

JUL 14 1988

Docket Nos. 50-269, 50-270, 50-287
License Nos. DPR-38, DPR-47, DPR-55

Duke Power Company
ATTN: Mr. H. B. Tucker, Vice President
Nuclear Production Department
422 South Church Street
Charlotte, NC 28242

MA-4

Gentlemen:

SUBJECT: NRC PERFORMANCE INDICATORS

As you are aware the NRC Performance Indicators (PIs) Program is fully implemented under the direction of our Office of Analysis and Evaluation of Operational Data (AEOD). Currently, there are seven approved PIs for monitoring in the program: automatic scrams while critical, safety system actuations, significant events, safety system failures, forced outage rate, equipment forced outages and collective radiation exposure.

An interoffice task group is currently developing PIs for maintenance. The following candidate maintenance PIs were recommended for further evaluation and validation in the next few months (not listed in any priority order) and are defined in the Enclosure:

- Ratio of Preventive to Total Maintenance
- Corrective Maintenance Backlog Greater than Three Months Old
- Preventive Maintenance Items Overdue
- Maintenance Staff Turnover Rate
- Maintenance Rework
- Ratio of Deficiencies Discovered During Surveillance to those Discovered During any Demand (i.e., Demand During Surveillance or Event)
- Number and Duration of BOP Equipment Out of Service
- Safety System Performance Indicator
- Mean Time to Return to Service
- Backlog of Engineering Change Notices (ECNs) Related to Equipment Performance
- Safety System Function Trend
- Unplanned Automatic Scrams while Critical Due to Maintenance
- Post-Maintenance Tests

Your Oconee site is one of thirteen sites to be visited for data collection. As this effort should be long term to our mutual benefit, I would like to solicit your assistance in this effort. The expected impact upon your staff will vary between one and three members during the one-week data collection period. The NRC data collection team will consist of three to five members made up of NRC Headquarters, Regional, Resident and Contractor personnel. Our visit to your site is scheduled for the week of July 18-22, 1988.

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I would like to stress that this is not an inspection but an effort to collect raw data, which will be analyzed to evaluate the capability to predict safety performance from a maintenance perspective. Our effort will include discussions with your plant maintenance staff. Any insight you may provide in this area would be very helpful.

If you have any questions concerning this effort, please do not hesitate to contact T. A. Peebles, extension 4197, of my staff.

Sincerely,

(Original signed by J.N. Grace)

J. Nelson Grace
Regional Administrator

Enclosure
Candidate Maintenance Performance
Indicators

cc w/encl:
M. S. Tuckman, Station Manager

bcc w/encl:
NRC Resident Inspector
DRS Technical Assistant
H. Pastis, NRR
Document Control Desk
State of South Carolina

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KLandis:vyg
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ENCLOSURE

CANDIDATE MAINTENANCE PERFORMANCE INDICATORS

DEFINITIONS:

1. Ratio of Preventive to Total Maintenance. The definition of this indicator is identical to the one used by INPO. It is the ratio of non-outage preventive and surveillance testing man-hours to total non-outage maintenance (corrective and preventive maintenance, and surveillance testing) man-hours performed within a reporting period.
2. Corrective Maintenance Backlog Greater than Three Months Old. This indicator (used by INPO) is defined as the percentage of total outstanding open corrective maintenance work requests (MWRs), not requiring an outage to perform that are greater than three months old at the end of the period reported.
3. Preventive Maintenance Items Overdue. This indicator (used by INPO) is defined as the percentage of all preventive maintenance items in the period that were not completed by the schedule date plus a grace period equal to 25% of the schedule interval beginning at the last time preventive maintenance was performed.
4. Maintenance Staff Turnover Rate. It is the number of vacancies in a functional group, e.g., mechanical maintenance department, created by voluntary resignation divided by the average number of employees in that group. Retirement, death, promotion, termination for cause and part-time employment are not considered in the turnover rate.
5. Maintenance Rework. Several definitions can apply for this indicator, viz,
 - (i) the number of MWRs reopened within a reporting period,
 - (ii) the number of maintenance activities which could not be declared operable after maintenance work was completed,
 - (iii) the number of repeat corrective maintenances performed on the same component, or
 - (iv) the number of repeat corrective maintenances performed on a class of components.
6. Ratio of Deficiencies Discovered During Surveillance to those Discovered During any Demand (i.e., Demand During Surveillance or Event).
(self-explanatory)
7. Number and Duration of BOP Equipment Out of Service. It is the total number of BOP equipment that are out of service in a period. The out of service duration of each BOP equipment in a period is added to obtain the duration of BOP equipment out service. (see data needs sheets for additional details)
8. Safety System Performance Indicator. This performance indicator (used by INPO) is calculated separately for three systems. The systems for PWRs are: high pressure safety injection; auxiliary feedwater; and emergency AC power.

