

Quality Management Office

Brookhaven National Laboratory

Quarterly Performance Report

Third Quarter CY 2004

November 8, 2004

Revision 1

Prepared by:  Date: 11/08/04
E. Sierra, ORPS Coordinator &
S.A. Scocca, QMO Staff

Reviewed by:  Date: 11/08/04
B. Miller, Issues Management
QMO Section Leader

Approved by:  Date: 11/08/04
R. H. Lebel, QMO Manager

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I. Executive Summary

This report, covering the third quarter of the calendar year, is the fourth edition of the Occurrence Reporting and Processing System (ORPS) Quarterly Performance Analysis and Summary. This report is developed and issued by the Brookhaven National Laboratory (BNL) Quality Management Office, as required by Department of Energy (DOE) Order 231.1A, *Environment, Safety and Health Reporting*.

During the third quarter of CY 2004, the Quality Management Office reviewed 69 issues and/or potential issues from the following documented sources:

- Occurrence Reports;
- ORPS nonreportable events logged by ORPS Categorizers;
- Radiological Awareness Reports (RARs);
- Nonconformances assigned an ESH&Q Risk Level of High (A1- Critical) or Moderate (A2 - Major);
- Procurement Nonconformances;
- Institutional Assessment Tracking System (ATS) conditions entered.

Analysis of the data included in this report indicated an increase in the number of events/conditions involving equipment/material problems. This analysis concluded that the events/conditions are unrelated lower level events and that a recurring occurrence report is not warranted (e.g., oil leaks from underground storage tanks, multiple nonreportable minor antifreeze and oil spills, and other unrelated lower level events).

Areas Receiving Management Attention

Utility Strikes: Twenty utility strike events have occurred from January 1, 2000 to the end of the third quarter of CY 2004. Six of these events were reported to DOE via the ORPS reporting process; the other events did not reach the ORPS reporting threshold as determined by the BNL ORPS Categorizers. BNL had three utility strike events in CY 2004, one reaching the ORPS reporting threshold. The ESH&Q Assistant Laboratory Director will request that Plant Engineering prepares a presentation to the ORPS Categorizers so that they may decide whether there is a recurring condition at BNL warranting a recurring “R” ORPS report, or if additional follow-up actions should be considered (see section III. Performance Analysis for details).

Material Handling: Occurrence report CH-BH-BNL-BNL-2004-0005 “Recurring Material Handling Problems,” was declared on March 24, 2004. During the third quarter of CY 2004, a DOE assessment of the BNL Integrated Safety Management (ISM) System was conducted and it identified many of the same material handling, personnel training, and qualification issues identified previously by BNL, as well as

other areas of concern, involving hoisting and rigging. As a result of this assessment, the Laboratory Deputy Director of Operations appointed a Hoisting, Rigging, and Mechanical Material Handling Safety Committee to revitalize BNL's Hoisting and Rigging Program. The committee is charged with reviewing recent hoisting, rigging, and mechanical material handling events and accidents; reviewing previous and interim corrective action plans; developing a single comprehensive corrective action plan; recommending/implementing corrective actions to improve hoisting, rigging, and mechanical material handling operations throughout all Departments/Divisions at BNL; and assisting BNL management in instituting the necessary changes to conduct of operations in this area. The "Recurring Material Handling Problems" ORPS report will be updated to reflect the results of this assessment and to include additional corrective actions to address new areas of concern if applicable (see section III. Performance Analysis for details).

Background

DOE revised their ORPS Program in CY 2003. The revised program is intended to reduce nuisance reporting, clarify confusing reporting criteria, and place a new emphasis on performance analysis. Implementation of the revised DOE ORPS Program was initiated at BNL on November 10, 2003. At that time, a four-phased approach to performance analysis was developed with a corresponding implementation plan. The BNL ORPS Coordinator and the DOE Brookhaven Site Office (BHSO) ORPS Coordinator meet weekly to discuss the status of the ongoing ORPS implementation plan and the overall BNL ORPS Program.

