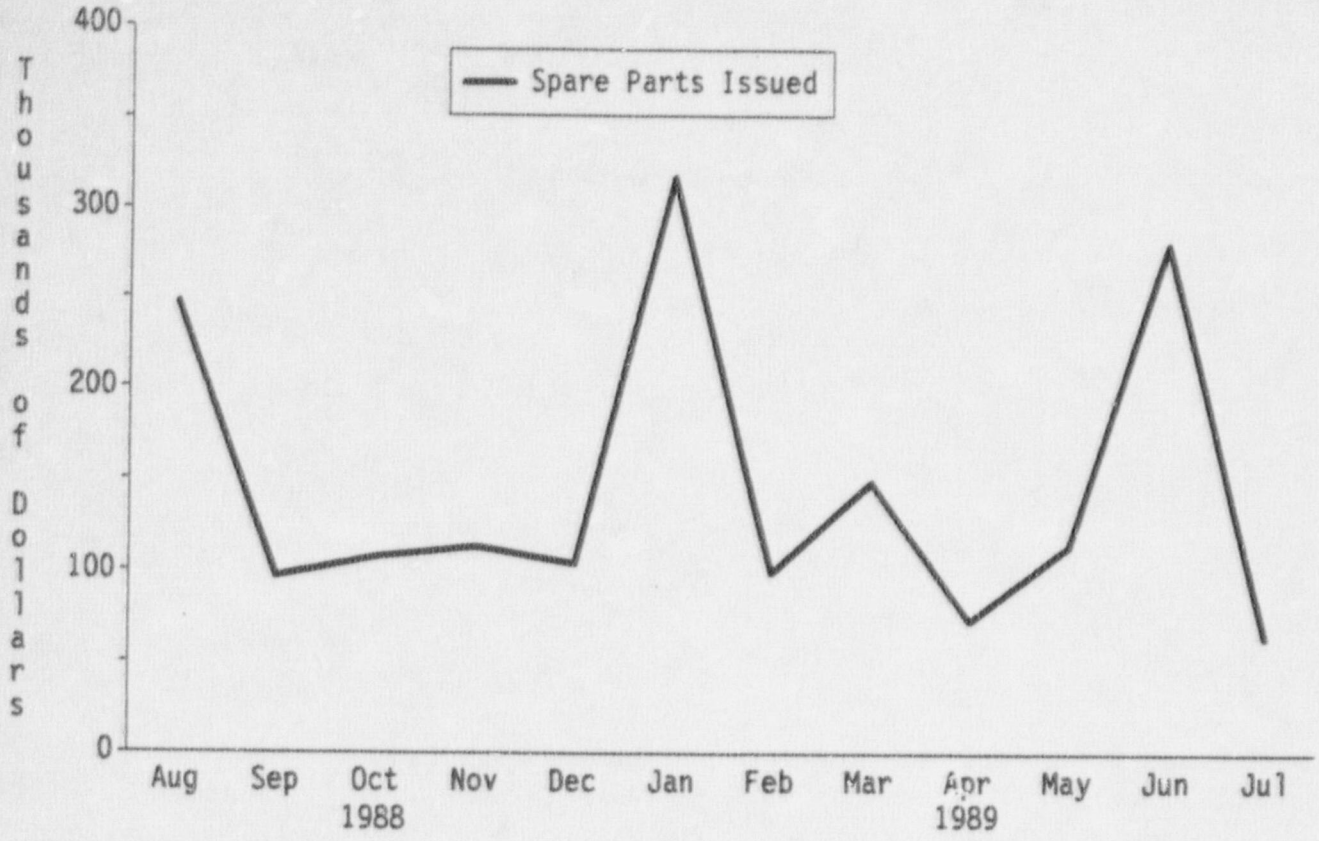
Adverse Trend: None



SPARE PARTS INVENTORY VALUE

The spare parts inventory value at the Fort Calhoun Station at the end of August, 1989 was reported as $7,296,726.

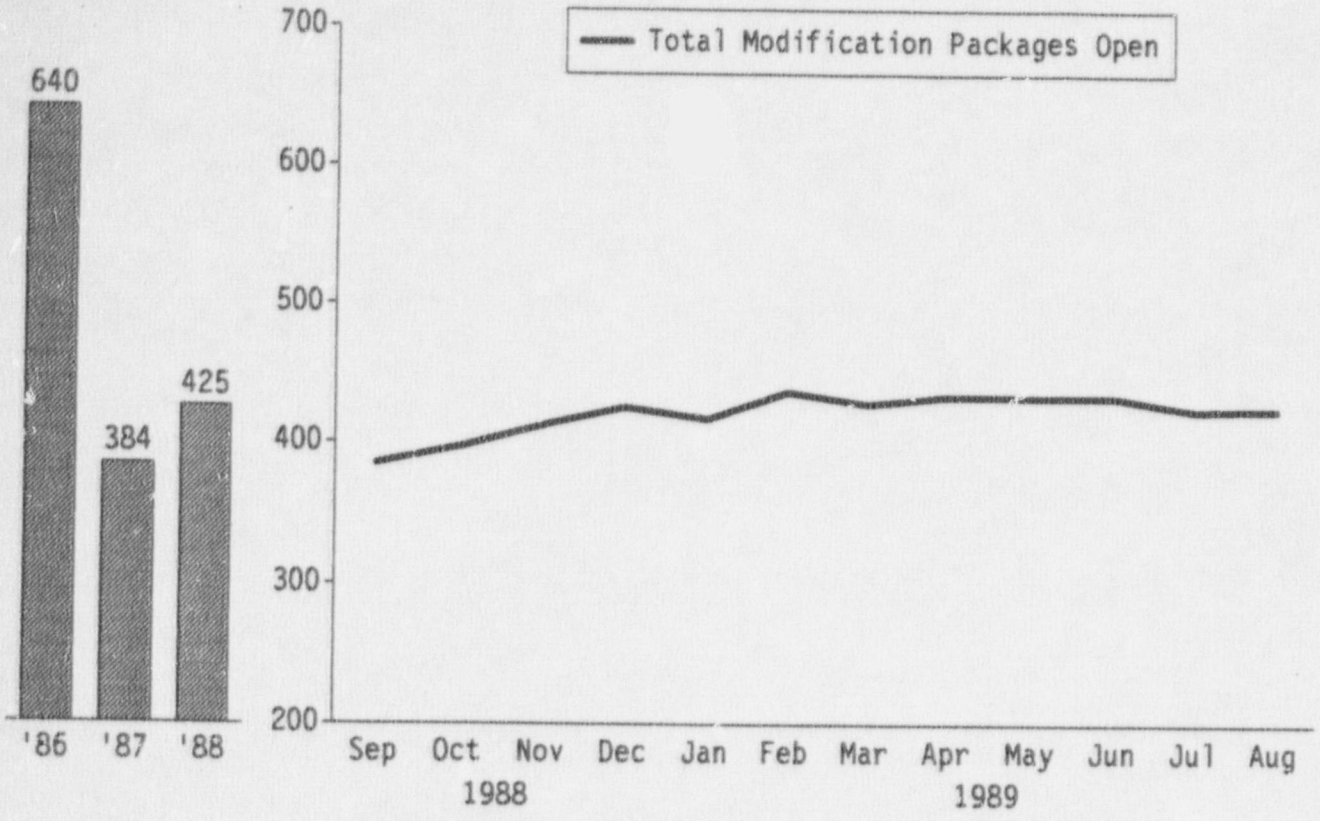
Adverse Trend: None



SPARE PARTS ISSUED

The value of the spare parts issued for the Fort Calhoun Station during August, 1989, was not available.

Adverse Trend: An adverse trend for this indicator is indeterminable due to the fact that the data for this indicator was not available for the month of August.

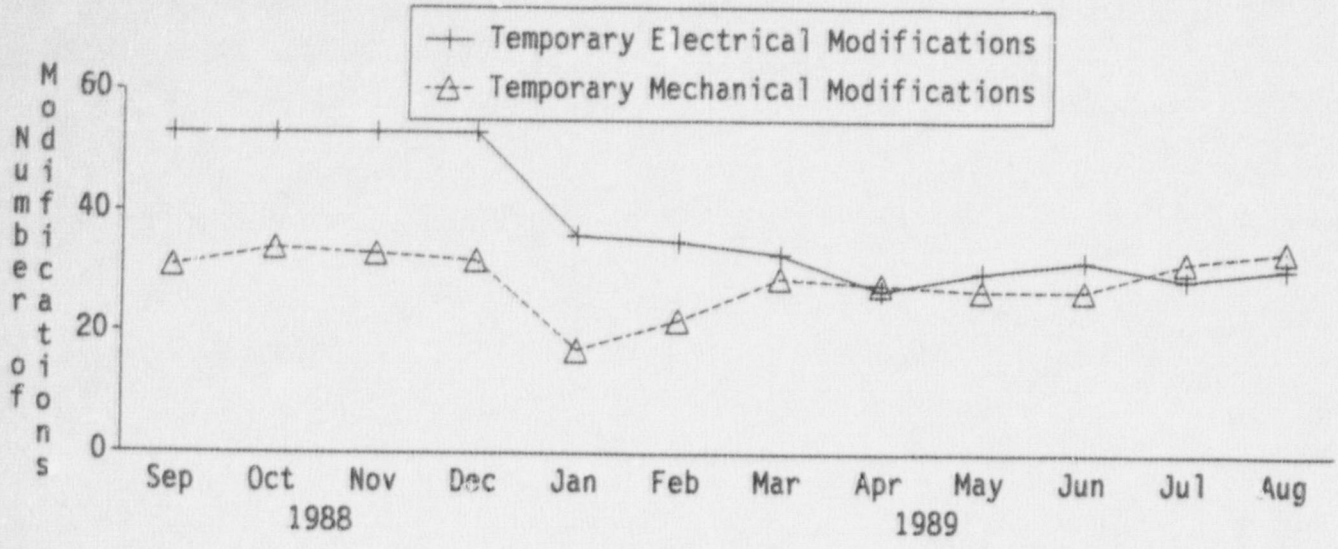


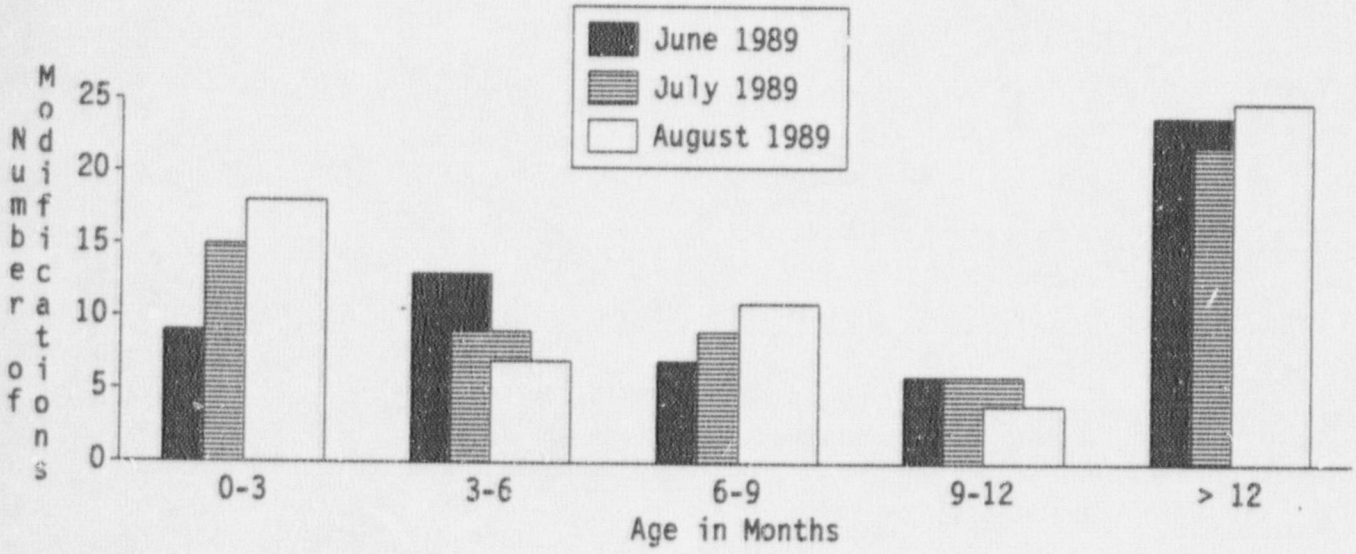
OUTSTANDING MODIFICATIONS

The total number of outstanding modifications increased by one during the month of August.

