



# **Facility Operations**

## **Targeted Self-Assessment**

*Quarterly Report on Trends in PNNL Occurrences  
and  
Performance Analysis of Operations Information  
(1st Qtr, FY'05)*

**January 31, 2005**

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## **Executive Summary:**

PNNL reportable occurrence activity for the first quarter of FY 2005 (14 occurrences) was well above the historical average of 8.69 occurrences per quarter. However, 5 of those were SC-4 occurrences for discovery of suspect/counterfeit (S/C) items; without which the 14 total would have been very near the historical average.

The 14 first quarter reports break down as follows (see page 4 for a listing of the reports):

- five were management concerns - at SC-3 and SC-4 levels
- two were personnel safety events (one a broken leg, the other a hazards control issue) - both SC-2 occurrences
- five were S/C bolts issues - all SC-4's, and
- two others reported noncompliance to external regulators.

The master control chart in this report (Figure 1) shows no adverse statistical trends in reportable occurrences from this quarter, even with the extra 5 S/C bolt discoveries.

An apparent cause graph is also included in this report, but it does yet not reveal any useful information, as it includes only five quarters of data; whereas 24 are needed before a statistically relevant trend can be discovered.

In addition to the above, PNNL "occurrences per 200,000 man-hours" are charted in Figure 5, showing an above average rate of 1.8 occurrences per 200,000 man-hours for the quarter - versus the average of 1.0; a rate compounded by an increase in occurrences and a decrease in manhours (from SHIMS). When comparing our average occurrence per 200,000 man-hours to the other DOE National Laboratories (Figure 6), PNNL ranks just below average (see comment on Figure 6).

Figure 8 provides a glimpse of the historical trend in PNNL occurrences since ORPS first full year of operation in FY 1991.

## **Performance Assessment:**

The DOE occurrence reporting manual M 231.1-2 requires assessment of reportable and non-reportable events for recurring trends. This assessment found no trends or issues to elevate for potential categorization as SC-R occurrences (Figure 7).

This quarter's review focused on reportable and non-reportable data from ORPS, CAIRS, QPRs, RPRs, and 2400 Reports\*.

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\* ORPS = DOE's Occurrence Reporting & Processing System  
CAIRS = DOE's Computerized Accident/Incident Reporting System  
QPR = Quality Problem Report  
RPR = Radiological Problem Report  
2400 Reports = Notifications to PNNL Single Point of Contact

## **Scope:**

The Event Reporting Program Description establishes the minimum scope for this assessment, requiring that "the data include quarterly trends relative to category, nature of occurrence, and root cause." This assessment's conclusions are substantiated through (Figure 1) a quarterly Control Chart of total reportable

occurrences tabulated by quarter, (Figure 2) Significance Category, (Figure 3) Criteria Group totals, (Figure 4) Cause Codes assigned, (Figure 5) PNNL Occurrences normalized to 200,000 man-hours, and (Figure 6) a CY comparison against seven other DOE National Laboratories.

The performance analysis portion of this report looks at a larger cross section of safety, environmental, quality and facility operations issues by combining CAIRS, RPR, QPR, ORPS and 2400 Report data for analysis. A control chart summarizing the results from this analysis is presented in Figure 7. There were no trends or "recurring" issues warranting reporting as a Significance Category R (SC-R) occurrence.