The purpose of the performance analysis is to ensure that recurring events are identified. Guidance concerning the identification of recurring events is provided in DOE Guide 231.1-1, *Occurrence Reporting and Performance Analysis Guide*. The following examples of questions are considered indicators of a recurring event: Did related events having the same underlying cause occur within a single facility or operation? Did the trending data for a series of events indicate a significant negative trend? Did related series of events breach multiple barriers protecting workers, the public, or the environment from potential or actual adverse impacts? Events identified as recurring will be processed as a significance category "R" recurring occurrence report.

A performance analysis will be conducted quarterly and include a review of ORPS and non-ORPS events/issues over a 12-month rolling year. The ORPS Quarterly Performance Analysis will identify recurring/programmatic issues, if any exist. In addition to a performance analysis, this report will include an ORPS Quarterly Summary.

II. Introduction:

The ORPS Program is intended to: 1) ensure the timely collection, reporting, analysis, and dissemination of information on environmental, safety, and health issues, and 2) ensure the Department of Energy (DOE) and National Nuclear Security Administration (NNSA) are informed of events that could adversely affect the health and safety of the public or workers, the environment, the intended purpose of DOE

facilities, or the credibility of DOE. The ORPS Quarterly Performance Analysis and Summary is performed to identify possible recurring program deficiencies and describe ORPS program activities at the Laboratory. If a recurring program deficiency is identified, it will be reported to DOE via a significance category “R” recurring occurrence report. Section III of this report includes a summary of the documents reviewed and a performance analysis of the issues/events reviewed. Section IV summarizes the ORPS Program activities for the third quarter of CY 2004.

III. Performance Analysis

The following exhibits provide a summary of the issues reviewed for the third quarter of CY 2004, including a summary of the documents reviewed and trend analysis.

A. Document Review Summary:

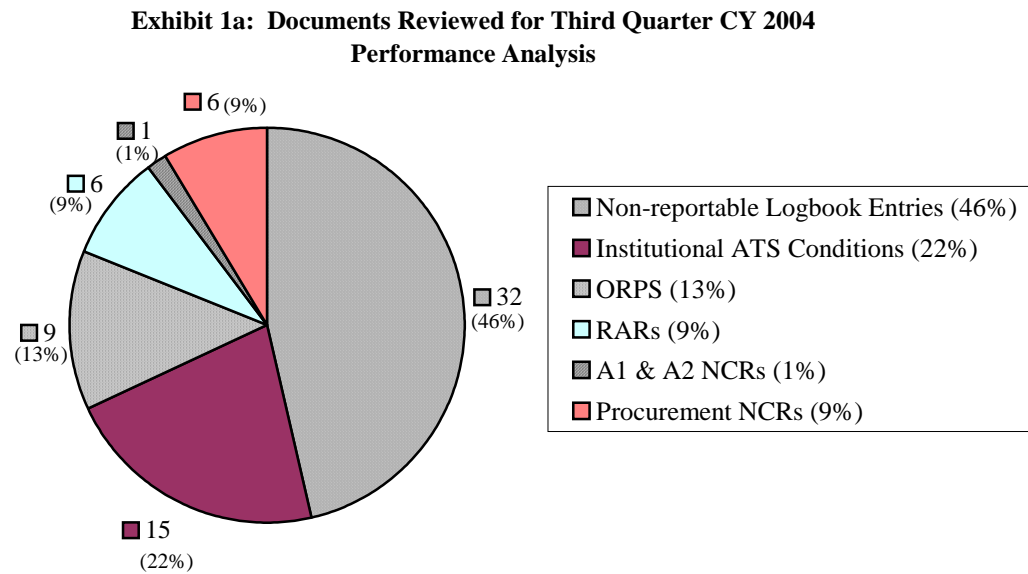


Exhibit 1a indicates 69 documents were reviewed for the third quarter performance analysis of CY 2004. Approximately 46% of the documents reviewed were ORPS nonreportable logbook entries made by the eight BNL on-call ORPS Categorizers. One of the nonreportable logbook entries was also captured as a Radiological Awareness Report (RAR). There was one A2 nonconformance report reviewed.

Note: The eight BNL ORPS Categorizers are a cadre of volunteer senior personnel who have received significant training on the reporting criteria of *DOE Manual 231.1-2, Event Reporting and Processing of Operations Information*. They are on a

rotating schedule, and are available 24 hours a day, 7 days a week to determine event reportability. Each determination that a categorizer renders is logged with justification. It is important that BNL staff draw upon the categorizer’s expertise shortly after event/condition discovery so that a timely, accurate, and consistent determination of ORPS reportability is rendered.

