QUALITY IN OCCURRENCE REPORTING

November 1996

Office of Operating Experience Analysis and Feedback (EH-33)

Office of Environment, Safety and Health

Department of Energy

Objectives

The Office of Operating Experience Analysis and Feedback, EH-33, has completed a fourth assessment of the quality and timeliness of event data in the Occurrence Reporting and Processing System (ORPS). This bulletin summarizes the results of that assessment [*A Quality Assessment of DOE's Occurrence Reporting and Processing System (ORPS) Database (Second Quarter Calendar Year 1996)*, October 1996]. Similar assessments were performed in 1993, 1994, and 1995. The assessment had the following objectives:

1. Evaluate the consistency and completeness of the occurrence report data reported by the line organizations in accordance with DOE Order (O) 232.1, *Occurrence Reporting and Processing of Operations Information* and its associated manual,
2. Identify issues that may contribute to incorrect or inconsistent reporting of occurrences at DOE facilities,
3. Provide recommendations for improving the overall quality of the data in ORPS,
4. Measure progress in occurrence reporting quality relative to the initial assessments, and
5. Measure progress in the timeliness of submittal of occurrence report data relative to the initial assessments, and provide recommendations for improvement.

The first four objectives of the project were addressed by conducting an audit of the ORPS database. The fifth objective was addressed by performing an analysis of the occurrence reporting cycle. In addition, other information resources within the DOE community (meeting notes, reports, etc.) were reviewed for related occurrence reporting issues that may be influencing the quality and timeliness of occurrence reports.

Analysis – Data Quality

ANALYSIS OF ORPS DATA

All occurrence reports (except for those reports containing UCNI data) that became final in the second quarter of calendar year 1996 (96-2 period) were identified. [Note: the 1993-1995 assessments selected final reports from the fourth quarter of 1992 (92-4 period), the fourth quarter of 1993 (93-4 period), and the first quarter of 1995 (95-1 period), respectively.] To address stakeholder comments requesting information on the quality of the most recent occurrence reports, the assessment was limited to reports that were initiated on or after January 1, 1995. An initial sample of 100 occurrence reports from the 96-2 report population was randomly selected. This sample population was further expanded with 18 additional reports (again randomly selected from the 96-2 report population); this action was taken to ensure that a representative sample of final occurrence reports processed during this period by the major field and operations offices involved in the occurrence reporting process were analyzed as part of this assessment. Although a number of the occurrence reports were initiated before DOE O 232.1 was issued (September 1995), the assessment criteria were based on the DOE O 232.1 reporting requirements.

In reviewing the sample population of 118 occurrence reports, the coded fields were compared with text descriptions to determine (i) how well the event was reported, (ii) whether the correct codes were selected, (iii) how well the text fields provided narrative description to allow the reader to clearly understand the event and critique the nature of occurrence and cause codes selected, and (iv) whether the corrective actions were clearly enumerated. The audit focused on those data fields that are frequently used for data searches, event characterization studies, and trend analyses.

The audit results were compiled and statistically analyzed using four separate scoring systems. The scores developed under each scoring system and for the individual assessment questions were normalized to 100 for ease of reporting (for example, a score of 100 indicates that the code/text field or the report is fully complete and internally consistent).

Results

Review Results

The results of this audit (Fig. 1) show that performance by the line organizations in providing complete and consistent occurrence report data has improved for the most recent occurrence reports. A sizable degree of variation does, however, continue to exist in the consistency and completeness of the occurrence report population. While no minimum acceptable score was established for the audit, the results continue to indicate the "average" final report is likely either to not contain required information or present conflicting information.