**Assessment Category:**

Event Reporting

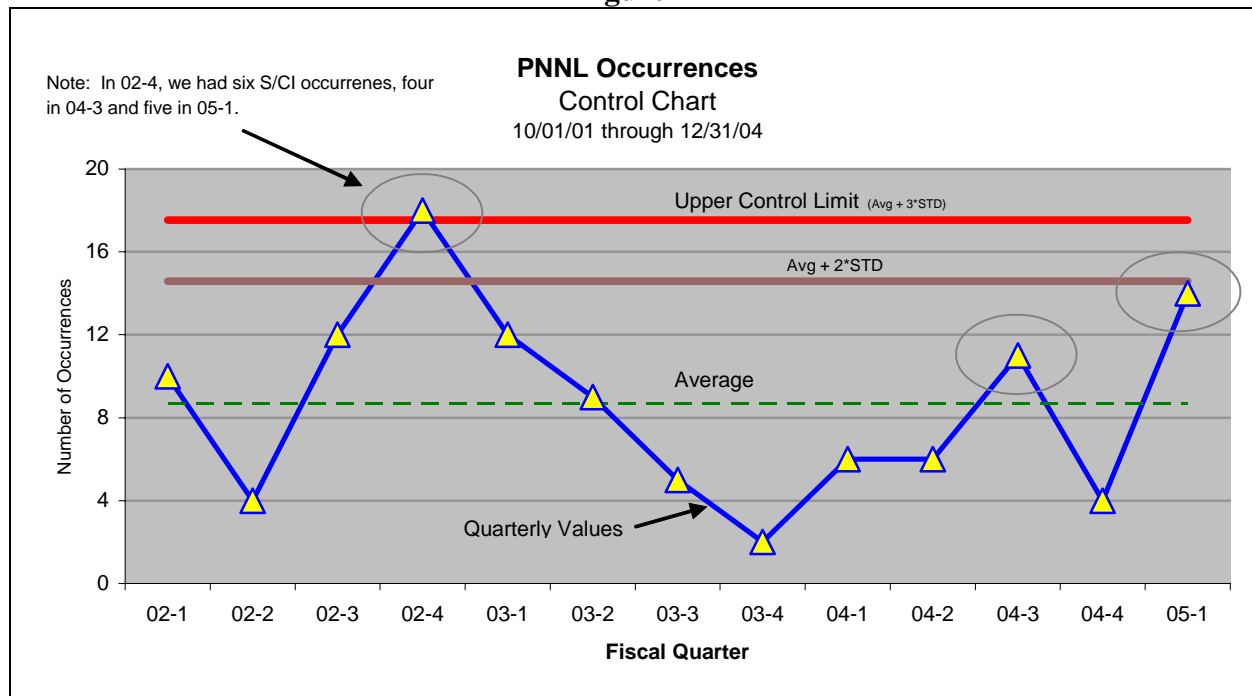
**Performance Objectives:**

Identify and analyze trends in selected occurrence data and provide results to appropriate organizations and management, including the Price-Anderson Working Group.

**Results:**

Figure 1 is a control chart of total occurrences by quarter that is used to determine if a "statistically significant" trend has developed that requires management's attention. In Figure 1, the number of occurrences in the first quarter of FY 2005 was above the average (8.69) with 14 total occurrences. The Figure 1 control chart does not identify any statistically significant trend (e.g., above the Upper Control Limit) for the quarter.

**Figure 2**



Occurrences reported during the quarter (MC = Management Concern; S/C = Suspect/Counterfeit):

- [BOPER-2004-0015](#) Staff Injured - Grounds Utility Vehicle [Type-B Investigation] (RRC)
- [BOPER-2004-0016](#) MC Regarding Rad Material Transportation and Control (Pasco Airport)
- [BOPER-2004-0017](#) Staff Member Receives Minor Burn from Heat Trace Line (323)
- [BOPER-2004-0018](#) Spill of Mixed Waste Resulting in Environmental Near Miss (RTL-520)
- [NUCL-2004-0008](#) MC Related to Strontium-90 Contaminations (RPL)
- [BOPER-2004-0019](#) S/C Fasteners Discovered in Pipe Flange to Pump Connection (APEL)
- [BOPER-2004-0020](#) MC Related to Consultant Exceeding Work Scope (LSL-II)
- [BOPER-2004-0021](#) S/C Bolts Discovered in Utility Vehicle (RTL-550)
- [BOPER-2004-0022](#) MC Management of Volumetrically Released Materials (Multiple)
- [BOPER-2004-0023](#) S/C Bolts Discovered in University Equipment in ALE Nike Site (6652-L)
- [BOPER-2004-0024](#) S/C Bolts Discovered During Self-Assessment (Multiple)
- [BOPER-2004-0025](#) City Notified Of Waste Water Permit Noncompliance (Sigma-V)
- [BOPER-2004-0026](#) S/C Bolts Discovered During Follow-Up Self-Assessment (Sigma-V)
- [BOPER-2004-0027](#) WDoE Notified of Waste Waster Permit Noncompliance (Sequim)

Figure 2, provides a representation of occurrences relative to significance categories.