Exhibit 1b: Documents Reviewed per Quarter

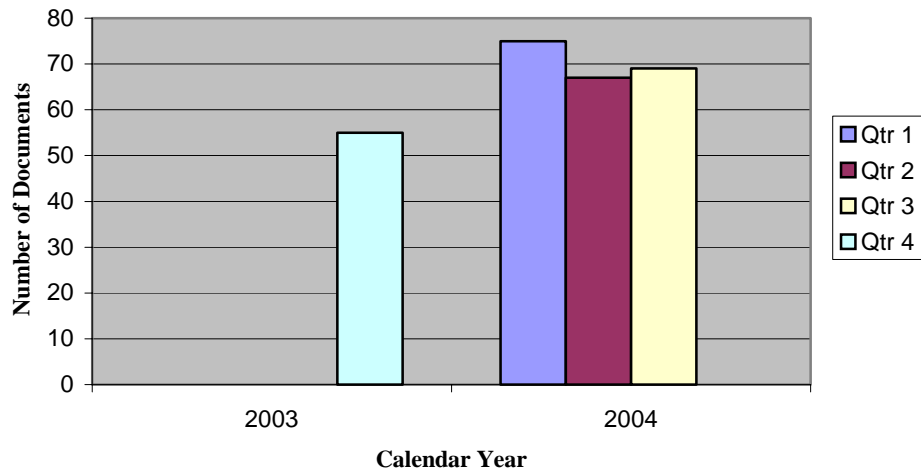


Exhibit 1b depicts the number of documents reviewed per quarter from the fourth quarter of CY 2003 through the third quarter of CY 2004. On average, 67 documents per quarter have been reviewed.

Exhibit 2: ORPS Reportable and ORPS Nonreportable Logbook

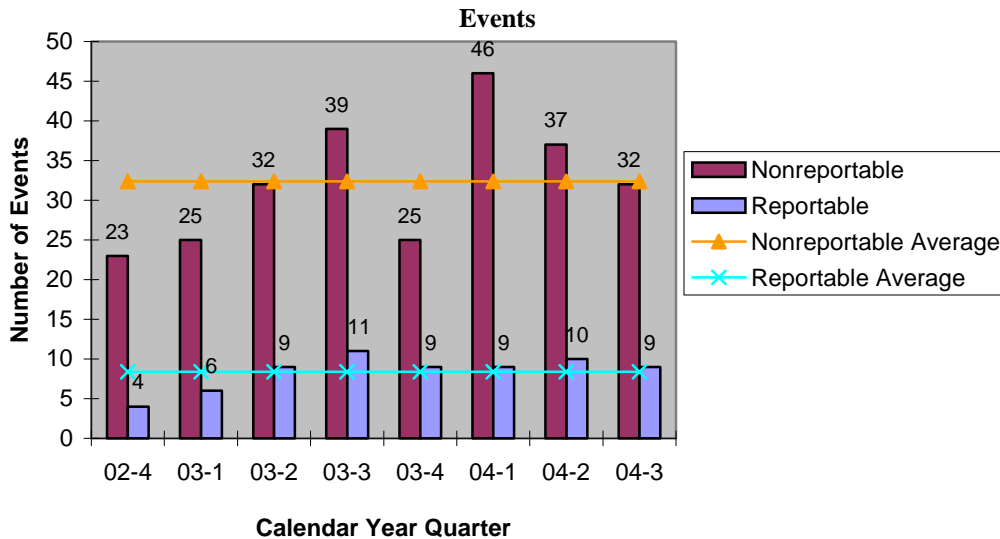


Exhibit 2 shows the number of ORPS reportable events and events/conditions evaluated by the BNL ORPS Categorizers and subsequently determined to be non-reportable per quarter from the fourth quarter of CY 2002 through the third quarter of CY 2004. As mentioned in previous quarterly reports, BNL commissioned an

independent multidisciplinary tasks force to review the upward trend observed in October 2003. It was concluded that there were no PAAA noncompliance issues and that any additional actions taken be included in directorate self-assessment plans.