CATEGORY	JUN 89	JUL 89	AUG 89
Form FC-1133 Backlog/In Progress	103	93	89
Mod Requests Being Reviewed	173	170	169
Design Engr. Backlog	0	0	0
Design Engr. In Progress	70	72	73
Construction Backlog/In Progress	43	44	44
Design Engr. Update Backlog/In Progress	44	45	50
Total	433	424	425

Adverse Trend: None



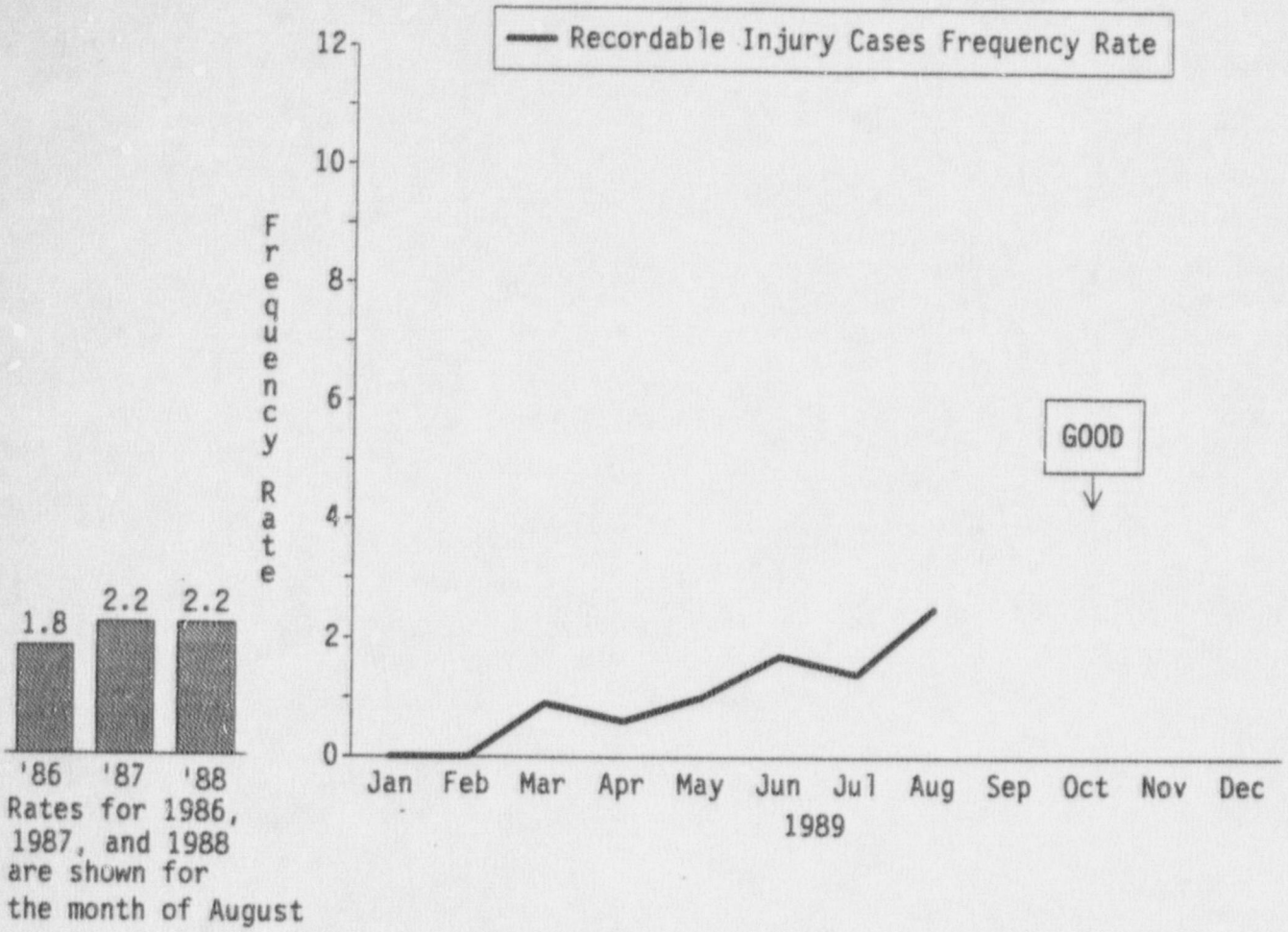


TEMPORARY MODIFICATIONS
(EXCLUDING SCAFFOLDING)

The top graph, Number of Temporary Modifications, displays a monthly trend of installed electrical and mechanical temporary modifications. There was a total of 31 electrical jumpers and 34 temporary mechanical jumpers existing in the Fort Calhoun Station at the end of August, 1989.

The bottom graph, Age of Temporary Modifications, displays the age of all electrical and mechanical temporary modifications by months installed in the plant.

Adverse Trend: Even though the number of temporary mechanical modifications has been increasing since June, the total number of temporary modifications is expected to decrease. The decrease in the number of temporary modifications is expected due to greater awareness and control of the number and types of temporary modifications currently in the plant. New procedures, such as GEI-60, are also being established to decrease the number of temporary modifications.



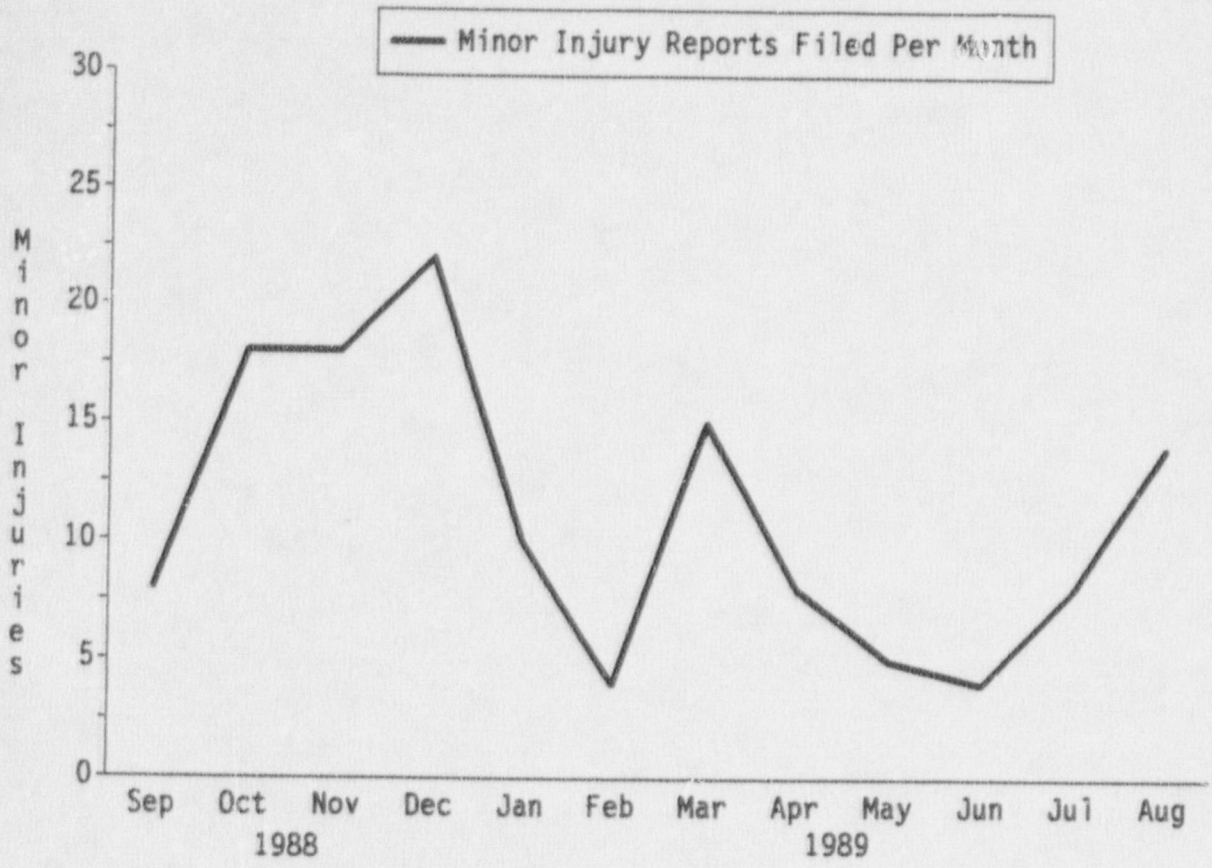
RECORDABLE INJURY CASES FREQUENCY RATE

A recordable injury case is reported if Nuclear Production Division personnel are injured on the job and require corrective medical treatment. The recordable cases frequency rate is computed on a year-to-date basis.

There were 4 recordable injury cases reported for the month of August. There have been a total of 8 recordable injury cases so far in 1989. The 4 recordable injury cases reported during August raised the Recordable Injury Frequency Rate from 1.4 in July to 2.5 in August.

There were eleven recordable cases reported in 1988, eight reported in 1987, and four reported in 1986.

Adverse Trend: The recordable injury frequency rate for the Fort Calhoun Station was reported as 2.5 for the month of August. The increasing frequency rate is due to 8 recordable injury cases that have been reported in 1989. One recordable injury occurred in March, one recordable injury occurred in May, two recordable injuries occurred in June, and four recordable injuries occurred in August.

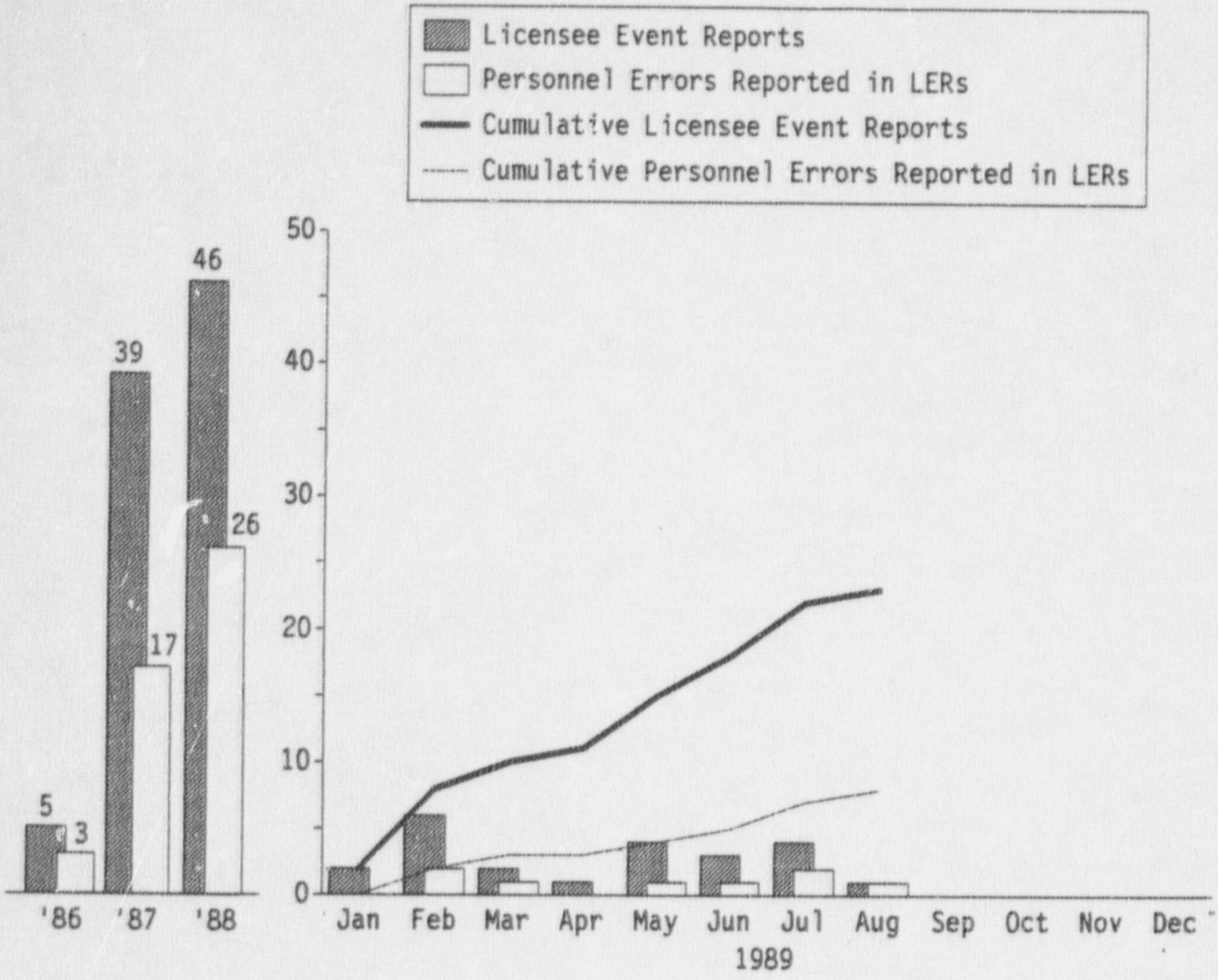


MINOR INJURY CASES PER MONTH

The Minor Injury Cases per Month indicator shows the number of minor injury cases each month involving OPPD employees.