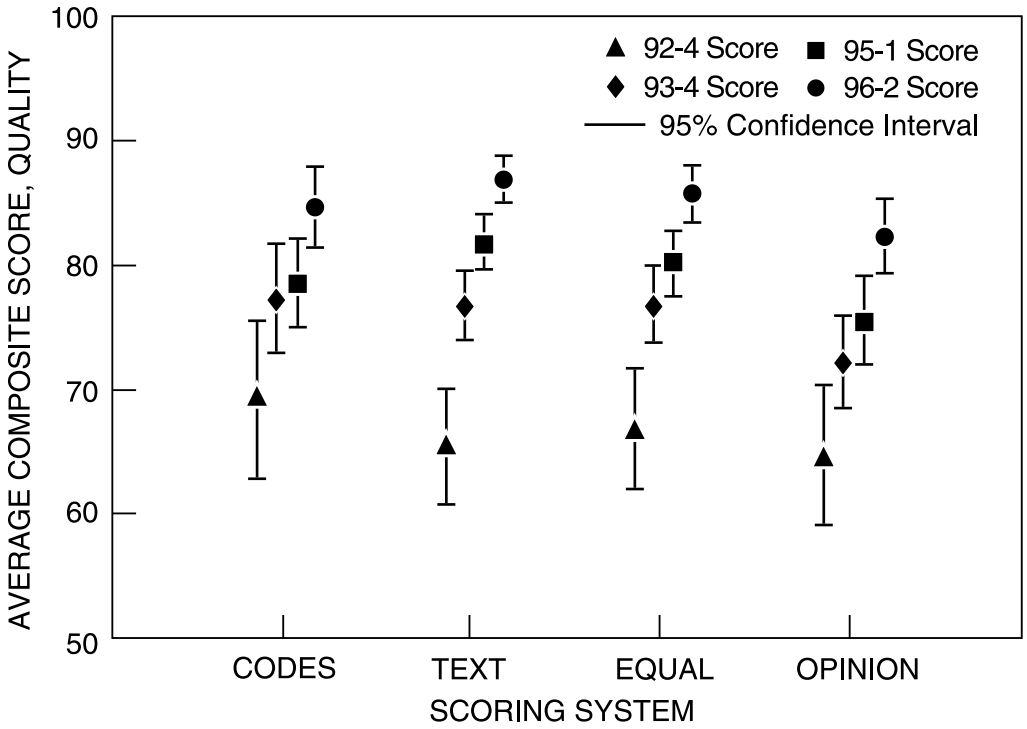

Fig. 1. Comparison of occurrence report composite scores (by scoring system).

Issues

Key issues identified from the audit that continue to impact the completeness and consistency of occurrence reports include:

- Weak or inconsistent descriptions of the occurrence, its cause (this field continues to most closely correlate with the overall quality of the entire occurrence report), and corrective actions,
- Use of undefined site-specific terminology, and
- Excessive use of "normal operations" in describing facility operating conditions and activity category.

Because the assessment criteria were essentially identical, the results of the 1994 and 1995 assessments were combined to provide additional insights on organizational performance relative to the most recent occurrence reports. From this effort, the following observations are noted:

Cognizant Secretarial Officer (CSO) Organizations (Fig. 2)

- The Environmental Management (EM) organization continues to exhibit statistically significant improvement in the quality of their occurrence reports as compared to the combined results from the 1994 and 1995 assessments. No specific factors influencing the improved EM performance were confirmed; however, possible explanations include (a) the transfer of additional DOE facilities (and personnel with improved occurrence report preparation skills) to EM, and (b) the benefits derived from continued sharing of occurrence reporting "lessons learned" through groups such as the Occurrence Reporting Special Interest Group (OR SIG).
- Improved performance was observed for the Defense Programs (DP) organization. Although no specific factors influencing DP's performance were confirmed, the results most likely reflect some of the improvements in report data quality noted in the "Field/Operations Offices" and "Contractors" discussion below.