Exhibit 3: Distribution of ORPS Reports by Reporting Criteria

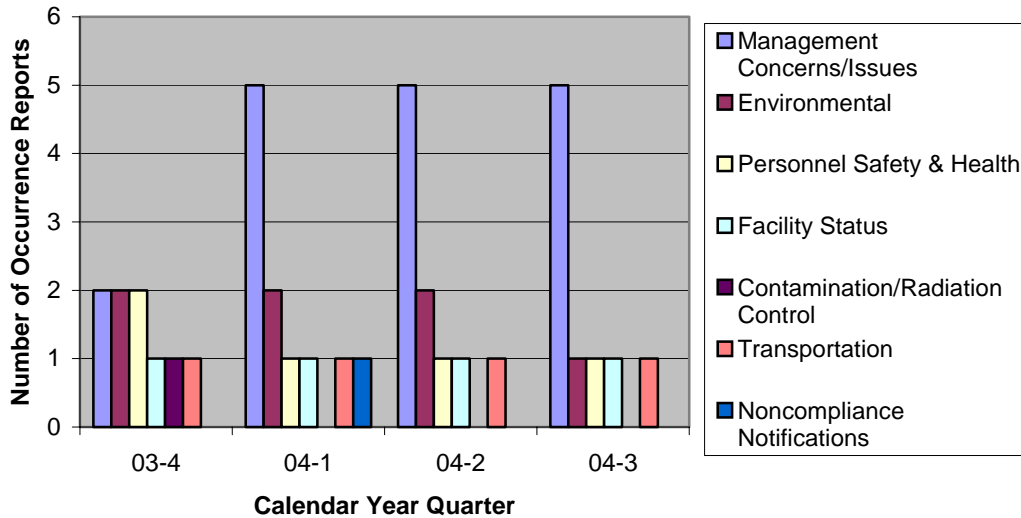


Exhibit 3 is a trend of BNL ORPS reports coded by categories defined in the Reporting Criteria.

Note: The Management Concerns/Issues category includes “near miss, where no barrier or only one barrier prevented an event from having a reportable consequence” and “an event, condition, or series of events that does not meet any of the other reporting criteria, but is determined by the Facility Manager or line management to be of safety significance or of concern to other facilities or activities in the DOE complex.” Due to the varying scopes of work and the interpretive differences for determining “management concern,” reporting under this (for the most part) otherwise “gray” area criterion is not always readily discernible and the ability to categorize events/conditions under this criterion indicate a proactive reporting culture at BNL.