During the month of August, 1989 there were a total of 14 minor injury cases reported. There have been a total of 68 minor injury cases reported in 1989.

Adverse Trend: The number of minor injuries have increased from 4 reported in June to 8 reported in July and 14 reported in August.



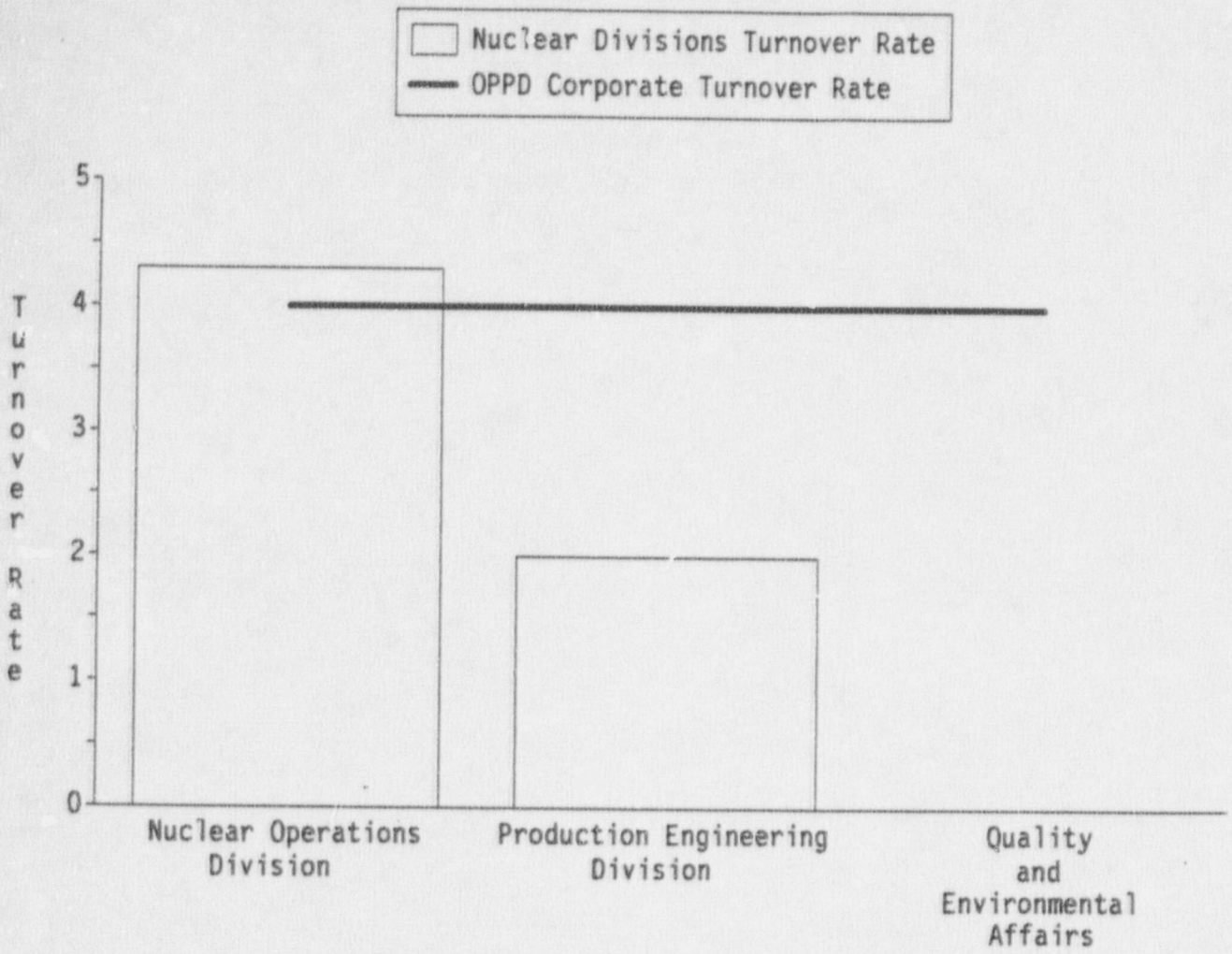
NUMBER OF PERSONNEL ERRORS
REPORTED IN LER'S

The Licensee Event Reports (LERs) are reported for the month that they are submitted to the NRC.

In August, 1989 there was one LER submitted. This LER was attributable to personnel error.

There have been 23 LERs reported so far in 1989 with only 8 attributable to personnel errors.

Adverse Trend: None

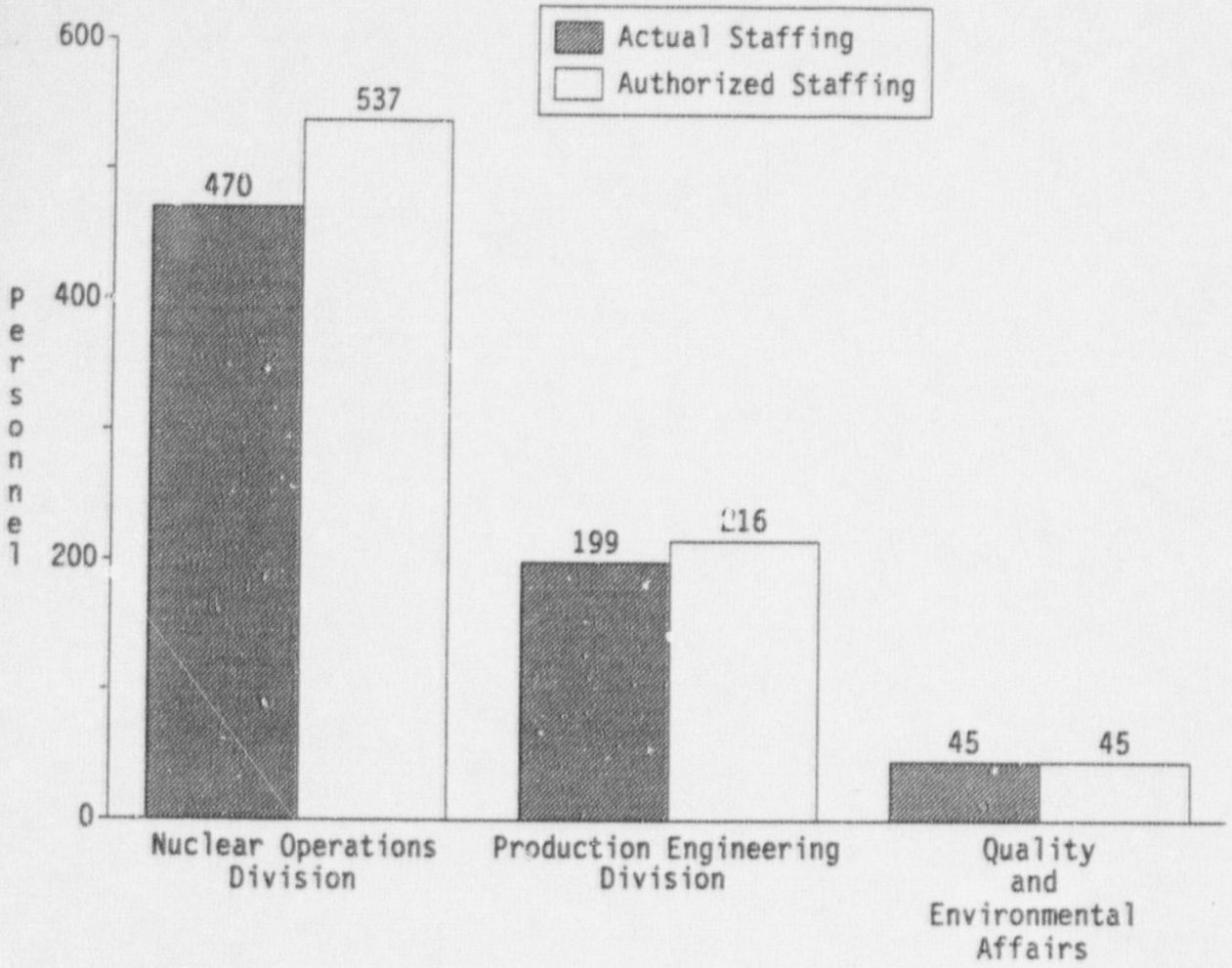


PERSONNEL TURNOVER RATE

The turnover rate for three Nuclear Divisions is shown for the last twelve months.

The personnel turnover rate is plotted against the OPPD corporate turnover rate of 4.0%. This OPPD corporate turnover rate is based on the turnover rate over the last three years.

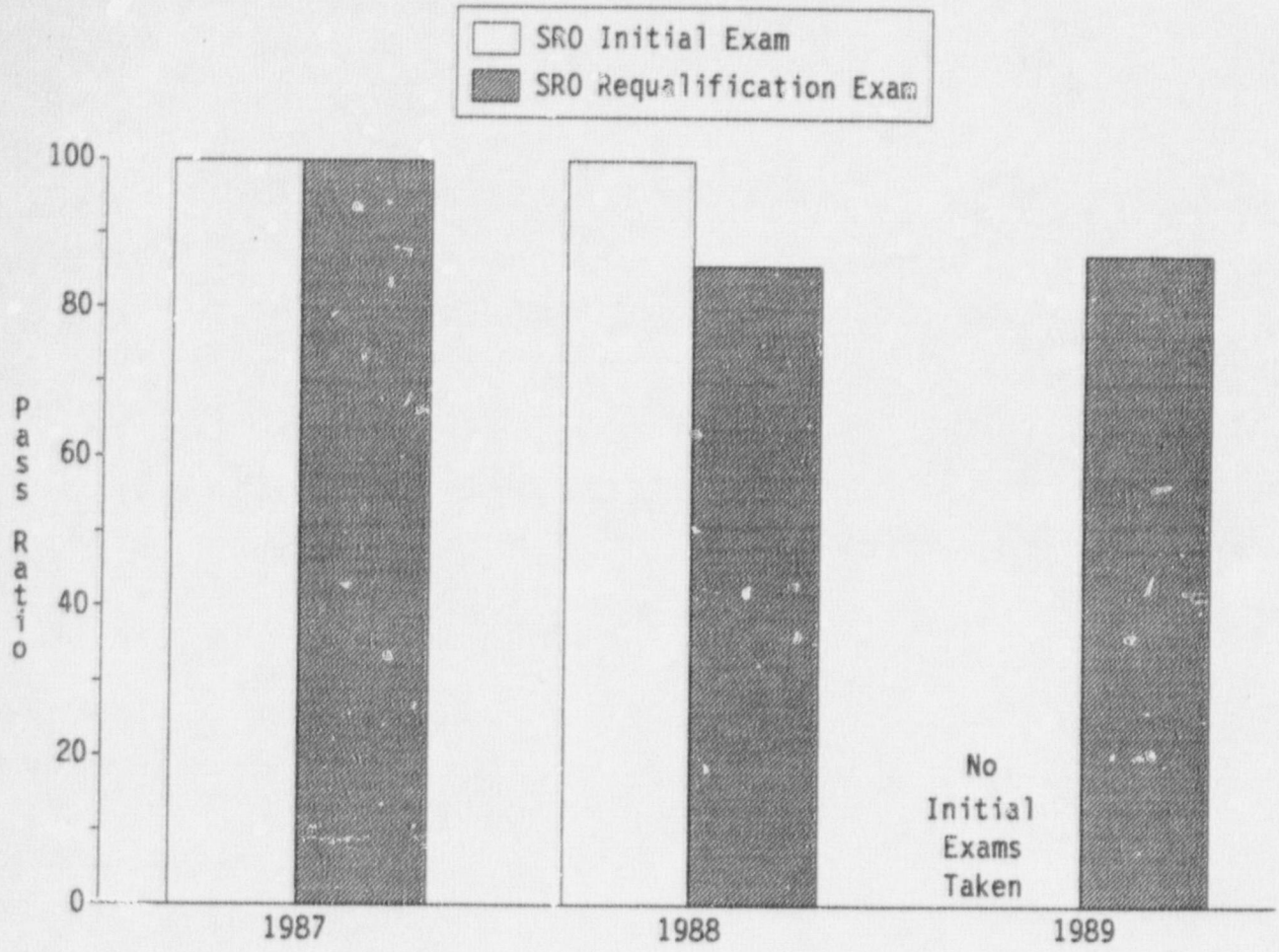
Adverse Trend: None



STAFFING LEVEL

The authorized and actual staffing levels are shown for the three Nuclear Divisions.