**Figure 2**

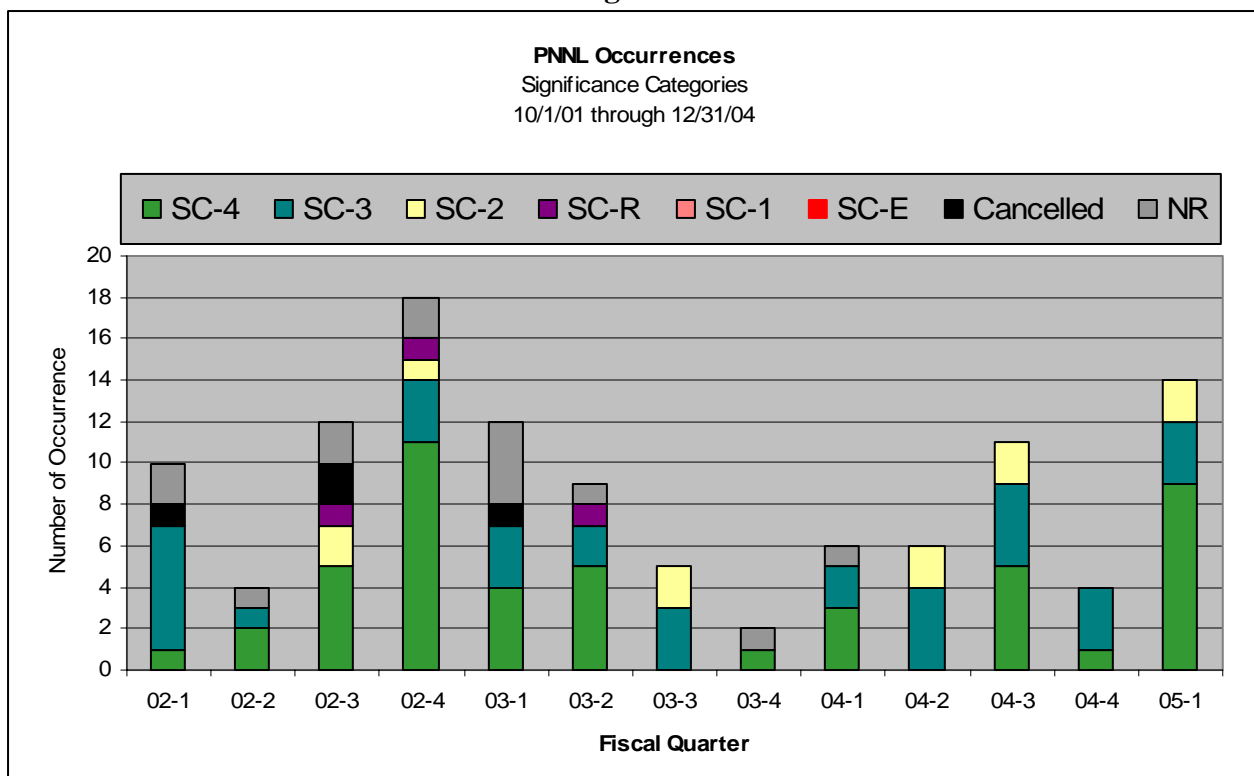


Figure 2 shows the breakdown of significance categories by quarter. The leading category for the first quarter of FY-2005 was SC-4; at 64% of the reportable occurrences. Figure 2 also includes past occurrences (before 11/3/03) which were backfit to the new criteria and significance categories. NR highlights occurrences that would have been categorized as Not

Reportable if had occurred after November 3, 2003 (date DOE M 231.1-2 criteria changes were put into effect).

In Figure 3 the occurrences are graphed according to their criteria groups. The NR's noted above are included as an element of the bar chart to show the total reporting for past quarters. The yellow background area shows the same NR values per quarter separately for effect.