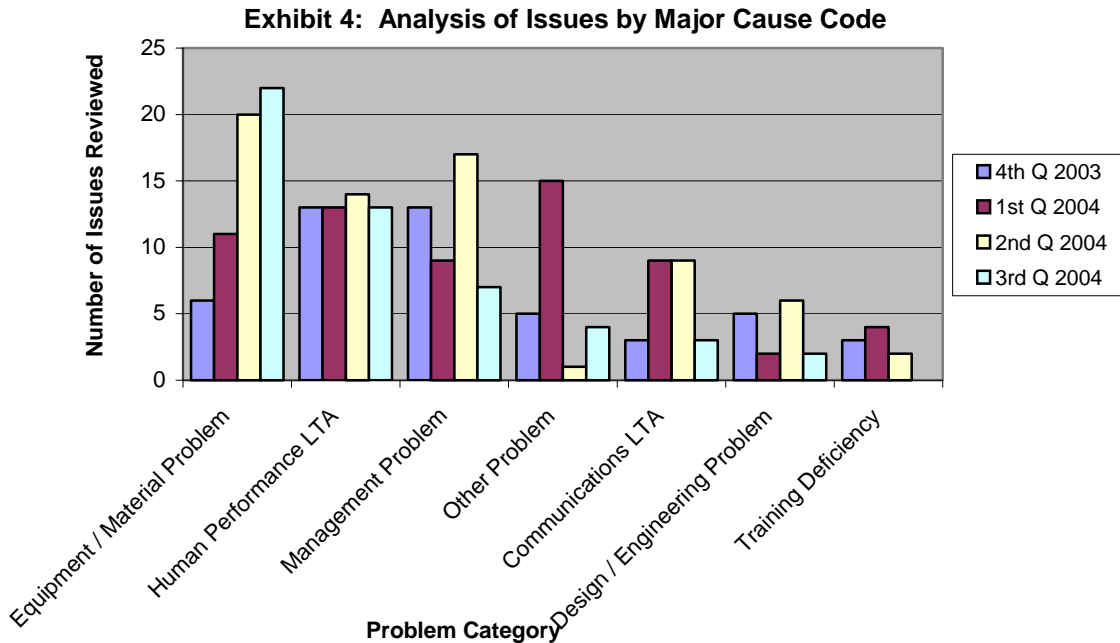


Exhibit 4 is a trend of ORPS cause codes from the fourth quarter of CY 2003 through the third quarter of CY 2004. The associated issues were reviewed and apparent cause codes were assigned from the ORPS Causal Analysis Tree in the *DOE G231.1-2, Occurrence Reporting Causal Analysis Guide*. Some issues were assigned more than one cause, and some issues were determined to be of no significance and therefore were not assigned a cause code.

An increase in the number of incidents involving equipment/material problem was noted during the time period under investigation and resulted in further analysis as described below:

Equipment/material problem

During the third quarter CY 2004 the equipment/material problem code was cited more often than in the previous three quarters. Analysis reveals that 13 out of 22 (59%) of the initiating conditions/events had apparent causes related to defective or failed materials or parts. The remaining 41% had apparent causes related to preventive maintenance for equipment LTA (3), inspection/testing LTA (2), corrective maintenance LTA (1), material packaging LTA (1), and end of life failure (2).

It should be noted that during the second quarter 2004 the apparent causes related to defective or failed materials or parts was cited as 70%, as compared to 59% during the most recent quarter. Further analysis of the third quarter individual initiating conditions/events revealed that one occurrence report was due to oil leaks from underground storage tanks, and the remaining data consisted of multiple nonreportable minor antifreeze and oil spills, and other unrelated lower level events. **Based on this review, it was concluded that a recurring occurrence report was not warranted.**

Note: The following are the definitions of the cause codes as defined by the *DOE G231.1-2, Occurrence Reporting Causal Analysis Guide*:

- An equipment/material problem is defined as an event or condition resulting from the failure, malfunction, or deterioration of equipment or parts, including instruments or material.
- Human performance less than adequate refers to an event or condition resulting from the failure, malfunction, or deterioration of the human performance associated with the process. This category is intended for individual actions or lack thereof.
- Management problem refers to an event or condition that could be directly traced to managerial actions or methodology (or lack thereof). A “management” problem can be attributed to management methods (directions, monitoring, assessment, accountability, and corrective action), inadequate resource allocation, work organization and planning, supervisory methods, and/or change management practices.
- Other problems include problems caused by factors beyond the control of the organization (i.e., legacy radiological or hazardous material).
- Communications less than adequate refers to inadequate presentation or exchange of information.
- A design/engineering problem is an event or condition that can be traced to a defect in design or other factors related to configuration, engineering, layout, tolerances, or calculations.
- Training deficiency refers to an event or condition that could be traced to a lack of training or insufficient training to enable a person to perform a desired task adequately.

B. Utility Strikes

The “ORPS Quarterly Performance Analysis and Summary, 2nd Quarter CY 2004” identified electrical utility strikes as a new area, that warranted management attention. In response to that report, the ESH&Q Assistant Laboratory Director requested that the Quality Management Office conduct a review to determine if a potential recurring theme exists among utility strikes at BNL.

The assessment reviewed BNL utility strike data from January 1, 2000 to the end of the third quarter of CY 2004, to include ORPS reportable events and categorizer logbook information (ORPS nonreportable events).

Summary of Results:

- Twenty utility strike events have occurred from January 1, 2000 to September 30, 2004 (see exhibit 5). Six of these events have been reportable to the DOE ORPS; the other events did not reach the ORPS reporting threshold as determined by the BNL ORPS Categorizers. The following three utility strike events have occurred at BNL in CY 2004; CH-BH-BNL-PE-2004-0002, Electrical Utility (Encased in Concrete Floor) Conduit Strike, domestic water main strike (not reportable in ORPS), and communication cable severed during excavation work (not reportable in ORPS).

The ORPS reportable events were reviewed in several areas for possible recurring issues; causes, corrective actions, subcontractor involvement, and the criteria used to report the occurrence in ORPS.