Adverse Trend: None

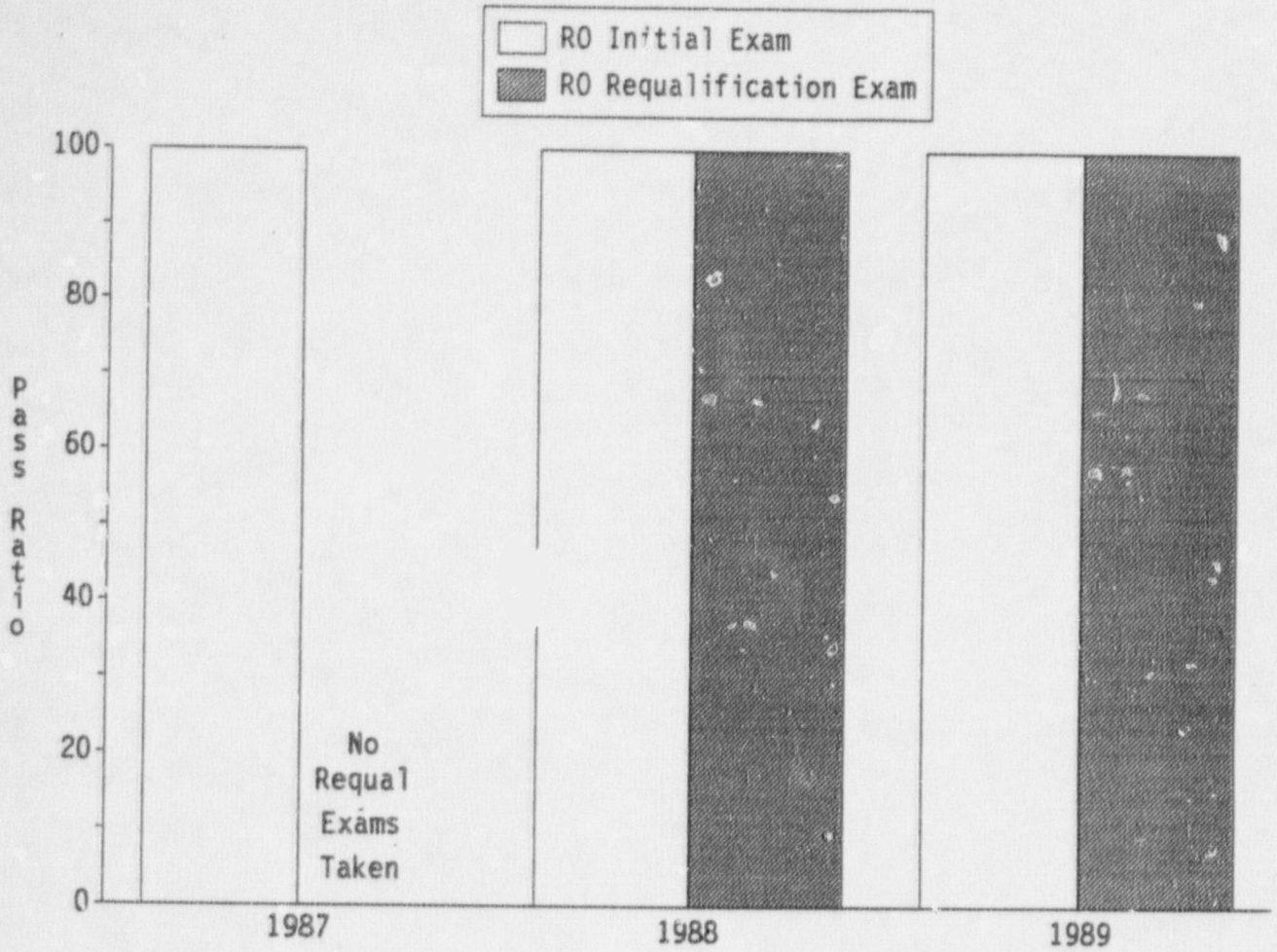


SRO LICENSE EXAMINATION PASS RATIO

There were zero Senior Reactor Operator (SRO) exams taken in August.

	OPPD ADMINISTERED		NRC ADMINISTERED	
	Initial Exam	Requal Exam	Initial Exam	Requal Exam
DATE	% PASS RATIO	% PASS RATIO	% PASS RATIO	% PASS RATIO
March 87	-	-	100	100
June 87	-	-	-	100
February 88	-	80	-	-
March 88	-	100	100	67
April 88	-	100	-	-
July 88	-	-	100	-
April 89	-	-	-	67
May 89	-	100	-	-

Adverse Trend: None

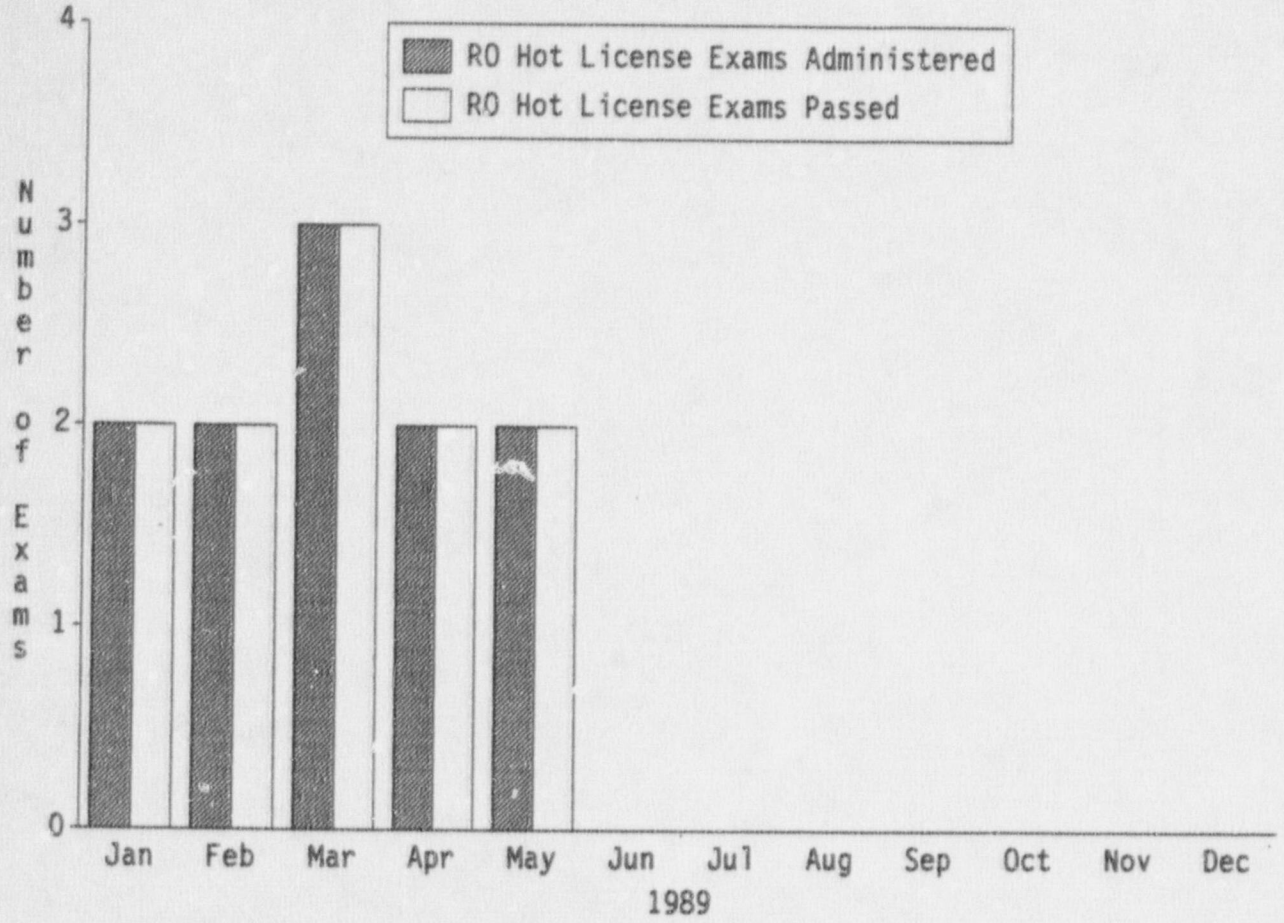


RO LICENSE EXAMINATION PASS RATIO

There were zero Reactor Operator (RO) exams taken in August.

	OPPD ADMINISTERED		NRC ADMINISTERED	
DATE	Initial Exam % PASS RATIO	Requal Exam % PASS RATIO	Initial Exam % PASS RATIO	Requal Exam % PASS RATIO
June 87	-	-	100	-
February 88	-	100	-	-
March 88	-	100	100	100
July 88	-	-	100	-
April 89	-	-	100	100
May 89	-	100	-	-

Adverse Trend: None

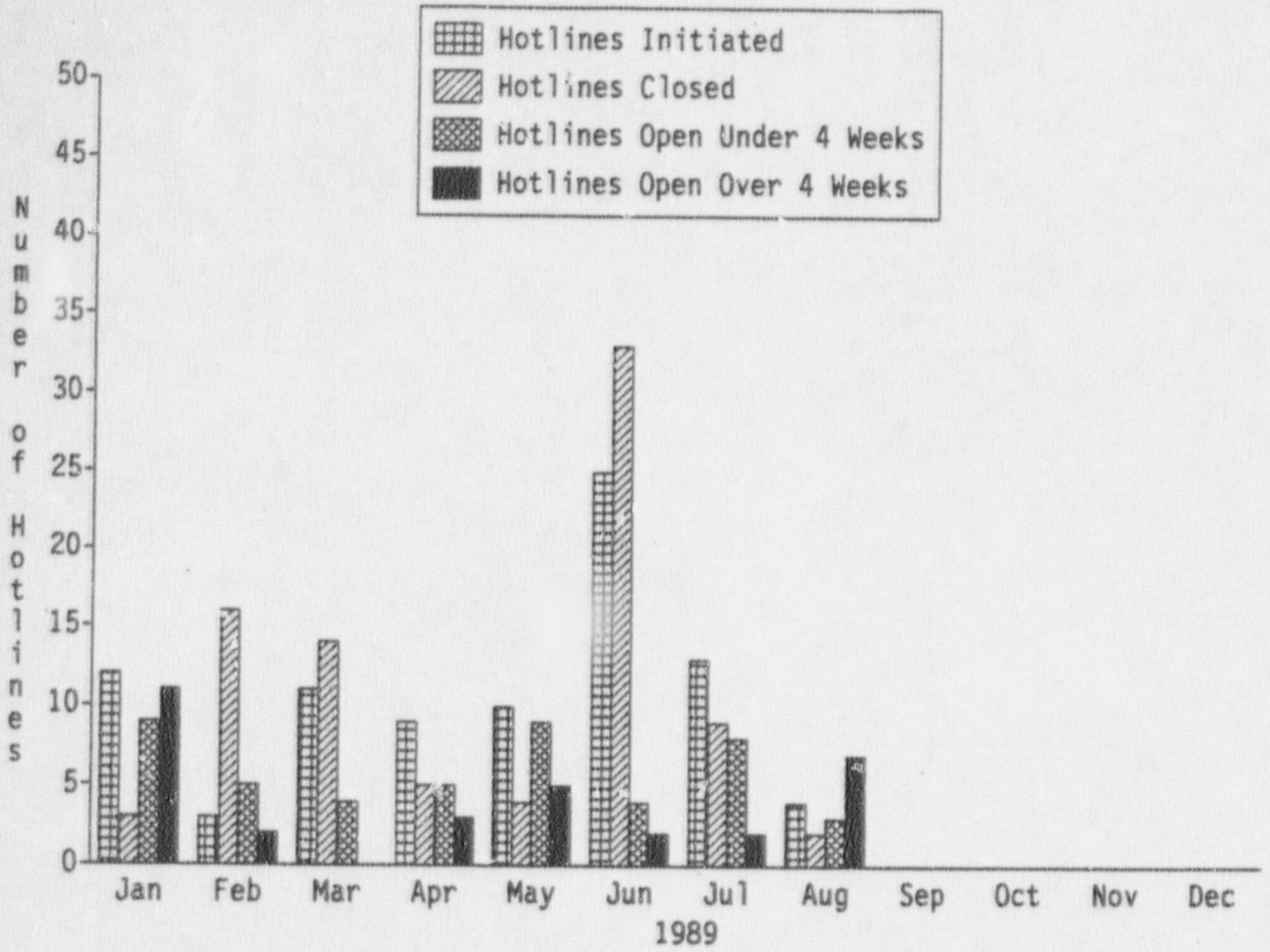


RO HOT LICENSE EXAMS

The RO Hot License Exams indicator shows the number of RO Hot License exams or quizzes taken and passed each month.