The systems for BWRs, are: high pressure coolant injection or high pressure core spray; reactor core isolation cooling or isolation condenser; residual heat removal; and emergency AC power. For each system, this indicator is defined as the sum of the unavailabilities of the components in the system during a time period, divided by the number of trains in the system.

9. Mean Time to Return to Service. It is defined as the sum of the out of service durations of equipment in a period divided by the number of equipment. Only major equipment (e.g., those in the NPRDS) that are out of service due to failures are considered.
10. Backlog of Engineering Change Notices (ECNs) Related to Equipment Performance. It is defined as the percentage of ECNs generated by plant staff to correct equipment performance problems that were not completed within the schedule plus a grace period equal to 25% of the scheduled completion time.
11. Safety Systems Function Trends. This indicator estimates of the unavailability and mean time between failures of seven selected safety systems, based on train-level data. The train data are: (1) The number of hours each of these trains is taken out of service while the reactor is critical; and (2) the number of train failures (ie loss of train function). The selected systems for PWRs are: KFW, HPI, SWS, Emergency Power/AC, Emergency Power PC, RPS trip breakers and logic, and containment spray (or containment cooling). For BWRs, the selected systems are: RCIC, HPCI (or HPCS) SSWS, Emergency Power/AC, Emergency Power/DC, RPS trip breaker and logic, and containment spray (or containment cooling).
12. Unplanned Automatic Scrams while Critical Due to Maintenance. The definition of this indicator is identical to the one used by INPO. It is the number of unit unplanned automatic reactor scrams that occurred while the reactor was critical and that were caused by maintenance activities.
13. Post-Maintenance Tests. The number of post-maintenance performed and the number of post-maintenance tests reported as failed within a reporting period.

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CANDIDATE PI: Safety System Function Trend.

ATTRIBUTE: Impact on Safety System/Train Availability. This indicator monitors the effectiveness of plant programs aimed at maintaining the availability and reliability of selected safety systems/trains.

DATA NEEDS:

- (1) One time data (See Table 1)
- (2) Quarterly data (See Table 2).

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TABLE 1

ONE TIME DATA: SAFETY SYSTEM FUNCTION TRENDS

System	Surveillance Test Interval	Number of Trains in System	Success Criteria: i.e., Number of Trains needed to perform system function
AFW (RCIC)			
HPI (HPCI/HPSI)			
SWS (SSWS)			
EPS/AC			
EPS/DC			
RPS			
Trip Breakers			
Logic			
Containment Spray (Containment Cooling)			

Table 2: SAFETY SYSTEM FUNCTION TRENDS

Plant/Unit: _____; Type of Record: _____; Name: _____; Date: _____

System*/Train*/Component	Tech Spec Paragraph Number	Train Failure* (i.e., loss of Train Function Yes or No	Draft/Time* Removed from Service	Date/Time* Restored to Service	For Train or System Failures. Summarize Trouble, method of discovery (i.e., surveillance test? real demand? EQ?) Causes, and work done
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Means Mandating Data; Collect the other data it convenient.