- Personnel Error or Human Performance Problems was the cause category cited most often for the occurrences (see exhibit 6). ‘Procedure Not Used or Used Incorrectly’ was the cause most cited within Personnel Error.
- All six ORPS occurrences had procedural/instructional problems as one of the causes identified.
 - ‘Procedure Not Used or Used Incorrectly’ was assigned as a cause for four of the six occurrences.
 - ‘Defective or Inadequate Procedure’ and ‘Ambiguous Instructions/Requirements’ was each identified once as a cause.
- Corrective actions for five occurrences required a revision to a procedure.
 - Plant Engineering Excavation Procedure (EP-ES&H-801) was cited as a procedure to be revised in three different occurrence reports; CH-BH-BNL-PE-2000-0003 “Strike Underground Electric Cables - Roll up Report”, CH-BH-BNL-PE-2002-0005 “Minor Utility Strike During Horizontal Boring Operations”, and CH-BH-BNL-PE-2003-0001 “Communication Cable Struck During Excavation.”
- All six occurrences involved a contractor or subcontractor performing work.
- Five occurrences were reported in ORPS using either the ‘Near Miss’ or ‘Potential Concerns/Issues’ criteria.
 - ‘Safety Status Degradation’ was the criteria used to report one occurrence.

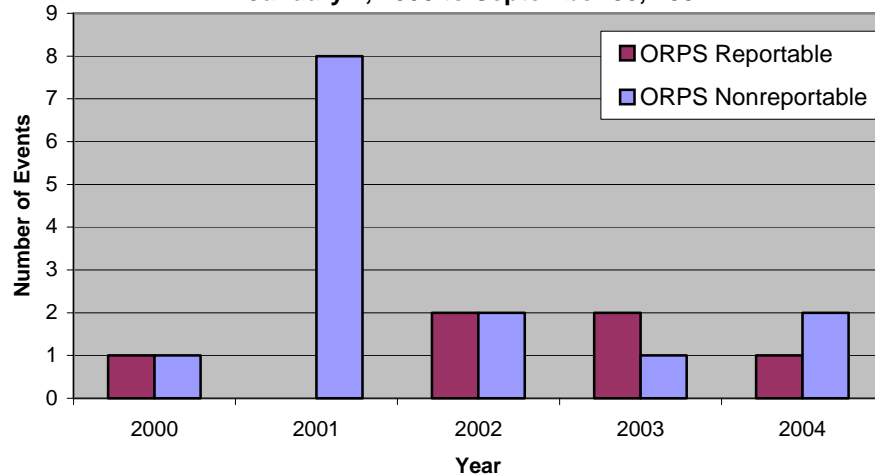
The Quality Management Office concludes that there is a potential recurring theme among the utility strikes at BNL. There appears to be a continuing issue regarding the use and adequacy of procedures.

Path Forward:

The ESH&Q Assistant Lab Director will request that Plant Engineering prepare a presentation to the ORPS Categorizers based on the above data, and any further data

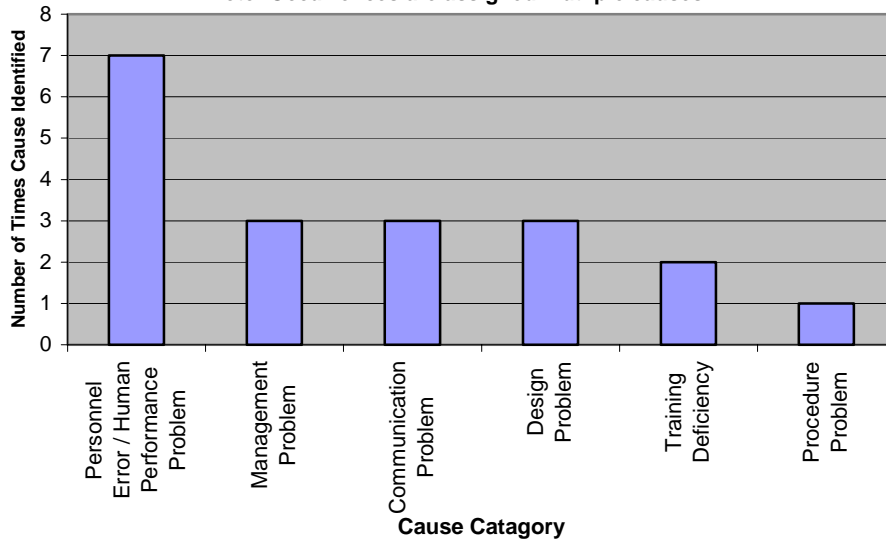
and information they may have regarding utility strikes. The presentation will assist the categorizers in a vote to decide whether there is a recurring condition at BNL warranting a recurring “R” ORPS report and/or additional follow-up corrective actions.