During the month of August, 1989, zero exams were administered.

Adverse Trend: None

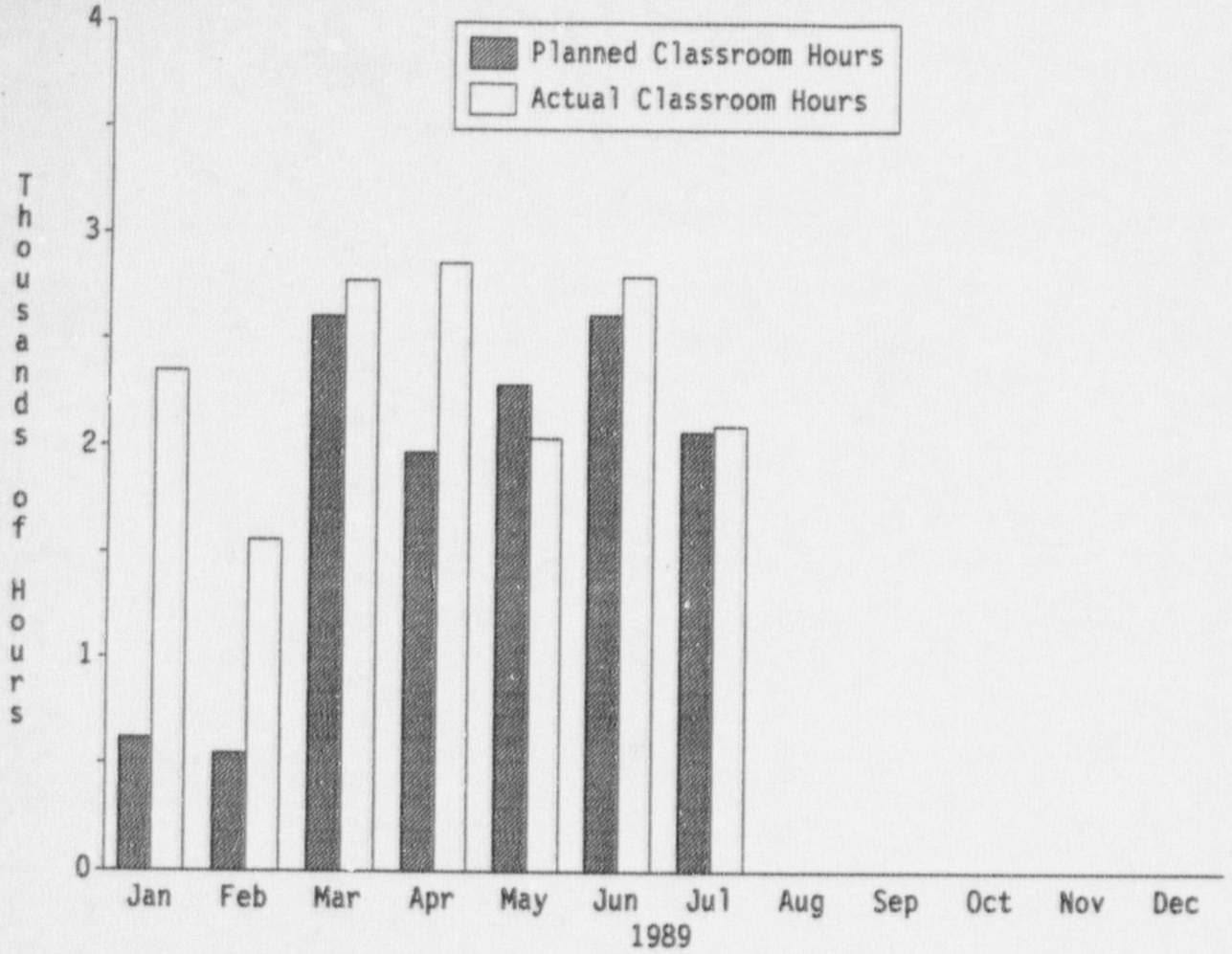


HOTLINES

This indicator was changed for the month of June, 1989. This indicator now shows the number of Hotlines initiated, the number of Hotlines closed, the number of Hotlines that remain open and are less than four weeks old, and the number of Hotlines that remain open and are older than four weeks old.

During the month of August, 1989, there were 4 Hotlines initiated, 2 Hotlines closed, 3 Hotlines that remained open and were less than four weeks old, and 7 Hotlines that remained open and were older than four weeks old.

Adverse Trend: The increase of open Hotlines was due to the reopening of previously closed Hotlines.



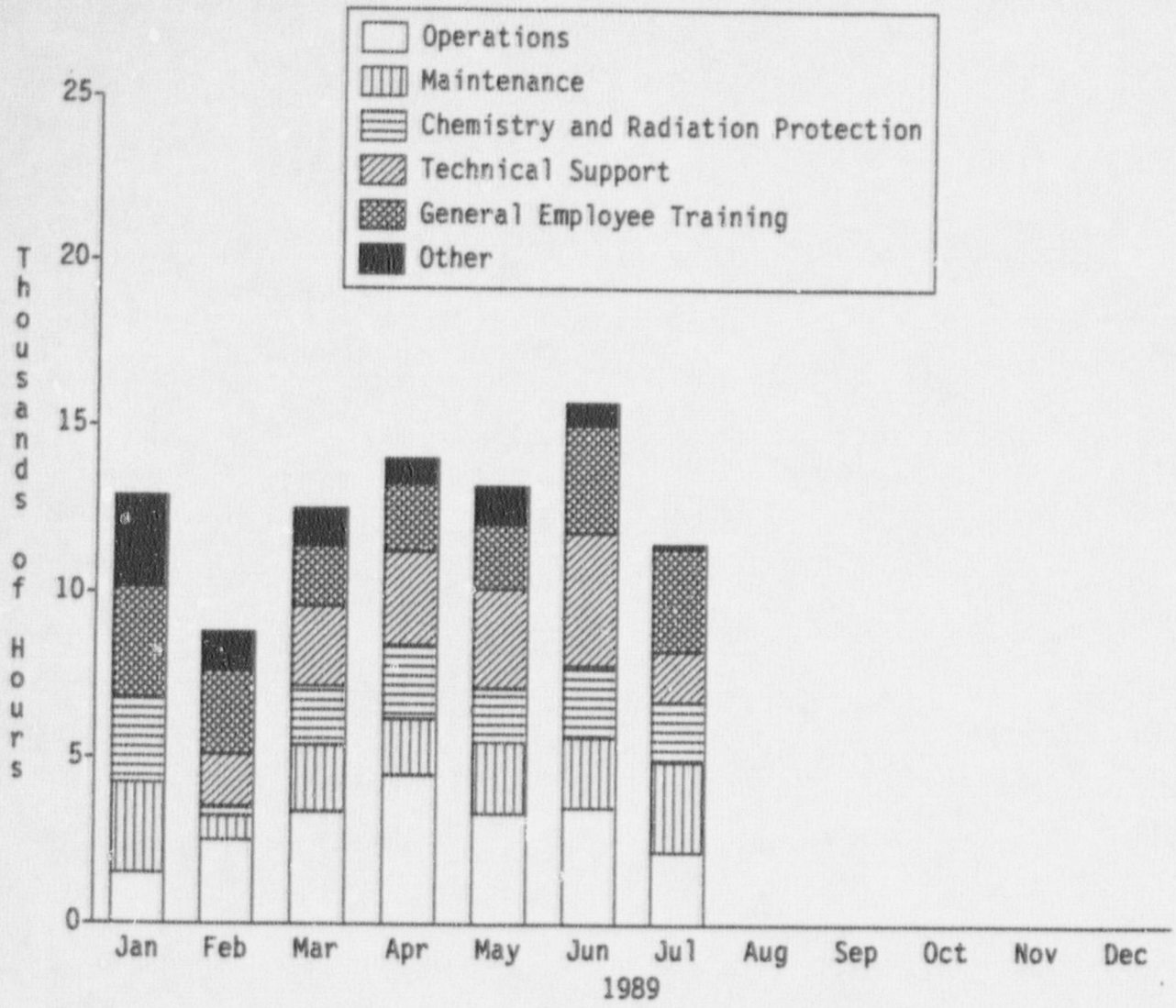
CLASSROOM (INSTRUCTOR) HOURS

This indicator displays the number of planned classroom hours and the number of actual classroom hours for the Fort Calhoun Station.

The planned classroom hours for January and February are low because Maintenance and General Employee Training were not figured into the schedule for these months.

This indicator is one month behind the reporting month due to the time to collect and process the needed information.

Adverse Trend: None



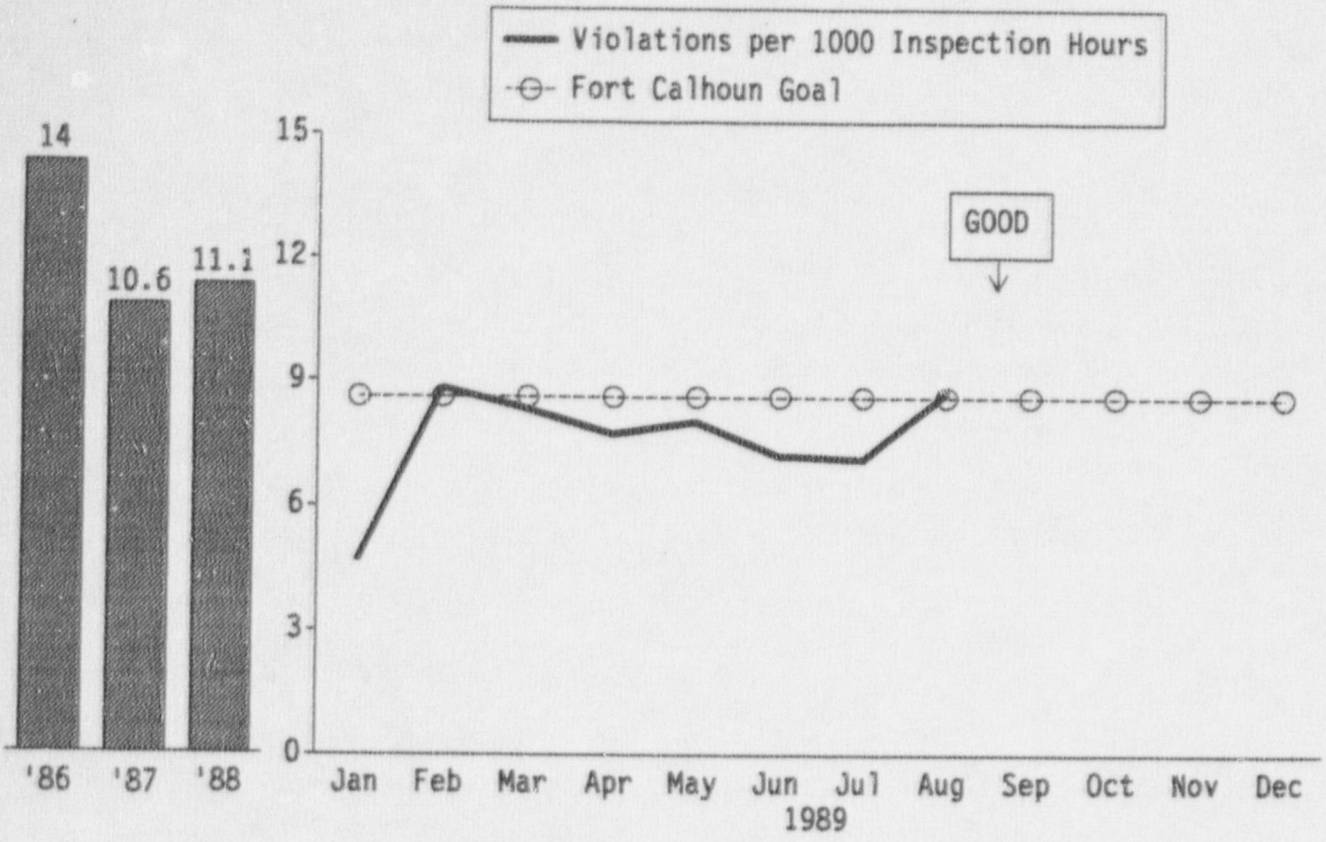
TOTAL HOURS OF STUDENT TRAINING

This indicator shows the total number of student hours for Operations, Maintenance, Chemistry and Radiation Protection, Technical Support, General Employee Training, and Other training conducted for the Fort Calhoun Station.