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CANDIDATE PI: Safety System Performance Indicator (INPO)

ATTRIBUTE: Impact on Safety System/Train Availability. This indicator monitors the effectiveness of plant programs aimed at maintaining the availability of selected safety systems/trains.

DATA NEEDS: PWRs - For HPSI, AFW and Emergency AC Power Systems
BWRs - For HPCI/HPCS, RCIC/Iso Condenser, Emergency AC Power Systems

- (1) Component Unavailable Hours in a quarter - known and estimated.
- (2) Hours Systems required.
- (3) Number of trains.

CANDIDATE PI: (1) Number and duration of BOP Equipment out of service (e.g., IA Compressor CCW Pump etc.)
(2) Amount of maintenance done on BOP equipment vs. safety-related equipment.

ATTRIBUTE: Impact on BOP Systems/Transients

DATA NEEDS: (1) Equipment Name/ID, Date and Time taken out of service, Date and Time placed in service.
(2) No. of BOP (non-safety) MWRs, No. of safety-related MWRs.
(3) See Table 3 for list of BOP components

- Condensate and Makeup System
 - Condensate and booster pumps (includes driver)
 - Low press heaters
 - Condenser
 - Condensate storage tanks
 - Condensate demineralizers
 - Valves in main flow path
- Feedwater System
 - Pumps and driver
 - FW heaters
 - Control system
 - Valves in main flow path
- Heater Drain System
 - Pumps
 - Valves in main flow path
- Circulating Water System
 - Pumps
 - Traveling Screens
 - Valves in main flowpath
- Non Nuclear Service Water System
 - Pumps
 - Traveling screen (Heat exchanger in CCW)
 - Valves in main flow path
- Closed Cooling Water System (Non-Nuclear)
 - Pumps
 - Heat exchanger
 - Valves in main flow path
- Instrument/Service Air System
 - Compressor
 - Dryers
 - Accumulators
 - Regulators (reducing stations)
 - Valves in main flow path

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• AC Power

- Station, aux, main transformers
- Busses
- X-ties
- Main power breakers and associated relays
- Control power

• Turbine Generator and Support

- Turbine Generator
- MSR (Main Steam Reheat)
- Turbine control and bypass valves
- Turbine lube oil
- Voltage/frequency regulation (includes overspeed protection)
- Stator cooling
- EHC

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CANDIDATE PI: Repeat Equipment Failures in Individual Systems

ATTRIBUTE:

- (1) Repeat corrective maintenance on the same component. Maintenance repeated on the same component for the same anomaly exhibited in a follow-up test or demand.
- (2) Repeat corrective maintenance on identical components. Maintenance performed on identical components exhibiting the same failure cause.

DATA NEEDS:

- (1) Utilize NPRDS to count, sort, and evaluate for repeat corrective maintenance

- (2) Plants work order tracking system

System Cause, Equipment ID, date of failure, component type, cause of failure, selected NPRDS engineering and failure fields.

- (3) No. of corrective MWRs on the same equipment in a quarter (only major equipment considered).

- (4)- Alternately, No. of corrective MWRs re-opened in a period.

CANDIDATE PI: Maintenance Staff Turnover Rate

ATTRIBUTE: Maintenance Department Staffing/Turnover. Organizational factor indicating work force stability and accumulated experience

DATA NEEDS:

- (1) Number of vacancies, by type (e.g., I&C group), created by voluntary resignation from the maintenance department in a quarter. Retirement, death, promotion, termination for cause and part-time employed are not considered as part of the vacancies.

- (2) Average number of employees by type in the quarter

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- CANDIDATE PIs:
- (1) Corrective Maintenance Backlog Greater Than Three Months Old (INPO).
 - (1a) Corrective Maintenance Backlog due to Spare Parts
 - (2) Preventive Maintenance Items Overdue (INPO).
 - (3) Normalized Corrective Maintenance Backlog.

ATTRIBUTE: Maintenance Backlog. Effectiveness of work prioritization and backlog controls.