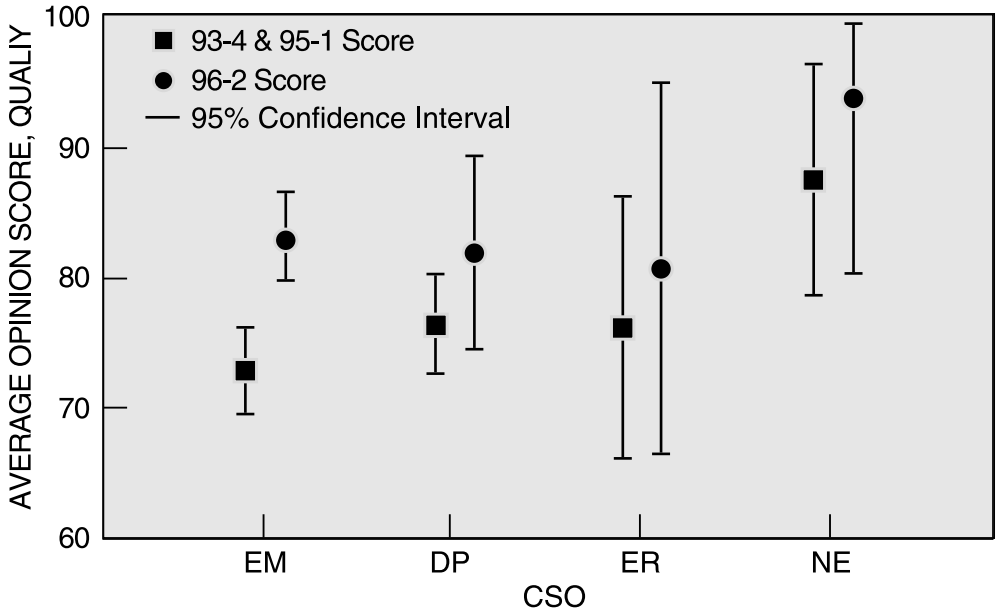

Fig. 2. Occurrence report average composite scores (opinion scoring system) by DOE Cognizant Secretarial Officer organization.

- The performance of the Nuclear Energy (NE) organization continues to appear to be better than the average. Again, no specific factors influencing NE's performance were confirmed; one possible explanation may, however, be the typically high quality of root cause analyses performed for events at reactor facilities.

Field/Operations Offices (Fig. 3)

- The differences observed during this assessment in the performance among the major field/operations offices involved in occurrence reporting were not statistically significant.

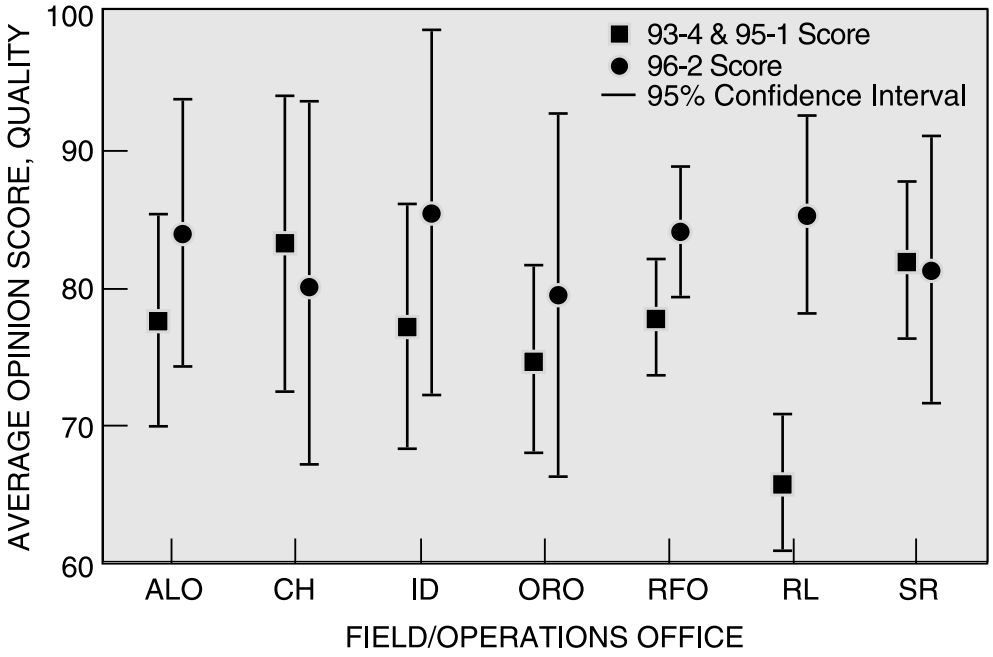

Fig. 3. Occurrence report average composite scores (opinion scoring system) by DOE field/operations office.