This indicator is one month behind the reporting month due to the time needed to collect and evaluate the data.

	Total Hours	
TRAINING	JUNE 1989	JULY 1989
Operations	3,530	2,184
Maintenance	2,130	2,753
Chemistry and Radiation Protection	2,167	1,820
Technical Support	4,003	1,543
General Employee Training	3,200	3,094
Other	675	122
Total	15,705	11,516

Adverse Trend: None



VIOLATIONS PER 1000 INSPECTION HOURS

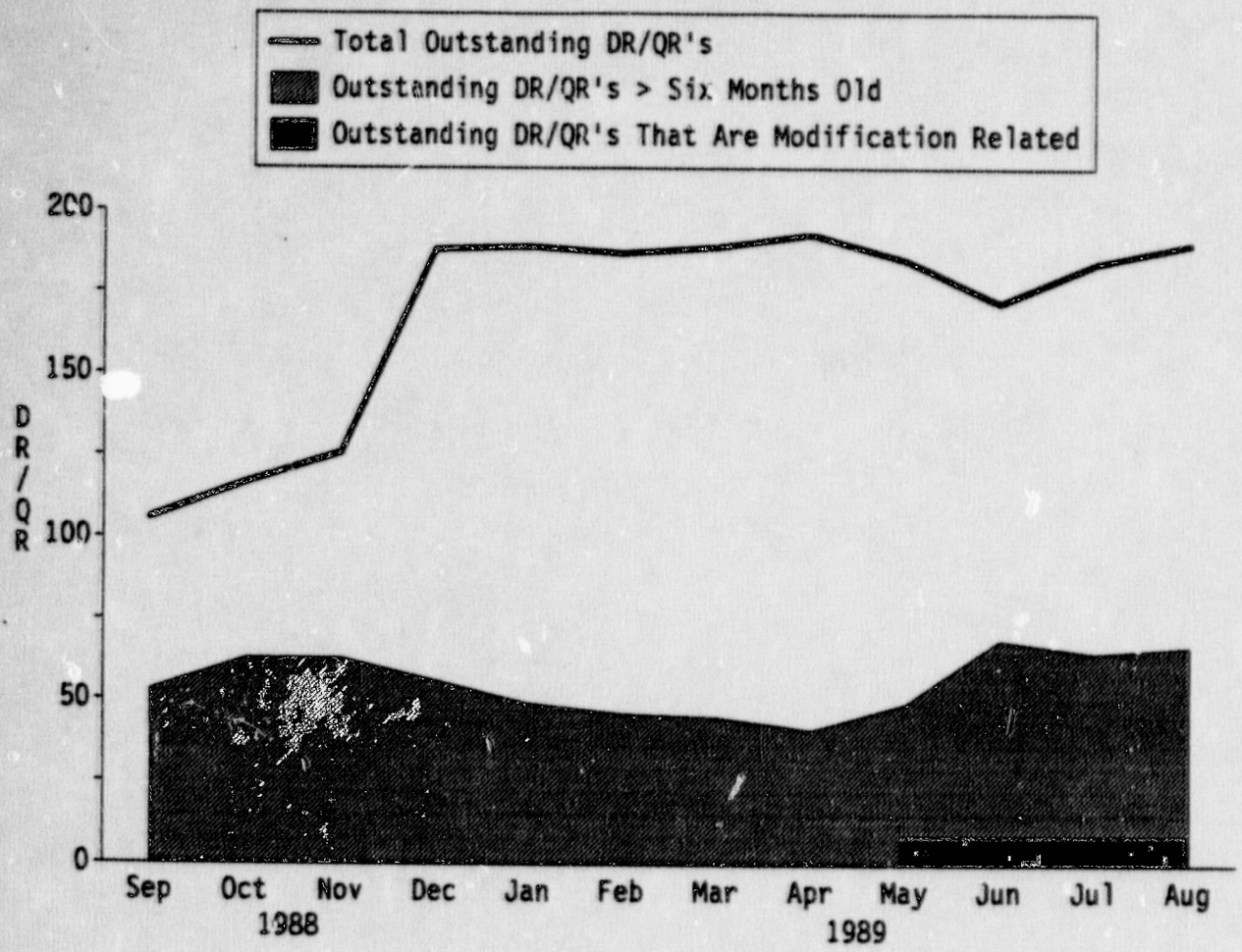
This indicator displays the number of NRC violations cited in inspection reports per 1000 NRC inspection hours. This indicator was calculated using the number of violations and the number of inspection hours from the months of December, 1988, through August, 1989.

The violations per 1000 inspection hours indicator was reported as 8.7 for the month of August, 1989.

There were three violations cited in one inspection report for the month of August. There have been a total of 21 violations cited with 2,184 inspection hours in 1989.

The goal for the number of violations per 1000 inspection hours is less than 8.6.

Adverse Trend: The violations per 1000 inspection hours has increased due to 3 violations found in 30 inspection hours for the month of August.



OUTSTANDING DEFICIENCY AND QUALITY REPORTS

The Outstanding Deficiency and Quality Reports Indicator was changed for the month of May, 1989. This indicator now shows outstanding Deficiency and Quality reports that are associated with modifications.

As of the end of August, 1989 there were 190 outstanding DR/QR's reports, 67 DR/QR's that are greater than six months old, and 9 DR/QR's that are modification related.

Adverse Trend: None

SALP FUNCTIONAL AREA	1988 OPPD DR/QR	1988 SIGNIFICANT DR/QR	1988 NRC VIOLATIONS	1988 LER'S	1989 OPPD DR/QR	1989 SIGNIFICANT DR/QR	1989 NRC VIOLATIONS	1989 LER'S
A. Plant Operations	38	1	8	11	2	0	7	0
B. Radiological Controls	53	0	5	1	22 (3)	1	1	1
C. Maintenance/ Surveillance	58	2	3	16	98 (8)	2	1	9
D. Emergency Preparedness	11	0	0	1	8	0	0	0
E. Security	49	0	10	11	13	0	5 (3)	7 (1)
F. Engineering/ Technical Support	30	1	2	3	55 (22)	2 (2)	6	5
G. Safety Assessment/ Quality Verification	110	0	10	3	59 (8)	0	1	0
H. Other	0	0	0	0	0	0	0	1
Total	349	4	38	46	257 (41)	5 (2)	21 (3)	23 (1)

DR/QR'S ISSUED VERSUS SIGNIFICANT DR/QR'S VERSUS NRC VIOLATIONS ISSUED VERSUS LER'S REPORTED

This indicator was changed for the month of July, 1989. The above matrix now shows the number of Deficiency Reports (DR's) and Quality Reports (QR's) issued by the Quality Assurance and Regulatory Affairs Division versus the number of Significant DR/QR's issued by the Quality Assurance and Regulatory Affairs Division versus the number of violations issued by the Nuclear Regulatory Commission (NRC) for the Fort Calhoun Station in 1988 and 1989. Included in this table is the number of Licensee Event Reports (LER's) issued by the station each year.

Significant DR/QR's are conditions or characteristics which indicate areas which are repeatedly identified, widespread noncompliance(s), conditions outside of the design basis, and conditions that would endanger the health and welfare of the public.

In August, 1989, there were 41 DR/QR's issued, 2 Significant DR/QR's issued, 3 NRC violations, and one LER issued. The monthly distribution of DR/QR's, Significant DR/QR's, NRC violations, and LER's are shown in parentheses.

ESCALATED ENFORCEMENT HISTORY

Escalated enforcement includes level III, II, and I violations issued by the Nuclear Regulatory Commission for deficiencies discovered at the Fort Calhoun Station. Escalated enforcement also includes civil penalties which are usually assessed with level III and higher violations. Listed below is the escalated enforcement history for the Fort Calhoun Station.

ESCALATED ENFORCEMENT

1. February 1985 — Site Security - Multiple Level IV and V Violations that were escalated to a Level III.
   A civil penalty of $21,425 was assessed.

2. April 1986 — Qualification of Electrical Penetrations - Level III Violation.
   No civil penalty was assessed.

3. May 1986 — Radiological Protection - Level III Violation.
   No civil penalty was assessed.

4. December 1986 — Physical Security - Level IV Violation.
   A civil penalty of $15,000 was assessed.

5. January 1987 — Lack of Adequate Safety Evaluation for Emergency Modification - Level III Violation.
   A civil penalty of $50,000 was assessed.

6. January 1988 — Unlocked High Radiation Doors and Lack of Health Physics Coverage to Very High Radiation Areas - Level III Violation.
   A civil penalty of $75,000 was assessed.

7. February 1988 — Design Evaluation, Design Implementation and Classification/Reporting, and Corrective Action of Water Intrusion into the Instrument Air System - 3 Level III Violations.
   A civil penalty of $175,000 was assessed.

8. May 1988 — Unlocked Very High Radiation Door and deficiencies identified in the Radiological Protection Program - 2 Level III Violations.
   A civil penalty of $112,500 was assessed.

ESCALATED ENFORCEMENT HISTORY (CONTINUED)

ESCALATED ENFORCEMENT

9. October 1988	A missing cap on a 3/8 inch containment line, SIRWT check valve test failures, and Safety Analysis for Operability - Level III violation. A civil penalty of $50,000 was assessed.
10. October 1988	Errors in Cycle 11 Setpoint Analysis and incorrect information submitted in a response. No civil penalty was assessed.

ENFORCEMENT CONFERENCES AND MANAGEMENT MEETINGS

Enforcement conferences are held with the NRC on potential higher level violations. Listed below are the recent enforcement conferences and management meetings held with the NRC.

RECENT ENFORCEMENT CONFERENCES AND MANAGEMENT MEETINGS

1. August 1988 — Two management meetings were held with the NRC in August. One meeting was held to discuss the security program while another meeting was held on the OPPD independent appraisal results.

2. October 1988 — Two management meetings were held with the NRC in October. One meeting was held concerning the security program while another meeting was held to discuss the training program and the radiation protection program.

3. November 1988 — Two management meetings were held with the NRC in November. One meeting was held concerning the Safety Enhancement Program while another was held to discuss Decay Heat Removal.

4. January 1989 — One management meeting was held with the NRC in January. This meeting was held concerning the new Site Security Plan.

5. February 1989 — One Enforcement Conference was held with the NRC in February. This Enforcement Conference was held concerning the Radiological Protection Program.

6. February 1989 — One management meeting was held with the NRC in February. This management meeting was held concerning the Safety Enhancement Program.

7. April 1989 — One management meeting was held with the NRC in April. This management meeting was held concerning the Safety Enhancement Program.

8. May 1989 — One management meeting was held with the NRC in May. This management meeting was held concerning the Safety Enhancement Program.

9. July 1989 — One Enforcement Conference was held with the NRC in July. This Enforcement Conference was held concerning auxiliary feedwater pump FW-10 controller operability.

10. August 1989 — One Enforcement Conference was held with the NRC in August. This Enforcement Conference was held concerning various security problems.

SIGNIFICANT ITEMS OF INTEREST

This section is intended to provide information on events which are significant to the Fort Calhoun Station and will give a "heads-up" look at what is scheduled in the coming months.

- The Fort Calhoun Station went critical on January 29, 1989 at 9:27 a.m.
- The Fort Calhoun Station went on-line on January 31, 1989 at 4:46 p.m.
- The 1990 refueling outage is scheduled for February, 15, 1990.
- The 1990 INPO Plant Assessment is scheduled to start on June 18, 1990.

AGE OF OUTSTANDING MAINTENANCE WORK ORDERS

This indicator tracks the total number of outstanding Maintenance Work Orders at the Fort Calhoun Station versus their age in months.

AMOUNT OF WORK ON HOLD AWAITING PARTS

This indicator is defined as the percentage of open, non-outage, maintenance work orders that are on hold awaiting parts, to the total number of open, non-outage, maintenance work orders.

AUXILIARY SYSTEMS CHEMISTRY HOURS OUTSIDE STATION LIMITS

The cumulative hours that the Component Cooling Water system is outside the station chemistry limit. The hours are accumulated from the first sample exceeding the limit until additional sampling shows the parameter to be back within limits.

CLASSROOM (INSTRUCTOR) HOURS

The number of planned classroom hours and the number of actual classroom hours for the Fort Calhoun Station.

CORRECTIVE MAINTENANCE BACKLOG GREATER THAN 3 MONTHS OLD

The percentage of total outstanding maintenance items, not requiring an outage, that are greater than three months old at the end of the period reported.

CRAFT WORK ACTIVITY

The percentage of a type of work performed by each craft during the reported month involving plant personnel.

DAILY THERMAL OUTPUT

The daily core thermal output as measured from computer point XC105 in thermal megawatts.