**Figure 3**

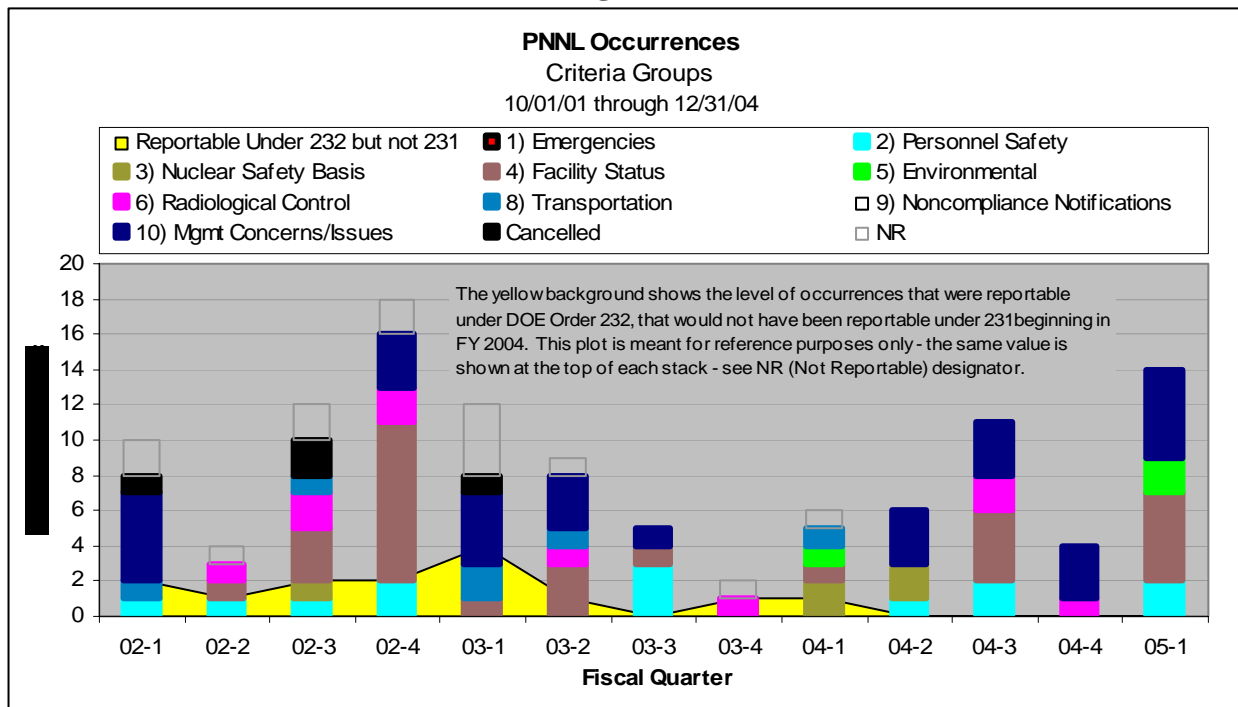


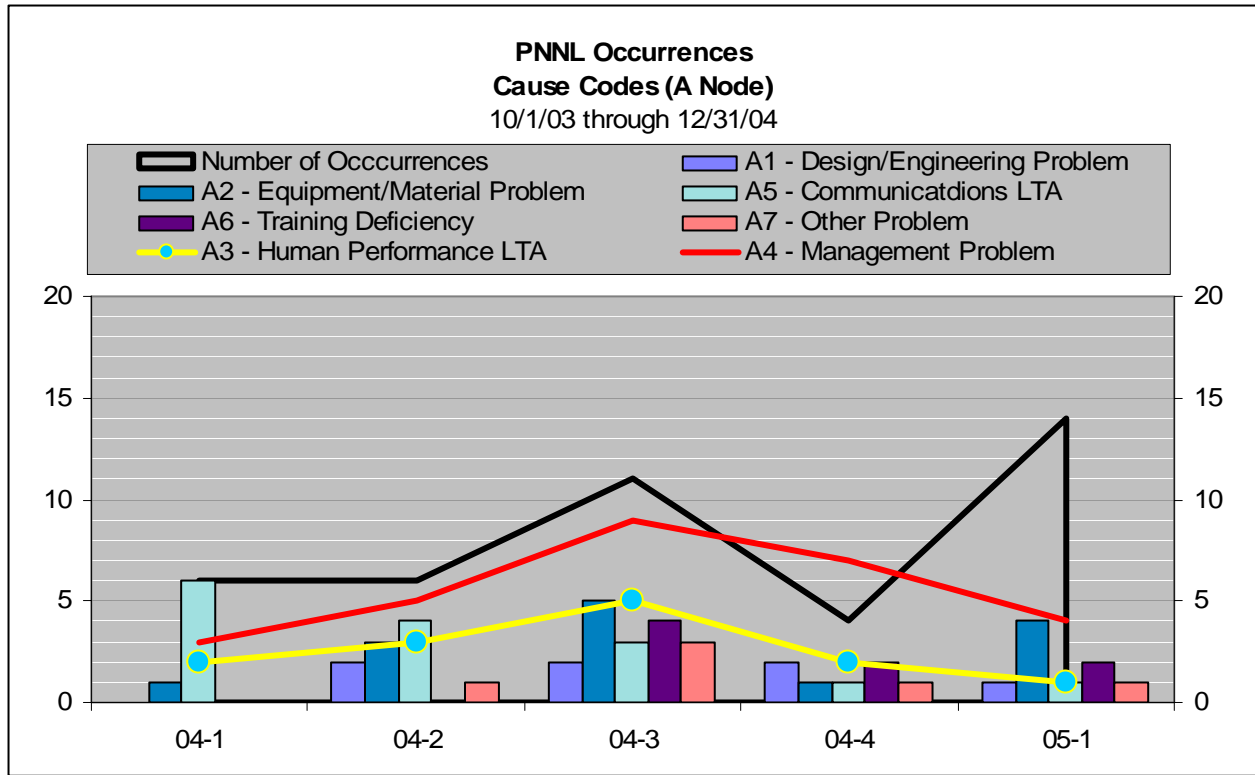
Figure 4 represents the total PNNL occurrences by apparent cause code.