- The Richland Operations Office (RL) exhibited statistically significant improvement in the quality of their occurrence reports as compared to the combined results from the 1994 and 1995 assessments. While no specific factors influencing the improved performance were confirmed, there was some indication from contractor personnel at RL that increased attention to occurrence reporting had been given because of the 1995 EH-33 quality assessment results.
- Improved performance was observed at the Rocky Flats Field Office (RFO). The improvements observed can be attributed to more complete descriptions of the causes and corrective actions for the occurrences reviewed in this assessment.
- Performance at the Albuquerque (ALO), Idaho (ID), and Oak Ridge (ORO) Operations Offices may be improving; additional analysis will be needed to confirm if a trend exists.

Contractors (Fig. 4)

Note: In some cases, the acronyms listed represent the combined set of occurrence reports submitted by the different management & operating contractors that worked at the site during the 93-4, 95-1, and 96-2 periods.

- The differences observed during this assessment in the performance among the major DOE contractors involved in occurrence reporting were not statistically significant.
- Westinghouse Hanford Company (WHC) exhibited statistically significant improvement in the quality of their occurrence reports as compared to the combined results from the 1994 and 1995 assessments. The WHC performance mirrors the improved RL performance discussed above.
- Improved performance was observed for the management and operating contractors at Rocky Flats [Kaiser-Hill Rocky Flats (EG&G/KH-RF)], Los Alamos National Laboratory [University of California (UCAL-LANL)], and Pantex [Mason-Hanger (MH-Pantex)]. Again, the improvements observed appear to result from more complete descriptions of the causes and corrective actions for the occurrences reviewed in this assessment.