DIESEL GENERATOR RELIABILITY

A Diesel Generator (DG) unit consists of the engine, generator, combustion air system, cooling water system, fuel supply system, lubricating oil system, starting air system, autostart controls, manual controls, and diesel generator breaker.

Reliability of each DG unit will be reported for two situations, one for the last 20 demands and one for the last 100 demands. Reliability is the ratio of the number of successful runs to the number of demands, for each individual DG unit.

DIESEL GENERATOR RELIABILITY (CONTINUED)

A successful run is defined as a start of a DG unit and the loading of this unit to a minimum of 50% rated load (1250 KW) for a minimum time period of 60 minutes.

A failure is defined as the failure to start, accelerate, and assume the design rated load for the given time period as specified for an emergency or a valid test.

The total number of demands (or valid tests) will be equal to the sum of the failures and the successful runs.

This definition of DG Reliability was taken from the U.S. Nuclear Regulatory Commission "Regulatory Guide 1.108, Revision 1". This is the definition being applied in calculating the diesel generator reliability at the Fort Calhoun Station.

DISABLING INJURY FREQUENCY RATE (LOST TIME ACCIDENT RATE)

This indicator is defined as the number of accidents for all utility personnel permanently assigned to the station, involving days away from work per 200,000 man-hours worked (100 man-years). This does not include contractor personnel.

DOCUMENT REVIEW

The Document Review Indicator shows the number of documents reviewed during the reporting month, the number of documents scheduled for review during the reporting month, and the number of document reviews that are overdue.

EQUIPMENT FORCED OUTAGES PER 1000 CRITICAL HOURS

Equipment forced outages per 1000 critical hours 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 (1000 hours) divided by the number of forced outages caused by equipment failures in that period.

EQUIVALENT AVAILABILITY FACTOR

This indicator is defined as the ratio of gross available generation to gross maximum generation, expressed as a percentage. Available generation is the energy that can be produced if the unit is operated at the maximum power level permitted by equipment and regulatory limitations. Maximum generation is the energy that can be produced by a unit in a given period if operated continuously at maximum capacity.

FORCED OUTAGE RATE

This indicator is defined as the percentage of time that the unit was unavailable due to forced events compared to the time planned for electrical generation. Forced events are failures or other unplanned conditions that require removing the unit from service before the end of the next weekend. Forced events include startup failures and events initiated while the unit is in reserve shutdown (i.e., the unit is available but not in service.

FUEL RELIABILITY INDICATOR

This indicator is defined as the steady-state primary coolant I-131 activity, corrected for the tramp uranium contribution and normalized to a common purification rate.

Tramp uranium is fuel which has been deposited on reactor core internals from previous defective fuel or is present on the surface of fuel elements from the manufacturing process.

Steady state is defined as continuous operations above 85 percent power for at least seven days.

GASEOUS RADIOACTIVE WASTE BEING DISCHARGED TO THE ENVIRONMENT

This indicator displays the total number of Curies of all gaseous radioactive nuclides released from the Fort Calhoun Station.

GROSS HEAT RATE

Gross heat rate is defined as the ratio of total thermal energy in British Thermal Units (BTU) produced by the reactor to the total gross electrical energy produced by the generator in kilowatt-hours (KWH).

HAZARDOUS WASTE PRODUCED

The amount (in Kilograms) of waste oil, non-halogenated hazardous waste, halogenated hazardous waste, and other hazardous waste produced by the Fort Calhoun Station each month.

HOTLINES

The number of Hotlines that are initiated, closed, overdue, and open for a given month. A Hotline is a training document sent out for immediate review. The Hotline should be reviewed and signed within 5 days of receipt of the Hotline.

HOURS CHEMISTRY IS OUTSIDE OWNERS GROUP GUIDELINES

Total hours for 13 secondary side chemistry parameters exceeding guidelines during power operation. Power operation is defined as greater than 30% power. The 13 parameters tracked are steam generator pH, cation conductivity, boron silica, chloride, sulfate, sodium, feed water pH, dissolved oxygen, hydrazine, iron, copper, and condensate pump discharge dissolved oxygen.

IN-LINE CHEMISTRY INSTRUMENTS OUT-OF-SERVICE

Total number of in-line chemistry instruments that are out-of-service in the Secondary System and the Post Accident Sampling System (PASS).

LIQUID RADIOACTIVE WASTE BEING DISCHARGED TO THE ENVIRONMENT

This indicator displays both the total volume of liquid effluent (radioactive liquid waste plus dilution water) and the associated Curies discharged from the Fort Calhoun Station to the Missouri River.

MAINTENANCE WORK ORDER BACKLOG

The number of corrective non-outage maintenance work orders that remain open at the end of the reporting month. This indicator was added to the Performance Indicators Report to trend open corrective non-outage maintenance work orders as stated in Safety Enhancement Program (SEP) Item No. 36.

MAINTENANCE WORK ORDER BREAKDOWN

This indicator is a breakdown of all open maintenance work orders by several categories.

MAINTENANCE OVERTIME

The percentage of overtime hours compared to normal hours for maintenance. This includes OPPD personnel as well as contract personnel.

MAXIMUM INDIVIDUAL RADIATION EXPOSURE

The total maximum amount of Gamma and Neutron (Whole Body) radiation received by an individual person working at the Fort Calhoun Station on a monthly, quarterly, and annual basis.

MINOR INJURY CASES PER MONTH

The number of minor injury cases (short-form cases) involving OPPD employees.

NUMBER OF NUCLEAR PLANT RELIABILITY DATA SYSTEM (NPRDS) FAILURE REPORTS SUBMITTED

The data plotted is the number of suspected and confirmed NPRDS component failures. The suspected NPRDS failures are designated as such on the applicable equipment Maintenance Work Order.

NPRDS is the Nuclear Plant Reliability Data System, and is a utility industry users group program which has been outlined by INPO and implemented at the Fort Calhoun Station.

NUMBER OF OUT-OF-SERVICE CONTROL ROOM INSTRUMENTS

A control room instrument that cannot perform its design function is considered as out-of-service. A control room instrument which has had a Maintenance Work Order (MWO) written for it and has not been repaired by the end of the reporting period is considered out-of-service and will be counted. The duration of the out-of-service condition is not considered.

Computer CRTs are not considered as control room instruments.

NUMBER OF PERSONNEL ERRORS REPORTED IN LER'S

The number of Licensee Event Reports (LERs) attributed to personnel error on the original LER submittal.

NUMBER OF VIOLATIONS PER 1000 INSPECTION HOURS

This indicator is defined as the number of violations sited in NRC inspection reports for the Fort Calhoun Station per 1000 NRC inspection hours. The violations are reported in the year that the inspection was actually performed and not based on when the inspection report is received. The hours reported for each inspection report are used as the inspection hours.

OPERATIONS AND MAINTENANCE BUDGET

The year to date budget compared to the actual expenditures for operations and maintenance.

OUTSTANDING MODIFICATIONS

The number of authorized Modification Requests (MR'S) in any state between the issuance of a Modification Number and the completion of the drawing update.

Form FC-1133 Backlog/In Progress

The Form FC-1133 has not been approved.

OUTSTANDING MODIFICATIONS (CONTINUED)

Modification Requests Being Reviewed

Nuclear Planning is reviewing these Modification Requests and will assign a year for construction to be completed or will submit an approval for cancellation.

Design Engineering Backlog

Nuclear Planning has assigned a year in which construction will be completed but PED has not started design work.

Design Engineering in Progress

PED has assigned a year in which construction will be completed and design work is in progress.

Construction Backlog/In Progress

The Construction Package has been issued or construction has begun but the modification has not been accepted by the System Acceptance Committee (SAC).

Design Engineering Update Backlog/In Progress

PED has received the Modification Completion Report but the drawings have not been updated.

PERCENT OF DR/QR'S GREATER THAN SIX MONTHS OLD

This indicator displays the percentage of Deficiency Reports (DR's) and Quality Reports (QR's) that are greater than six months old.

PERSONNEL RADIATION EXPOSURE (CUMULATIVE)

Collective radiation exposure is the total external whole-body dose received by all on-site personnel (including contractors and visitors) during a time period, as measured by the thermoluminescent dosimeter (TLD). Collective radiation exposure is reported in units of man-rem.

PERSONNEL TURNOVER RATE

The ratio of the number of turnovers to average employment. A turnover is a vacancy created by voluntary resignation from the company. Retirement, death, termination, transfers within the company, and part-time employees are not considered in turnover.

PREVENTIVE MAINTENANCE ITEMS OVERDUE

This indicator is defined as the percentage of preventive maintenance items in the month that were not completed by the scheduled date plus a grace period equal to 25 percent of the scheduled interval.

PRIMARY SYSTEM CHEMISTRY - PERCENT OF HOURS OUT OF LIMIT

The percent of hours out of limit are for six primary chemistry parameters divided by the total number of hours possible for the month. The key parameters used are: Lithium, Chloride, Hydrogen, Dissolved Oxygen, Fluoride, and Suspended Solids. EPRI limits are used.

PROCEDURAL NONCOMPLIANCE INCIDENTS (MAINTENANCE)

The number of identified incidents, the number of opened incidents, and the number of closed incidents each month involving maintenance.

RATIO OF HIGHEST PRIORITY MWO'S TO TOTAL MWO'S COMPLETED

This indicator is defined as the ratio of the number of highest priority, non-outage, corrective maintenance work orders (priority 4 or 5) to the total number of non-outage, corrective maintenance work orders completed, expressed as a percentage.

RATIO OF PREVENTIVE TO TOTAL MAINTENANCE

The ratio of preventive maintenance (including surveillance testing and calibration procedures) to the sum of non-outage corrective maintenance and preventive maintenance completed over the reporting period. The ratio, expressed as a percentage, is calculated based on man-hours.

RECORDABLE INJURY CASES FREQUENCY RATE (RECORDABLE INJURY RATE)

The number of injuries requiring more than normal first aid per 200,000 manhours worked.

RO HOT LICENSE EXAMS

This indicator shows the number of RO Hot License exams or quizzes taken and passed for the month they were taken.

RO LICENSE EXAMINATION PASS RATIO

The ratio of station candidates passing both the oral and written NRC Reactor Operator (RO) license examination to the total number of candidates taking examinations.

SECONDARY SYSTEM CHEMISTRY PERFORMANCE INDEX

The Chemistry Performance Index (CPI) is a calculation based on the concentration of key impurities in the secondary side of the plant. These key impurities are the most likely cause of deterioration of the steam generators. The chemistry parameters are reported only for the period of time greater than 30 percent power.

The following equation is how the CPI is calculated:

$$CPI = ((Ka/1.2) + (Na/20) + (Cl/20) + (SO_4/20) + (O_2/10)) / 5$$

Where the following parameters are monthly averages of;

- Ka = Steam Generator Blowdown Cation Conductivity
- Na = Steam Generator Blowdown Sodium Concentration
- Cl = Steam Generator Blowdown Chloride Concentration
- SO_4 = Steam Generator Blowdown Sulfate Concentration
- O_2 = Condensate Pump Discharge Dissolved Oxygen Concentration

SPARE PARTS INVENTORY VALUE

The dollar value of the spare parts inventory at the end of the reporting period.

SPARE PARTS ISSUED

The dollar value of the spare parts issued for the Fort Calhoun Station during the reporting period.

SRO OPERATOR LICENSE EXAMINATION PASS RATIO

The ratio of station candidates passing both the oral and written NRC Senior Reactor Operator (SRO) license examination to the total number of candidates taking examinations.

TEMPORARY MODIFICATIONS

The number of temporary mechanical and electrical configurations to the plant's systems.

Temporary configurations are defined as electrical jumpers, electrical blocks, mechanical jumpers, or mechanical blocks which are installed in the plant operating systems and are not shown on the latest revision of the P&ID, schematic, connection, wiring, or flow diagrams.

TEMPORARY MODIFICATIONS (CONTINUED)

Jumpers and blocks which are installed for Surveillance Tests, Maintenance Procedures, Calibration Procedures, Special Procedures, or Operating Procedures are not considered as temporary modifications unless the jumper or block remains in place after the test or procedure is complete. Jumpers and blocks installed in test or lab instruments are not considered as temporary modifications. Scaffolding is not considered a temporary modification. Jumpers and blocks which are installed and for which EEAR's have been submitted, will be considered as a temporary modifications until final resolution of the EEAR and the jumper or block is removed or is permanently recorded on the drawings.

TOTAL HOURS OF STUDENT TRAINING

The total number of student hours of training for Operations, Maintenance, Chemistry and Radiation Protection, Technical Support, General Employee Training, and Other training conducted for the Fort Calhoun Station.

TOTAL SKIN AND CLOTHING CONTAMINATIONS

Reportable skin and clothing contaminations above background levels greater than 5000 dpm/100 cm squared.