As a reminder, there are 166 "apparent cause" codes in DOE G 232.1-2; as compared to just 34 in the old occurrence reporting order. Consequently, it is impractical to try and convert (i.e., back-fit) FY 2002 and 2003 data as was done with the reporting criteria; therefore, we have elected to simply start reporting the raw numbers beginning with FY 2004 and comment on any developing trends as they materialize.

Also, it appears that identifying trends by cause codes will be very difficult unless we limit the analysis to just the second tier substructure (referred to as the "B" node; of which there are 29, making them comparable to the old 34 code structure). Again, the full apparent cause code structure (with 166 "C" node codes) may be just too unwieldy to trend.

It should also be noted that the trend analysis of causes will be limited to SC-3 and higher occurrences, since SC-4 occurrences are entered into ORPS with basically just a description of the event and the immediate actions taken. A formal causal analysis is not required for SC-4's.

Figure 4



Next, in Figure 5, the number of occurrences per 200,000 man-hours worked are shown using man-hours from SHIMS. The number remains low, averaging just 1.0 occurrence per quarter.

Figure 5

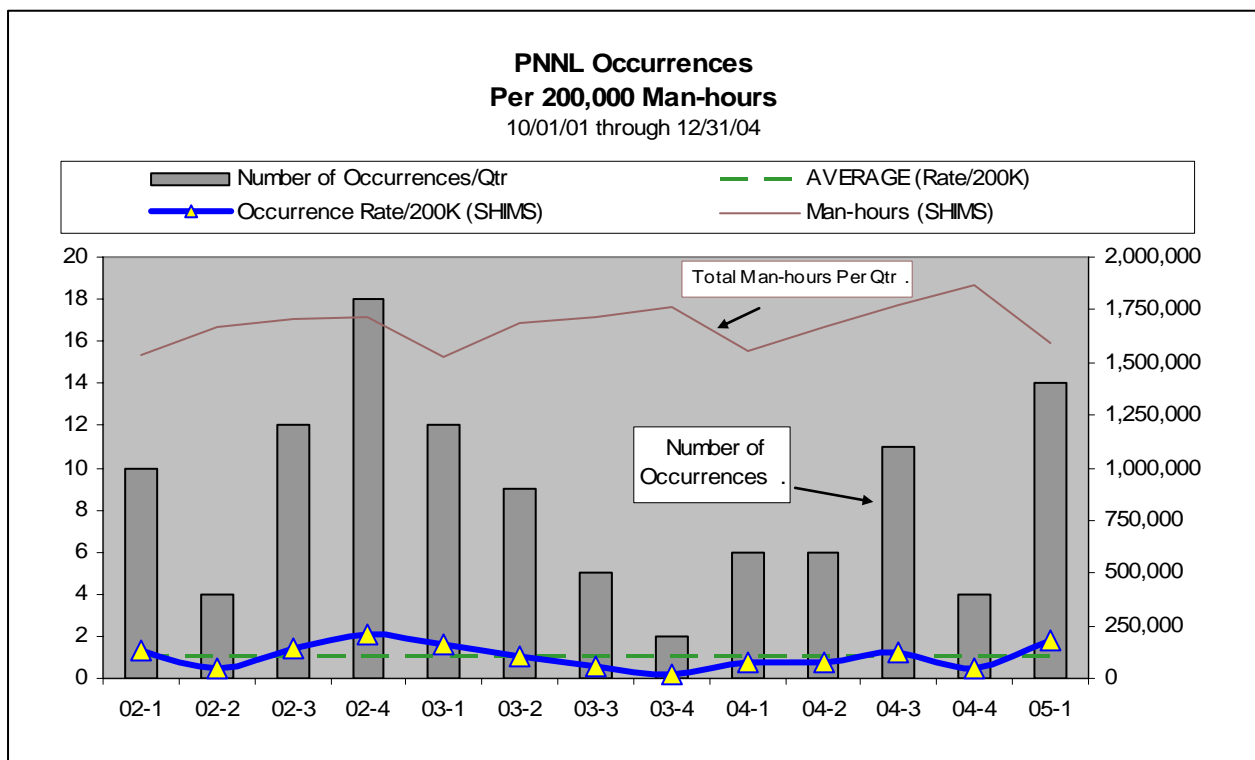