- DATA NEEDS
- (1) Same as for INPO
 - (1a) Those in Item 1 due to Spare Parts.
 - (2) Same as for INPO.
 - (3) Same as in Item 1 and the estimated man-hours to close those MWRs.

CANDIDATE PI: Ratio of Preventive to Total Maintenance Manhours (INPO).

ATTRIBUTES: Resources/Preventive Maintenance. Effectiveness in avoiding equipment failures and a measure of maintenance effort on preventive measures.

DATA NEEDS: Same as for INPO.

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CANDIDATE PI: Automatic Scrams While Critical due to Maintenance (INPO).
ATTRIBUTES: Scram/Cause Codes
DATA NEEDS: Same as for INPO.

CANDIDATE, PI: Backlog of Engineering Change Notices (ECNs) related to Equipment Performance.

ATTRIBUTE: The percentage of ECNs generated by the plant staff to correct equipment performance problems that were not completed within the schedule plus a grace period equal to 25% of the scheduled completion time.

DATA NEEDS:
(1) Total of ECNs
(2) Number of ECNs which exceeded 25% of scheduled time.

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CANDIDATE PI: Ratio of Deficiencies discovered during an actual demand (event) to deficiencies discovered by all measures (e.g., surveillance, events, and other means) for systems/ components under surveillance.

ATTRIBUTES: Effectiveness of Surveillance Programs

DATA NEEDS:

- (1) No. of surveillance tests that discovered deficiencies in a quarter.
- (2) No. of deficiencies discovered during any demand in a quarter

CANDIDATE PI: Post-maintenance tests

ATTRIBUTE: Quality and Effectiveness of Post-Maintenance Testing.

DATA NEEDS:

- (1) Number of Post-maintenance tests in a quarter.
- (2) No. of failed post-maintenance tests in a quarter.

CANDIDATE PI: Mean Time to Return to Service.

The sum of the out of service durations of failed equipment in a period divided by the number of equipment. Only major equipment (e.g., those in NPRDS) that are out of service due to failures are considered.

ATTRIBUTES: Effectiveness of maintenance implementation and work control.

DATA NEEDS: For selected major equipment.

- (i) Date and time failure discovered,
- (ii) Date and time equipment declared operable.

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Maintenance Staffing Indicator Sheet

During Previsit, request that licensee provide the following:

1. Total number of positions approved in maintenance department.
2. Total number of positions filled in the maintenance department.
3. Average years of service in maintenance department position.
4. Average years of maintenance department personnel with the company.
5. Number of vacancies by department/group in maintenance. Do not include vacancies due to retirement, death, promotion, termination for cause and part-time employees.

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List of Potential Data Sources

LCO

LER - further support of MWO & LCO

MWO/MWR

Operations logs - Support MWO & LCO may include others

NPRDS - Support MWO

Clearance Logs - Support MWO

Maintenance history - Support MWO

Spare Parts inventory -

P.M. Program/Schedule

NRC Monthly Operating Report -

Engineering change notices

Surveillance test records

Post maintenance records

*Technical Specification

*Equipment lists

*P&IDs and Electrical one line diagrams

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Totals and Other Items not Applicable on a Form

Total number of BOP Equipment out of service (for selected equipment see table 3)

Total number of all safety related MWO/MWR

Total number of all BOP related MWO/MWR

Number of corrective MWRs on the same component.

Number of corrective MWRs re-opened (re-issued)

Number of maintenance work orders backlogged due to spare parts unavailability

Number of PM items completed during quarter

Number of PM not completed within allowable interval

Estimated man-hours required to complete backlog of MWO/MWRs

Man-hours expended on PMT

Man-hours expended on technical specification surveillance

Man-hours expended on CM's

Total Number of ECNs

Number of ECNs exceeding 25% of schedule implementation time

Number of deficiencies discovered during any demand

Number of deficiencies discovered during surveillance testing

Number of PMT

Number of failed PMT

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Data Elements Found on Typical LCO