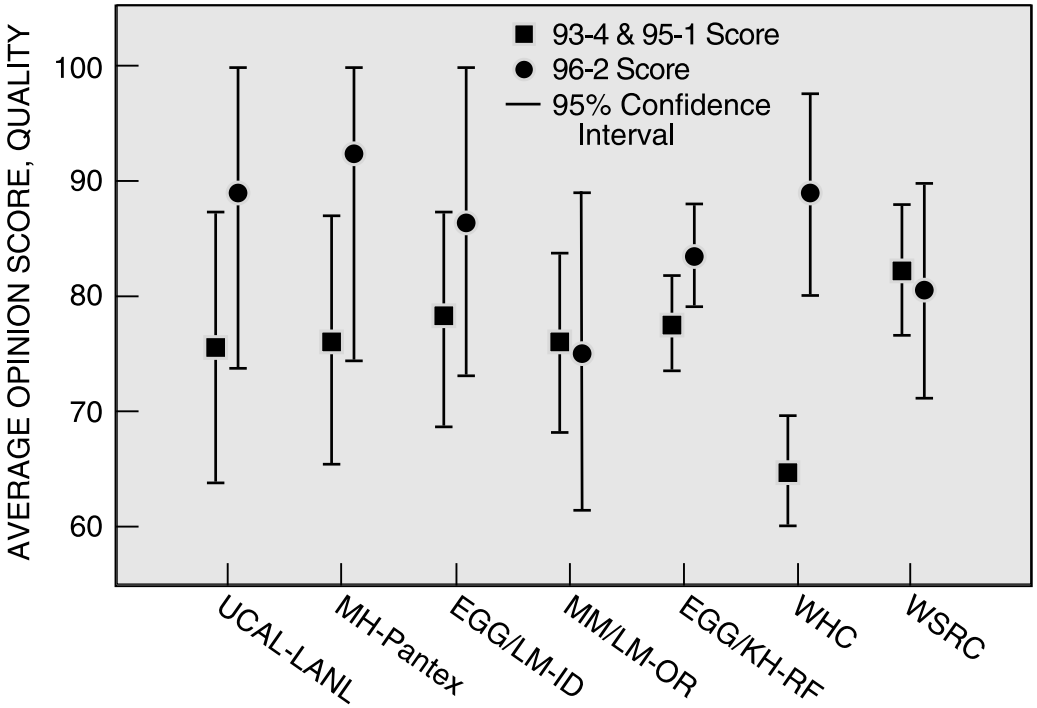

Fig. 4. Occurrence report average composite scores (opinion scoring system) by DOE contractor.

- Performance for the management and operating contractor at Idaho [Lockheed Martin Idaho Technologies (EG&G/LM Idaho)] may be improving; additional analysis will be needed to confirm if a trend exists.

Analysis – Timeliness

ANALYSIS OF OCCURRENCE REPORTING CYCLE

The timeliness of categorization, notification, submittal, and approvals of the entire population of final occurrence reports from the 96-2 period was analyzed (988 reports; UCNI reports excluded). It should be noted that the 1993-1995 assessments evaluated the time lags only for the sample population of reports selected for data quality analysis. Consistent with the previous assessments, the purpose of this task was to assess the timeliness (i.e., by evaluating the time lag between

required actions in the occurrence reporting process) of event categorization, notification reports, final reports, the Facility Representative's review/approval, and the Program Manager's review/approval.

Results

Review Results

- Approximately 76 percent of the categorizations of events were handled in the two-hour time limit specified in DOE O 232.1. Approximately 0.8 calendar days (19-20 hours) were required to achieve a 90 percent performance rate.
- Submittal of notification reports (required per DOE O 232.1 by the close of the next business day and not to exceed 80 hours) is usually done in a timely manner. (Note: "timely" is interpreted as a minimum of 90 percent of the submittals meeting the timeliness requirements in DOE O 232.1.)
- Approximately 44 percent of the final reports were submitted by Facility Managers on or before the 45 calendar day limit specified in DOE O 232.1. Approximately 327 calendar days were required to achieve a 90 percent submittal rate.
- Approximately 45 percent of the occurrence reports were approved by a Facility Representative on or before the 10 calendar day limit specified in DOE O 232.1. Approximately 95 calendar days were required to achieve a 90 percent submittal rate.
- Approximately 50 percent of the occurrence reports were approved by a Program Manager on or before the 14 calendar day limit specified in DOE O 232.1. Approximately 201 calendar days were required to achieve a 90 percent submittal rate.
- Approximately 25 percent of the occurrence reports moved from categorization to Program Manager approval within 69 calendar days. The 69 calendar day period is derived from the time limits for occurrence report processing in DOE O 232.1. Approximately 528 calendar days were required to achieve a 90 percent submittal rate.

Issues

Issues

Of the 988 non-UCNI reports finalized in this assessment period, only 25 percent were approved by a Program Manager within 69 calendar days of event categorization. Although the time to 90 percent submittal rate has improved, the percentage of reports issued on time has not improved. Approximately one-half of non-UCNI final reports from this period were not approved by the Facility Representative and Program Manager within the DOE O 232.1 time requirements of 10 and 14 calendar days, respectively.

As noted in the previous assessments, final occurrence report rejections by Facility Representatives or Program Managers are hidden contributors to the time lag for submittal of a final report by a Facility Manager. If a report is rejected at the Facility Representative or Program Manager level, the review time spent prior to rejection plus

the time required for resubmittal become a part of the Facility Manager Submittal time lag. Therefore, the performance of the Facility Manager is not directly represented.