**Exhibit 5: BNL Utility Strike Events
January 1, 2000 to September 30, 2004**



**Exhibit 6: BNL Utility Strike ORPS Occurrence Causes
January 1, 2000 to September 30, 2004**

*Note: Occurrences are assigned multiple causes



C. Material Handling:

Occurrence report CH-BH-BNL-BNL-2004-0005 “Recurring Material Handling Problems,” was declared on March 24, 2004. During the third Quarter 2004, a DOE assessment of the BNL Integrated Safety Management (ISM) System was conducted and identified many of the same material handling, personnel training, and qualification issues identified by BNL in this ORPS report, as well as other areas of concern involving hoisting and rigging. As a result of this assessment,

the Laboratory Deputy Director of Operations appointed a Hoisting, Rigging and Mechanical Material Handling Safety Committee to revitalize BNL’s Hoisting and Rigging Program. The Committee is charged with reviewing recent hoisting, rigging, and mechanical material handling events and accidents; reviewing previous and interim corrective action plans; developing a single comprehensive corrective action plan; recommending/implementing corrective actions to improve hoisting, rigging, and mechanical material handling operations throughout all Departments/Divisions at BNL; and assisting BNL management in instituting the necessary changes to conduct of operations in this area. The “Recurring Material Handling Problems” ORPS report will be updated to reflect the results of this assessment and to include additional corrective actions to address new areas of concern.

IV. ORPS Activities

The following exhibit illustrates the status of BNL ORPS reports:

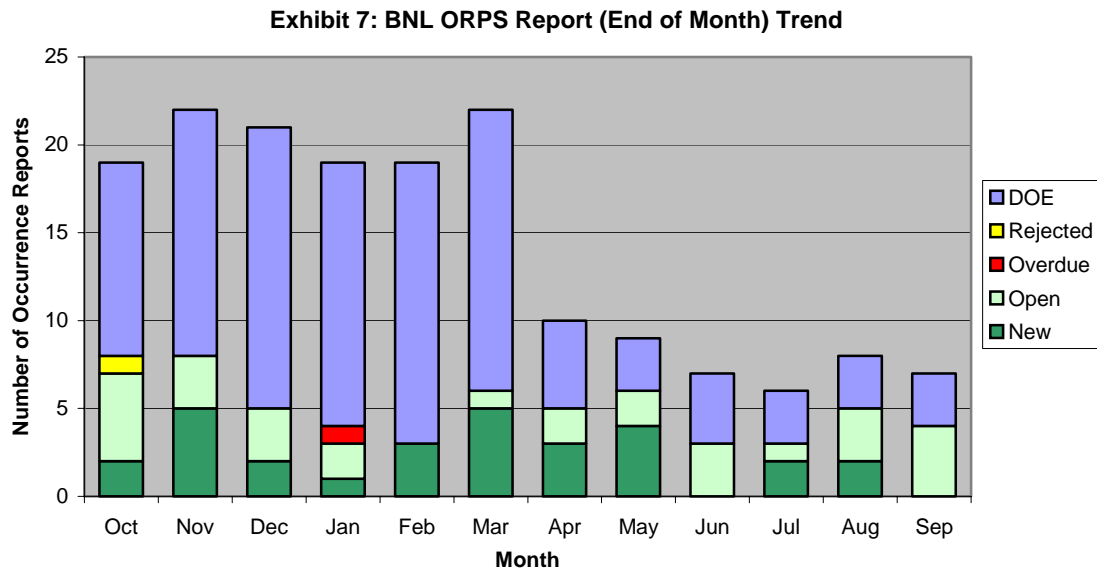


Exhibit 7 depicts the ORPS Report trend. Reports are shown in various states to include: awaiting DOE approval, rejected by DOE, overdue for submission to DOE, in progress (open), or new report issued. No adverse trend is noted.