Plant/Unit: _____
 System/Train/Component: _____ / _____ / _____
 Tech. Spec. Paragraph Number: _____
 Train Failure Yes or No: _____
 Date equipment taken or declared out of service: _____
 Time equipment taken or declared out of service: _____
 Date equipment returned to service (declared functional): _____
 Time equipment returned to service (declared functional): _____

*Summary of event

include: methods of discovery, cause, corrective action etc.:

Notes:

1. Number of Trains - use Table 1.
2. Hours systems required - can be calculated from Tech. Spec. requirements at NRC monthly operating report.
3. Component unavailable hours in a quarter.
 Known - difference in dates and time above.
 Estimated - ? (half the time below tests....)

*This data element will most likely have to be taken from either operators log (use dates and time to find) or a MWO/MWR (see, if the associated MWO/MWR is identified on LCO)

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Data Elements found on Typical MWO/MWR

System¹: _____
Component: _____
Component type: _____
Date failure discovered: _____
Time failure discovered: _____
Date returned to service: _____
Time returned to service: _____
Method of discovery²: _____
Cause/failure mode: _____
Corrective action: _____
Man-hours expended: _____
Corrective or preventive maintenance: _____
Post maintenance test performed: _____

1. System determine whether BOP or safety.
2. Was deficiency discovered during surveillance or other demand.
3. Component unavailable hours can be calculated by taking the difference in the dates and times above.

Summary of Maintenance Action include: method of Discovery,
cause/failure mode, corrective action

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Data Source Feedback Sheet
(shall be prepared right after the first visit)

1. Plant/Unit:
2. For each data element (see attachment 1) respond to the following questions:
 - a. Can the information on the data element be extracted from plant records?
 - b. If yes to a); Identify the specific plant record/records that can provide the needed information. For each record specify the time span of existence (e.g., 5 yrs, etc.), and the record format (computerized, internally generated document, eligible hard copy, etc.)
 - c. Review at least 10 sample sheets from the record and determine what portion of the sample sheets contained the needed information (e.g., if the needed information for the data element was missing in 2 of the 10 sample sheet you may report 80% coverage).
 - d. If multiple records provide information on the same data element, make a recommendation as to what data record is more appropriate to be considered for data collection phase. The main selection criteria are:
 - i) high coverage (item c)
 - ii) data span greater than 5 yrs
 - iii) ease of data extraction
3. Group the data elements based on their common data sources. Provide separate sheets for all the data elements with a common data source which can be used for data collection phase.
4. Provide one sheet identifying those data elements that can not be collected and shall not be pursued.
5. Note any other positive or negative expects or the data sources reviewed.

A short Guide for Identifying Potential Data Problems

1. Are records computerized, hard copy copy, microfilm, microfiche, etc.
 - A. If computerized
 - is the output fixed or can it be tailored to the needs of this program
 - is it P.C. compatible
 - is it up to date
 - is it complete or do the computerized files makeup a limited subject of the actual record
 - B. If hard copy
 - is it filed in an organized method
 - is it legible
 - is it manageable
 - C. If Microfilm or microfiche
 - is it organized in any useable format
 - is it legible
 - is it manageable
2. If logs or record books
 - Do they capture the information required by the program or are they only an accounting function
3. Are individual items of the record recorded in a standardized fashion (for example; are component IP's analyzed or are they listed in several different ways)
4. Are other documents required to identify computers such as P&IDs or equipment lists. If so are they available.
5. Does the MWO address a single component, train or system, or are multiple components identified on a MWO.