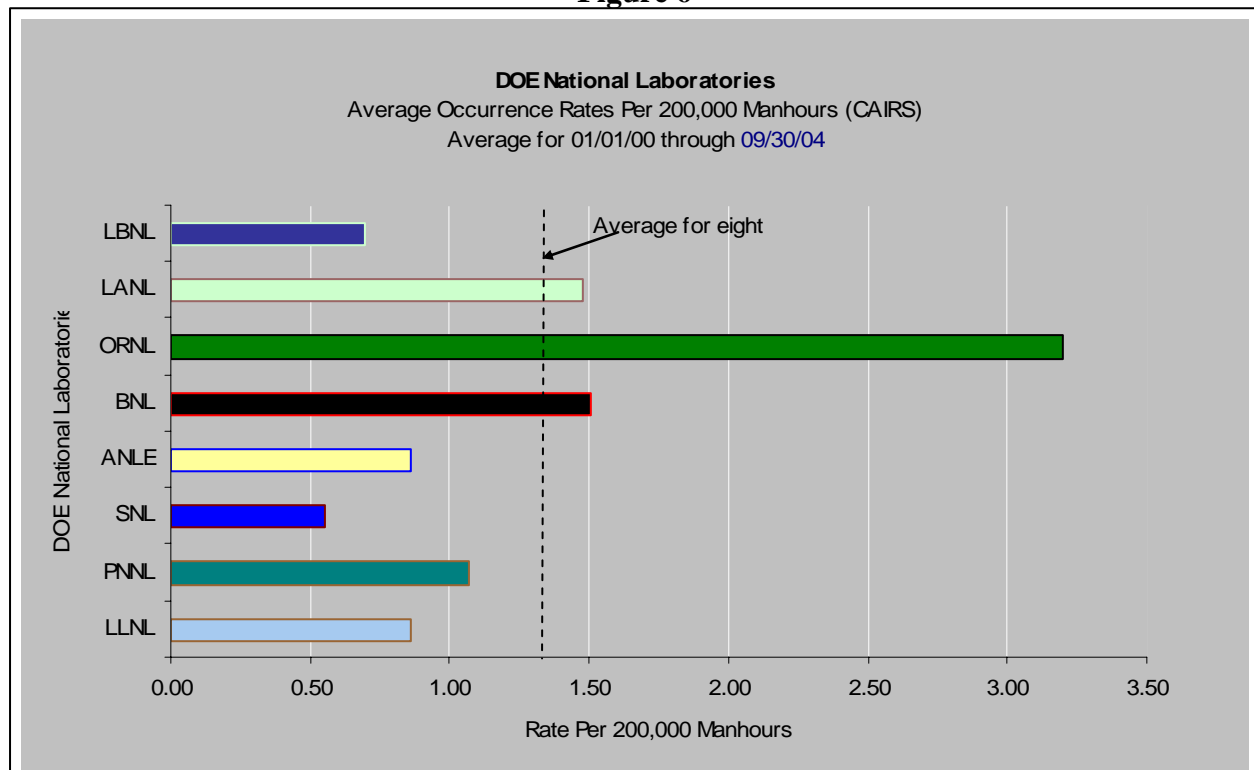


Figure 6 compares our occurrence incident rate per 200,000 man-hours to other DOE National Laboratories (based on CAIRS manhours).

PNNL rates below “average” in this data comparison (note that it covers a different period of time than the previous chart; due to availability of data from CAIRS). Three of the Labs have higher occurrence rates (BNL, ORNL and LANL) and four are lower (ANL-E, LBNL, LLNL and SNL). PNNL’s average for this 3 year period was 1.09.

**Figure 6**



In addition to the above, the workbook used to generate these graphs also includes worksheets depicting occurrence rates per Directorate and by Core facilities.

**Performance Analysis:**

DOE M 231.1-2, paragraph 5.8, Performance Analysis and Identification of Recurring Occurrences, states, "Each contractor...must perform ongoing, but as a minimum quarterly, analyses of events during a 12-month period to look for trends. This periodic performance analysis must evaluate occurrences of all significance categories plus contractor-/operator-determined non-reportable events in order to prevent serious events from occurring. Quarterly performance analysis results must be reported to contractor and DOE line management in order to achieve improvements."