	Mean (days)				Reports Submitted by 232.1 Requirements (%)				Time to 90% Submittal Rate (days)			
Time Lag	92-4	93-4	95-1	96-2	92-4	93-4	95-1	96-2	92-4	93-4	95-1	96-2
Discovery to Categorization	0.7	0.6	1.0	1.5	82	90	75	76	1	<1	1	0.8
Categorization to Notification Report	1.5	1.3	0.9	1.4	95	97	94	93	2	2	2	3
Categorization to Final Report Submittal by Facility Manager	199.4	250.8	199.4	122.3	50	25	50	44	560	800	715	327
Facility Manager Submittal to Facility Representative Approval	39.3	67.3	60.1	52.4	40	44	49	45	120	200	162	95
Facility Representative Approval to Program Manager Approval	64.6	68.9	43.6	60.5	13	51	59	50	180	220	165	201
Categorization to Program Manager Approval	303	387	302.9	235	13	14	25	25	620	1030	799	528

Fig. 5. Comparison of assessment results on occurrence report timeliness.

The timeliness of submittal of the occurrence reports analyzed in the four assessments was evaluated (Fig. 5). Some decrease was observed in most of the mean time lags and the time to 90 percent submittal rates; however, the mean time lag and time to 90 percent submittal rate between Facility Representative Approval and Program Manager Approval increased. The percentages of occurrence reports being processed by Facility Managers, Facility Representatives, and Program Managers within the DOE O 232.1 time limits appears relatively unchanged since the 1995 assessment. While no conclusions are drawn regarding the performance observed, some possible explanations may involve the following:

- The overall number of reports submitted to ORPS each calendar quarter is generally decreasing. With the decreasing activity in report processing, more time (and possibly management attention) may have been placed toward reducing the backlog of open occurrence reports, thus resulting in the lower average time lags and time to 90 percent submittal rates.
- Transfers of DOE facilities between CSO organizations may be requiring the designation of new Program Managers at DOE-Headquarters. Any delays encountered in identifying new Program Managers combined with the time needed by the new individuals in learning about the open occurrence reports for which they are now responsible could explain the increased report processing times observed.

Additional Issues

ADDITIONAL SIGNIFICANT ISSUES

Many DOE organizations and programs use the information in ORPS to develop data profiles and trending studies on performance issues related to their technical areas of interest. In the course of these

activities, significant quality issues have been identified that adversely affect trending and analysis of ORPS data complex-wide. From available reports, publications, and notes from the 1996 series of Customer Focus Meetings conducted by EH-33, the following additional issues were identified that may be influencing the quality and timeliness of occurrence reports.

- Variations in occurrence reporting practices among DOE sites exist. The variations usually stem from agreements between contractors and DOE line management concerning interpretations and requirements above and below those contained in DOE O 232.1.
- The "Number of Occurrences" field, established for reporting the actual number of occurrences in roll-up reports, is, in many instances, not consistent with the information in the report text. For example, a recent review of reports submitted to ORPS in the first quarter of 1996 identified an additional 78 occurrences not accounted for in the "Number of Occurrences" field.
- Nature of Occurrence (NOC) 10.C, "Potential Concerns/Issues," is being employed for some occurrences where other NOCs may be more appropriate.
- The role of the DOE Facility Representative in the occurrence reporting process is a continuing topic of discussion within the occurrence reporting community. Any problem encountered at the report processing interface between DOE contractors (i.e., Facility Managers or site occurrence reporting staff) and DOE Facility Representatives has the potential to adversely influence the quality and timeliness of reports submitted to the ORPS database.

CONCLUSION

Conclusion

Based on the information developed from this project, it is concluded that (1) improvements in the completeness, consistency, and timeliness of occurrence reports have been made, and (2) the need for additional improvements exists and must be pursued. The following general recommendations are provided.