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Maintenance Performance Indicators Data Elements

- Surveillance test intervals (operability trends)
- Number of trains in system
- Safety system function success criteria
- Plant/unit
- Type of record
- System/train/component
- Technical specification paragraph number
- Train failure (loss of train function yes or no)
- Date/time removed from service (taken out of service) (failure)
- Date/time restored to service
- Summary of event
 - method of discovery
 - cause
 - corrective action
- Component unavailable hours in a quarter (known and estimated)
- Hours system required functional
- Component ID (equipment IP)

- *Total number of BOP equipment out of service (really total number of BOP MWRs for specified components)
- *Total number of BOP MWR's all BOP components
- *Total number of all safety related MWRs
- Component Type
- System
- Cause of failure or failure mode
- Number of corrective MWRs on the same component in a quarter
- Number of corrective MWRs re-opened (re-issued in a period)
- Component manufacturer
- Component manufacturer model number

- Total number of positions approved in maintenance
- Total number of positions filled in maintenance
- Average years of service in positions
- Average years with the company
- Number of vacancies (see exclusions)
- Average of employees by department/group in the quarter.
- Number of maintenance work orders backlogged due to spare parts unavailability
- Number of preventive maintenance actions completed during quarter
- Number of preventive maintenance items not completed within the allowable interval
- Estimated man-hours required to complete backlog of MWRs
- Man-hours expended on preventive maintenance completed during the quarter
- Man-hours expended on technical specifications surveillance during the quarter
- Man-hours expended on corrective maintenance work requests completed during the quarter.
- Number of unplanned automatic SCRAMS while critical caused by or occurred during maintenance related activities.
- Total number of engineering change notices

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- Number of engineering change notices which exceeded 25% of scheduled implementation time
- Date ECW scheduled
- Date ECW issued
- Date ECW implemented
- Number of deficiencies discovered during any demand in a quarter
- Number of surveillance tests that discovered deficiencies in a quarter
- Number of post maintenance tests in a quarter
- Number of failed post maintenance tests in a quarter

I. Safety System Function Trend (One time data)

- o Data elements appear in Table 1 (attached)
 - *Surveillance Test interval (Tech Spec)
 - Number of Trains in System (Actual)
 - Success Criteria (Tech Specs)

*Operability tests

- o Quarterly Data

Data elements appear in Table 2 (attached)

- Plant/Unit
- Type of record
- Data collected by
- Date data collected
- System/Train/component
- Tech spec paragraph number
- Train failure (loss of train function Yes or No)
- Date/time removed from service
- Date/time restored to service
- Summary of event.
 - o method of discovery
 - o cause
 - o corrective action

Possible Sources:

Plant Data

- o LCO's
- o LER's
- o MWO's/MWRs (1)
- o Operators Logs

Other Data

- o NPRDS

II. Safety System Performance Indicator

- Component unavailable hours in a quarter (known and estimated)
- Hours system required
- Number of trains

This is provided in the Quarterly Plant Performance Indicator Data, supplied to INPO each quarter.

III. Number and Duration of Selected BOP Equipment out of Service (see table 3, attached)

- Equipment Name/ID
- Date/Time taken out of service
- Date/Time restored to service
- Total number of above events

(1) automated (computerized) work order tracking system.

Amount of maintenance done on BOP Equipment vs. Safety related equipment.

- Total number of MWRs associated with all BOP components.
- Total number of MWRs associated with all safety system components.

Possible Sources:

<u>Plant</u>	<u>Other</u>
MWO's/MWRs (1)	NPRDS
Clearance Logs	
Operators Logs	
Maintenance history	

IV. Repeat Equipment Failures in Individual Systems

1. Repeat corrective maintenance on the same component.
 - o Equipment ID
 - o Date of failure
 - o Component type
 - o System
 - o Cause of failure/failure mode
 - o Number of corrective MWR's on the same equipment in a quarter
 - o Number of corrective MWR's re-opened (re-issued) in a period.
2. Repeat corrective maintenance on identical components.

Same as above and,

 - o Manufacturer
 - o Manufacturer model number

Possible sources:

<u>Plant</u>	<u>Other</u>
MWOs/MWRs (1)	NPRDS
Maintenance history	

V. Maintenance Staff Turnover Rate

Maintenance Department staffing/turnover

- o Total number of positions approved in maintenance
- o Total number of positions filled
- o Average years of service in position
- o Average years with company

(1) automated (computerized) work order tracking system.