This analysis and trending evaluates incidents categorized as reportable through ORPS and non-reportable incidents as well; including all incidents telephoned into the PNNL single point of

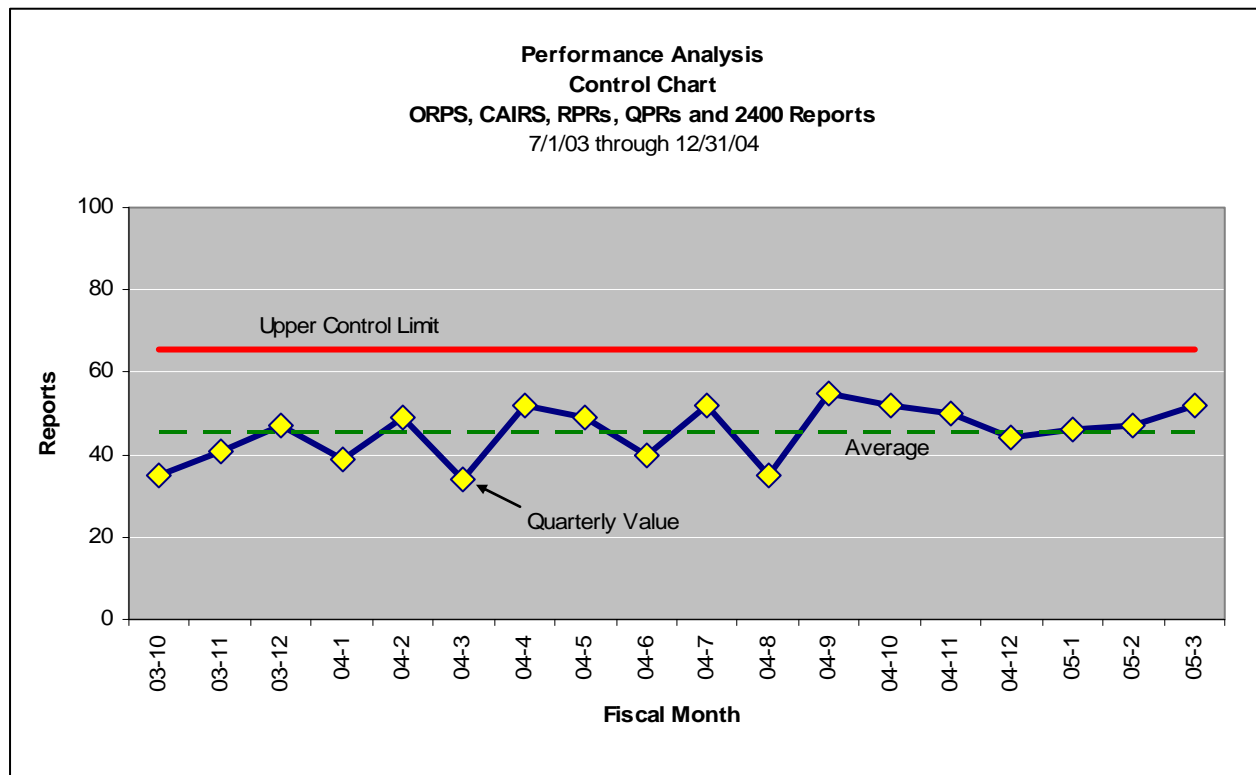
contact (375-2400), CAIRS reports, QPRs and RPRs. An Excel database has been developed to assist in the analysis. The Workbook is available to the reader at [\\Pn120\public\\_access\ONE\05-1 Perf Analysis.xls](\\Pn120\public_access\ONE\05-1 Perf Analysis.xls). The file contains a control chart (reproduced below), and various worksheets and charts included under tabs entitled: Criteria, Criteria\_Subgroups, Bldg-Criteria, Criteria-Bldg, Report\_Type (which includes control charts for each of the report types: ORPS, CAIRS, QPR, RPR, 2400), Bldg-Report\_Type, Report\_Type-Bldg, etc.. The purpose of the permutations is to afford the reviewer with a visualization tool to pick up on any apparent trends in each of those areas. The control charts are included to show any statistically significant trends.

During the past 18 months there have been 43 ORPS reports (occurrences), 52 CAIRS reports, 148 RPRs, 67 QPRs, and 394 other calls that did not merit reporting through one of the four reporting systems (note: 05-1 QPR information was not available at the time of this publication). Of the 43 ORPS reports, 11 were also reportable as RPRs, 5 as QPRs, and 3 asf CAIRS reports.

Note: The Trend report analyzes reportable occurrence data from 10/01/01 through 12/31/04. The Performance Analysis; however, covers all reportable and non-reportable events for just the prior 18 month period ending 12/31/04.