UNPLANNED AUTOMATIC REACTOR SCRAMS WHILE CRITICAL

This indicator is defined as the number of unplanned automatic scrams (reactor protection system logic actuations) that occur while the reactor is critical. The indicator is further defined as follows:

- Unplanned means that the scram was not part of a planned test or evolution.

UNPLANNED REACTOR SCRAMS WHILE CRITICAL (CONTINUED)

- Scram means the automatic shutdown of the reactor by a rapid insertion of all control rods that is caused by actuation of the reactor protection system. The scram signal may have resulted from exceeding a setpoint or may have been spurious.

- Automatic means that the initial signal that caused actuation of the reactor protection system logic was provided from one of the sensors monitoring plant parameters and conditions, rather than the manual scram switches (or pushbuttons) in the main control room.

- Critical means that during the steady-state condition of the reactor prior to the scram, the effective multiplication factor (k_{eff}) was equal to one.

UNPLANNED SAFETY SYSTEM ACTUATIONS

This indicator is defined as the sum of the following safety system actuations:

- the number of unplanned Emergency Core Cooling System (ECCS) actuations that result from reaching an ECCS actuation setpoint or from a spurious/inadvertent ECCS signal

- the number of unplanned emergency AC power system actuations that result from a loss of power to a safeguards bus

An unplanned safety system actuation occurs when an actuation setpoint for a safety system is reached or when a spurious or inadvertent signal is generated (ECCS only), and major equipment in the system is actuated. Unplanned means that the system actuation was not part of a planned test or evolution.

The ECCS actuations to be counted are actuations of the high pressure injection system, the low pressure injection system, or the safety injection tanks.

VOLUME OF LOW-LEVEL SOLID RADIOACTIVE WASTE

This indicator is defined as the volume of low-level solid radioactive waste produced, in final form ready for burial, during a given period. It is calculated using the amount of waste actually shipped for disposal, plus the change in inventory of waste in on-site storage in final form ready for burial. The volume of radioactive waste that is not yet in final form ready for shipment is not included. Low-level solid radioactive waste consists of dry active waste, sludges, resins, and evaporator bottoms generated as a result of nuclear power plant operation and maintenance. Dry active waste includes contaminated rags, cleaning materials, disposable protective clothing, plastic containers, and any other material to be disposed of at a low-level radioactive waste disposal site, except resin, sludge, or evaporator bottoms. Low-level refers to all radioactive waste that is not spent fuel or a by-product of spent fuel processing.

BASIS FOR ESTABLISHING 1989 PERFORMANCE INDICATOR GOALS

This section will explain the basis used in establishing the 1989 performance goals.

FORCED OUTAGE RATE AND EQUIVALENT AVAILABILITY FACTOR

The Forced Outage Rate (FOR) and Equivalent Availability Factor (EAF) goals have been established from 1989 to 1992. The following table is a breakdown of the hours allotted for each category over the next five years.

YEAR	GENERATOR ON LINE (HOURS)	FORCED OUTAGE (HOURS)	STARTUP OUTAGE TIME (HOURS)	PLANNED OUTAGE (HOURS)	PERIOD (HOURS)	EAF (%)	FOR (%)
1989(**)	7783	168	172	737	8760	84.4	2.1
1990(*)	7036	168	172	1464	8760	75.9	2.3
1991(*)	7036	168	172	1464	8760	75.9	2.3
1992	8520	240	0	0	8760	92.9	2.7

(**) The 1988 Refueling Outage continued into January, 1989
(*) Refueling Outage Years

UNPLANNED AUTOMATIC REACTOR SCRAMS WHILE CRITICAL

The 1989 goal for Unplanned Automatic Reactor Scrams While Critical has been set at one. The Fort Calhoun Station has had one unplanned automatic reactor scram in the past three years of operation.

UNPLANNED SAFETY SYSTEM ACTUATIONS

The Unplanned Safety System Actuations goal for 1989 has been established at zero. The Fort Calhoun Station has not had an unplanned safety system actuation in the last five years.

GROSS HEAT RATE

The 1989 Gross Heat Rate goal for the Fort Calhoun Station has been set at 10,500 BTU/KWH. This heat rate goal is based on the 1988 goal of 10,075 BTU/KWH less 20.6 MW(e) stated in memo TS-FC-83-233H, written on July 17, 1983. This states that operation without the governing stage of the turbine results in a gross electrical output loss of 20.6 MW(e).

BASIS FOR ESTABLISHING 1989 PERFORMANCE INDICATOR GOALS

(CONTINUED)

FUEL RELIABILITY INDICATOR

The 1989 Fuel Reliability Indicator (FRI) goal has been set at 1.0 nanocuries/gram. This level allows for approximately one to two fuel pin failures. Although Cycle 11 was completed without any apparent fuel pin failures, there are a number of ANF assemblies entering into a third or fourth cycle of operation. When a fuel pin has been used for three or four fuel cycles there is an increased probability of fuel failure. The Failed Fuel Action Plan, Standing Order O-43, allows for approximately four fuel pin failures prior to implementing any increased action levels.

PERSONNEL RADIATION EXPOSURE (CUMULATIVE)

The 1989 Personnel Radiation Exposure (Cumulative) goal is 130 man-rem. This goal was based on 50 man-rem of cumulative exposure for the month of January, 1989, and approximately 7.5 man-rem of cumulative exposure for the months of February, 1989, through December, 1989.

VOLUME OF LOW-LEVEL SOLID RADIOACTIVE WASTE

The 1989 Volume of Low-Level Solid Radioactive Waste goal is 6,000 cubic feet. This goal was based on a recommendation made by the Fort Calhoun ALARA Committee and approved by the Division Manager of the Nuclear Production Division.

DISABLING INJURY FREQUENCY RATE

The Disabling Injury Frequency Rate 1989 goal has been set at 0.31. This goal allows for one lost time accident in the Nuclear Production Division during 1989.

FORT CALHOUN STATION
OPERATING CYCLES AND REFUELING OUTAGE DATES

EVENT	FROM - TO	PRODUCTION (MWH)	CUMULATIVE (MWH)
Cycle 1	09/26/73 - 02/01/75	3,299,639	3,299,639
First Refueling	02/01/75 - 05/09/75		
Cycle 2	05/09/75 - 10/01/76	3,853,322	7,152,961
Second Refueling	10/01/76 - 12/13/76		
Cycle 3	12/13/76 - 09/30/77	2,805,927	9,958,888
Third Refueling	09/30/77 - 12/09/77		
Cycle 4	12/09/77 - 10/14/78	3,026,832	12,985,720
Fourth Refueling	10/14/78 - 12/24/78		
Cycle 5	12/24/78 - 01/18/80	3,882,734	16,868,454
Fifth Refueling	01/18/80 - 06/11/80		
Cycle 6	06/11/80 - 09/18/81	3,899,714	20,768,168
Sixth Refueling	09/18/81 - 12/21/81		
Cycle 7	12/21/81 - 12/06/82	3,561,866	24,330,034
Seventh Refueling	12/06/82 - 04/07/83		
Cycle 8	04/07/83 - 03/03/84	3,406,371	27,736,405
Eighth Refueling	03/03/84 - 07/12/84		
Cycle 9	07/12/84 - 09/28/85	4,741,488	32,477,893
Ninth Refueling	09/28/85 - 01/16/86		
Cycle 10	01/16/86 - 03/07/87	4,356,753	36,834,646
Tenth Refueling	03/07/87 - 06/08/87		
Cycle 11	06/08/87 - 09/27/88	4,936,859	41,771,505
Eleventh Refueling	09/27/88 - 01/31/89		
Cycle 12	01/31/89 - 02/15/90*		
Twelfth Refueling	02/15/90*- 05/11/90*		
Cycle 13	05/11/90*- 09/01/91*		

* - Planned Dates

FORT CALHOUN STATION
PRODUCTION AND OPERATION RECORDS

The following seven items are the current production and operation "records" for the Fort Calhoun Station.

1. First Sustained Reaction . . . . . .August 5, 1973 (5:47 p.m.)
2. First Electricity Supplied to the System . . . . .August 25, 1973
3. Commercial Operation (180,000 KWH) . . . . . .September 26, 1973
4. Achieved Full Power (100%) . . . . . .May 4, 1974
5. Longest Run (477 days) . . . . . .June 8, 1987 - Sept. 27,1988
6. Highest Monthly Net Generation (364,468,800 KWH) .October 1987
7. Most Productive Fuel Cycle (4,936,859 MWH) . . . .June 8, 1987 - Sept. 27, 1988 (Cycle 11)

PERFORMANCE INDICATOR DATA SOURCES

PERFORMANCE INDICATOR	MANAGER/INDIVIDUAL
Age of Outstanding Maintenance Work Orders	CHAMPS
Amount of Work On Hold Awaiting Parts	CHAMPS
Auxiliary Systems Chemistry Hours Outside Station Limits	Jaworski/Stultz
Classroom (Instructor) Hours	Gasper/Kobunski
Corrective Maintenance Backlog > 3 Months Old	CHAMPS
Craft Work Activity	Peterson/Shrum
Daily Thermal Output	Holthaus/Gray
Decontaminated Auxiliary Building	Peterson/Christensen
Diesel Generator Reliability	DG Log
Disabling Injury Frequency Rate	Sorenson/Skaggs
Document Review	Peterson/McKay
DR/QRs Issued Versus NRC Violations Issued	Orr/Krieser
Equipment Forced Outages per 1000 Critical Hours	Holthaus/Gray
Equivalent Availability Factor	Dietz/Kulisek
Forced Outage Rate	Holthaus/Gray
Fuel Reliability Indicator	Holthaus/Lofshult
Gaseous Radioactive Waste Discharged to the Environment	Jaworski/Stultz
Gross Heat Rate	Holthaus/Gray
Hazardous Waste Produced	Schmidt/Sayre
Hotlines	Gasper/Kobunski
In-Line Chemistry Instruments Out-of-Service	Schmidt/Renaud
Liquid Radioactive Waste Discharged to the Environment	Jaworski/Stultz
Maintenance Work Order Backlog (Corrective Non-Outage	CHAMPS
Maintenance Work Order Breakdown	CHAMPS
Maintenance Overtime	Peterson/Shrum

PERFORMANCE INDICATOR DATA SOURCE
(CONTINUED)

Maximum Individual Radiation Exposure	Peterson/Mattice
Minor Injury Cases per Month	Peterson/McFadden
Number of NPRDS Reportable Failures	Fisicaro/Riva
Number of Out-of-Service Control Room Instruments	CHAMPS
Number of Personnel Errors Reported in LERs	LER File
Number of Violations per 1000 Inspection Hours	Orr/Krieser
Operations and Maintenance Budget	Gleason/Parent
Outstanding Modifications	Jaworski/Turner
Percent of DR/QR's Greater Than Six Months Old	Orr/Krieser
Personnel Radiation Exposure (Cumulative)	Peterson/Mattice
Personnel Turnover Rate	Jaworski/Yager
Preventive Maintenance Items Overdue	Peterson/Cagle
Primary System Chemistry - Percent Hours Out of Limits	Jaworski/Stultz
Procedural Noncompliance Incidents (Maintenance)	CHAMPS
Ratio of Highest Priority MWOs to Total MWOs Completed	CHAMPS
Ratio of Preventive to Total Maintenance	Peterson/Shrum
Recordable Injury Cases Frequency Rate	Sorenson/Skaggs
RO Hot License Exams	Gasper/Kobunski
RO License Examination Pass Ratio	Gasper/Fleuhr
Secondary System Chemistry	Jaworski/Stultz
Spare Parts Inventory Turnover Ratio	Steele/Miser
Spare Parts Inventory Value	Steele/Huliska
SRO License Examination Pass Ratio	Gasper/Fleuhr
Staffing Level	Jaworski/Yager

PERFORMANCE INDICATOR DATA SOURCE
(CONTINUED)

Temporary Modifications	Jumper Log
Total Hours of Student Training	Gasper/Newhouse
Total Skin and Clothing Contaminations	Peterson/Christensen
Unplanned Automatic Reactor Scrams While Critical	Holthaus/Gray
Unplanned Safety System Actuations	Holthaus/Gray
Volume of Low-level Solid Radioactive Waste	Peterson/Bilau

REFERENCES

INPO Good Practices OA-102, "Performance Monitoring - Management Information"

IEEE Standard 762, "IEEE Trial Use Standard Definitions for Use in Reporting Generating Unit Reliability, Availability and Productivity"

INPO Report Dated November 1984, "Nuclear Power Plant Operational Data"

U.S. Nuclear Regulatory Commission "Regulatory Guide 1.108