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- Number of vacancies, by department/group in maintenance. Do not include vacancies due to retirement, death, promotions, termination for cause and part-time employees.
- Average numbers of employees by department/group in the quarter.

Possible sources:

Human Resources or Personnel departments.

VI. 1. Corrective Maintenance Backlog greater than three months old.

- Equipment Name/ID
- Date/time taken out of service
- Date/time restored to service

This is provided in reduced form in the Quarterly Plant Performance Indicator Data, supplied to INPO each quarter.

(1a) Corrective Maintenance Backlog due to Spare Parts.

- Of the maintenance work orders, identified in (1) above, determine which ones are backlogged due to spare parts unavailability.

2. Preventive Maintenance Items Overdue

- Number of PMs completed during the quarter.
- Number of PM's not completed within the allowable interval (125% of scheduled interval)

Also: a cursory review/evaluation of the Preventive Maintenance program should be performed. Key areas include,

- In-house project management system to track P.M. program
- Method in place for determining/evaluating P.M. program (does formal program exist?)
- P.M. Schedule (is it implemented?)

This is provided in the Quarterly Plant Performance Indicator Data, supplied to INPO each quarter.

3. Normalized Corrective Maintenance Backlog

Same as item (1) above plus the estimated man-hours required to complete those MWRs.

(No Specific plant Data)

(1) automated (computerized) work order tracking system.

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Possible Sources:

Plant

MWO/MWRs (1)
Maintenance history
Spare parts backlog inventory
P.M. program/schedule

VII. Ratio of Preventive to Total Maintenance Man-hours.

- Man-hours expended on preventive maintenance completed during the quarter.
- Man-hours expended on technical specification surveillance during the quarter.
- Man-hours expended on corrective maintenance work requests completed during the quarter.

This is provided in the quarterly Plant Performance Indicator Data, supplied to INPO each quarter.

Possible Sources:

Plant

MWOs/MWRs (1)
Maintenance history
P.M. program/schedule

VIII. Automatic Scrams While Critical due to Maintenance Man-hours.

- The number of unplanned automatic scrams while critical that were caused by or occurred during maintenance related activities.

This is provided in the Quarterly Plant Performance Indicator Data, supplied to INPO each quarter.

Possible sources:

NRC monthly operating Report. (not Greybook)
NRC Interoffice Group Report.

(1) automated (computerized) work order tracking swse

IX. Backlog of Engineering Changes Notices (ECNS) Related to Equipment Performance

- o Total # of ECN's
- o Number of ECN's which exceeded 25% of scheduled implementation time
- o Date scheduled
- o Date issued
- o Date implemented

Possible sources:

Look for a record such as a ECN logbook or computer tracking system.

X. Ratio of Deficiencies discovered during an actual demand (event) to deficiencies discovered by all measures for systems/components under surveillance.

- Number of deficiencies discovered during any demand in a quarter
- Number of surveillance tests that discovered deficiencies in a quarter.

Possible Sources:

<u>Plant</u>	<u>Other</u>
MWO/MWR (1)	NPRDS
Operator logs	
Surveillance Test Records	
LCOs	
LERs	

XI. Post-Maintenacne Tests (PMT)

Quality and effectiveness of post maintenance testing.

- number of PMTs in a quarter.
- number of failed PMTs in a quarter.

(1) automated (computerized) work order tracking system.

Possible sources:

Post Maintenance Tests
MWO's/MWRs (1)
LCO
LER
Maintenance history
Operators Logs

XII. Meantime to Return to Service

Effectiveness of maintenance implementation and work control. The sum of the out-of-service durations of failed components in a period divided by the total number of components that failed.

- Date/time failure discovered
- Date time failure corrected
- Total number of failures

Possible Sources:

<u>Plant</u>	<u>Other</u>
MWO's/MWRs (1)	NPRDS
Maintenance history	
LCO	

(1) automated (computerized) work order tracking system