Figure 7 represents the Performance Analysis and Trending Report Control Chart.

**Figure 7**



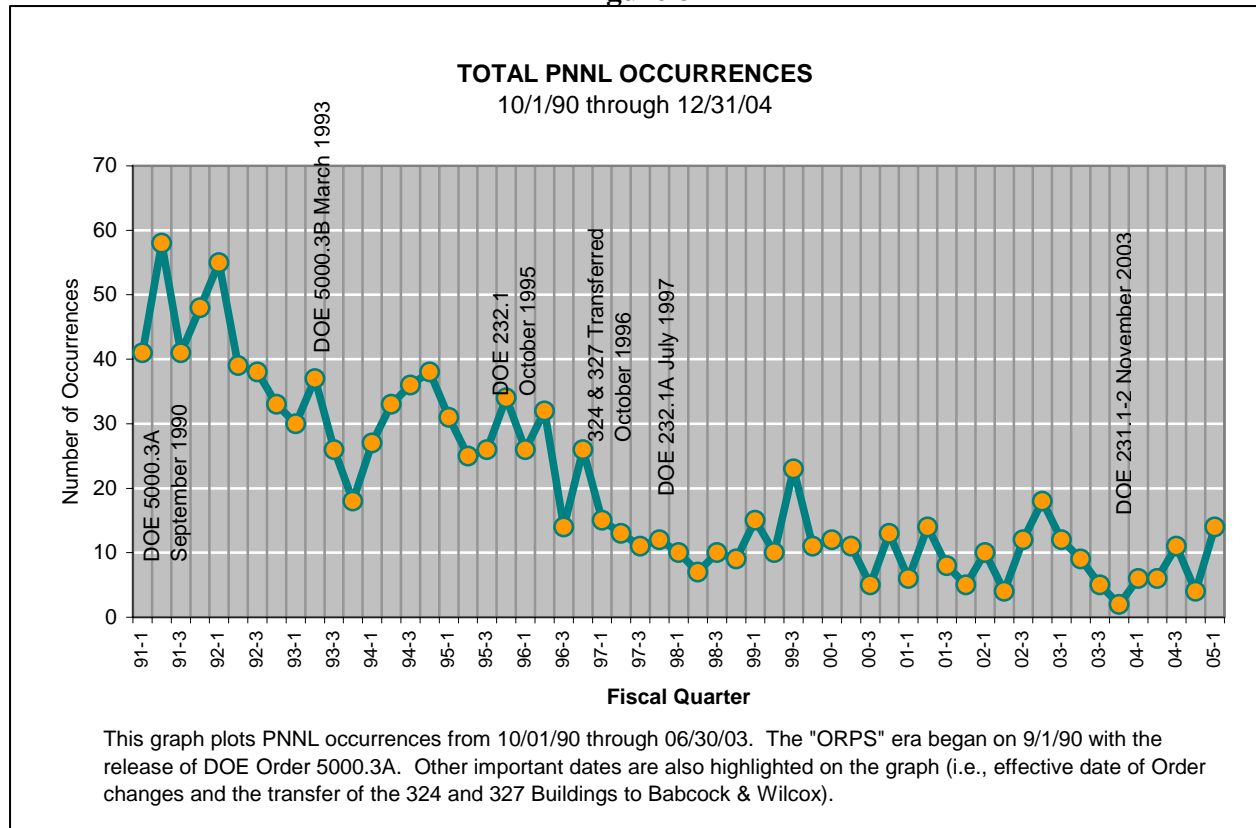
This control chart indicates that there are no statistically significant or noteworthy trends in these data streams that would suggest further consideration for categorization as a management



concern for a recurring issue (SC-R categorization). As noted above, the analysis included review of each subgroup (ORPS, CAIRS, QPR, RPR and 2400 Reports), to see if any of the “report types” individually or collectively produced any trends of concern. None were found.

And lastly, for a historical perspective on PNNL occurrences see Figure 8. It charts the number of occurrences by quarter since the inception of “ORPS,” and includes dates of notable changes in the DOE occurrence reporting orders, as well as the transfer of two nuclear facilities (324 and 327).

**Figure 8**



**Conditions:** None

**Assessment Rating:**

Select	Rating Criteria	Rating
X	Performance in the assessment category generally meets or exceeds requirements and performance expectations. May have deficiencies.	Green
	Serious deficiencies (compliance and performance) exist.	Yellow
	Significant improvement is required.	Yellow
	Immediate action is required to mitigate hazards and/or to protect the environment and safety and health.	Red
	Significant programmatic breakdowns exist.	Red