The following is a summary of BNL’s Quality Management Office and ORPS Coordinator activities that have occurred during the third quarter of CY 2004:

- The BNL ORPS Coordinator and the DOE Brookhaven Site Office (BHSO) ORPS Coordinator meet weekly to discuss the status of the ongoing ORPS implementation plan and the overall BNL ORPS Program.
- The Environment, Safety, Health and Quality (Tier 1) Inspections Subject Area was developed and published (July 2004) to track and trend lower level issues to be included in future editions of this report. In addition, the Quality

Management Office will collect data from Tier 1 inspections and facilitate workshops to present the data as a lessons learned initiative per the Environment, Safety, Health and Quality (Tier 1) Inspections Subject Area.

- The ORPS Coordinator facilitated a quarterly Categorizer’s Workshop (#2004-02) on July 29, 2004. The goals of this workshop are to
 - Evaluate and improve the BNL Occurrence Reporting Program;
 - Maintain a baseline categorization process such that reportability decisions are both valid and consistent;
 - Continue to assimilate the new ORPS model.

- The BNL Quality Management Office issued the “Occurrence Reporting & Processing System (ORPS) Quarterly Performance Analysis and Summary, 2nd Quarter CY 2004” on August 17, 2004. One new area for management attention was identified regarding electrical utility strikes. In response to this new area for management attention, the ESH&Q Assistant Laboratory Director requested that the Quality Management Office determine if a potential recurring theme exists among utility strikes at BNL. The findings of the assessment and path forward are included in this report.

- The ORPS Coordinator attended a meeting to reconcile Occurrence Report CH-BH-BNL-BNL-2004-0005 “Recurring Material Handling Problems” and Nonconformance Tracking System Report NTS-CH-BH-BNL-2004-002 “Recurring Material Handling Problems” with the recent ISM Assessment Report on August 20, 2004. The need for an update to the ORPS/NTS reports to reflect additional areas of concern noted by DOE and additional corrective actions as a result of the assessment was discussed. The update of both reports is in preparation.

- During the week of August 23, 2004, the ORPS Coordinator facilitated a TapRoot causal analysis concerning “Worker Experiences Electric Shock” (Occurrence Report Number: CH-BH-BNL-NSLS-2004-0002) at the National Synchrotron Light Source. The analysis is complete. It is anticipated that the update/final ORPS report will be issued by November 19, 2004.

- During the week of August 23, 2004, the ORPS Coordinator participated in a REASON root causal analysis concerning “Transportation of Solidified Liquid Low-Level Waste” (Occurrence Report Number: CH-BH-BNL-BNL-2004-0013) in the Environmental and Waste Management Services Division. Decision Systems, Inc. facilitated the analysis. The analysis is complete. It is anticipated that the update/final ORPS report will be issued by November 8, 2004.

V. References

DOE Guide 231.1-2, *Occurrence Reporting Causal Analysis Guide*, August 2003.

DOE Manual 231.1-2, *Event Reporting and Processing of Operations Information*, August 2003.

DOE Order 231.1A, *Environment, Safety and Health Reporting*, August 2003.

Nonconformance Tracking System Report Number: NTS-CH-BH-BNL-2004-002, “Recurring Material Handling Problems.”

Occurrence Report Number: CH-BH-BNL-BNL-2004-0013, “Transportation of Solidified Liquid Low-Level Waste.”

Occurrence Report Number: CH-BH-BNL-NSLS-2004-0002, “Worker Experiences Electric Shock”

Occurrence Report Number: CH-BH-BNL-BNL-2004-0005, “Recurring Material Handling Problems.”

Occurrence Report Number: CH-BH-BNL-PE-2000-0003, “Strike Underground Electric Cables - Roll Up Report.”

Occurrence Report Number: CH-BH-BNL-PE-2002-0005, “Minor Utility Strike During Horizontal Boring Operations.”

Occurrence Report Number: CH-BH-BNL-BNL-2004-0005, CH-BH-BNL-PE-2003-0001 “Communication Cable Struck During Excavation.”

ORPS Project Implementation Plan.