Recommendations

Recommendations

- The quality of the "Description of Cause" field continues to have a high correlation with the overall quality of an occurrence report. Consequently, line managers should consider requiring DOE contractor personnel that serve as Report Originators or Facility Managers to receive formal training in Root Cause Analysis techniques. In addition, DOE personnel that serve as Facility Representatives and Program Managers should consider receiving training in Root Cause Analysis techniques to enhance their proficiency in evaluating the different types of and proposed dispositions for occurrences at DOE facilities. Also, where line organizations determine that their occurrence reports are consistently of poor quality or need improvement, additional Root Cause Analy-

sis training should be considered for the involved DOE or contractor personnel.

- When preparing an occurrence report, Report Originators and Facility Managers should review the body of the report and the cause codes selected against the "Description of Cause" field to confirm the consistency and completeness of the information being provided. Also, the selection(s) of "Nature of Occurrence" (especially 10.C), "Number of Occurrences," and any use of "Normal Operations" for the "Activity Category" and "Facility Operating Conditions" fields should receive extra attention to confirm their appropriate use. The "Checklist for Occurrence Report Review" developed by the OR SIG should be used when reviewing reports.

- Many "Roll-Up" reports have significant discrepancies between the number of occurrences reported in the "Number of Occurrences" field and the actual number of events discussed in the text of the report. These differences can and have adversely affected the efforts of DOE analytical initiatives, such as the DOE ES&H Performance Indicator (PI) Program. It is recommended that care be taken to update this field when preparing or updating roll-up reports. In addition, given the importance of the ORPS data and the analyses performed with the data, EH-33 is requesting action under separate correspondence to correct known discrepancies for specific occurrence reports.

- Only 25 percent of the non-UCNI final reports for the 96-2 period were approved by a Program Manager within 69 calendar days of event categorization. Comments received at the EH-33 Customer Focus Meetings suggest that the biggest barrier to timely reporting is Facility Representative and Program Manager review time and rejection. Facility Representatives and Program Managers have stated that the poor quality of reports has resulted in a high rejection rate. Consequently EH-33 will evaluate (1) possible ways to measure the time between when the Facility Representatives and Program Managers receive a report and either approve or reject it with comments, and (2) whether the time requirements are appropriate. Additionally, Facility Managers and Program Managers should evaluate their own performance and take the necessary steps to improve the timeliness of occurrence reports.

- Use of the training and guidance information prepared by the OR SIG should be promoted by the DOE occurrence-reporting community. Usage of these materials by Report Originators, Facility Managers, Facility Representatives, and Program Managers will likely improve the consistency and completeness of occurrence reports.

- In an attempt to provide relevant information in the "Division or Project" field, site-specific acronyms are frequently used. Site-specific acronyms used in any field should be spelled out in the "Description of Occurrence" field.

- As stated in last year's recommendations and discussed in the Customer Focus Meetings, each Headquarters organization, each field/operations office, and each contractor should be required to periodically (i.e., monthly or some other time period) identify its ten (10) oldest occurrence reports. The reasons for a particular report being late should be identified. This "top 10" listing could aid in identifying system-wide reasons for the delays in processing occurrence reports. EH-33 is willing to assist the line organizations in identifying these "late" reports since the listings could aid EH-33 in identifying system-wide delays in processing occurrence reports.

- A review of site-specific procedures for occurrence reporting practices is needed to ensure consistency in applying the reporting criteria in DOE O 232.1 at the working level. EH-33 is pursuing this issue through the revision to DOE O 232.1 currently in progress.

- Organizations should consider employing "local" quality improvement programs for enhancing the completeness, consistency, and timeliness of their occurrence reports. Elements of such a program would include (1) understanding the local process for producing occurrence reports (i.e., work process mapping), (2) ensuring that a sound root cause analysis program is in place for analyzing events, (3) using resources, such as the OR SIG checklist, for evaluating draft occurrence reports, (4) understanding how the quality of occurrence reports is measured locally and how the results are fed back into the process, and (5) developing and maintaining a positive (i.e., mutually supportive) working relationship with the DOE Facility Representative(s) and Program Manager(s). EH-33 is willing to assist any DOE or contractor organization that is interesting in setting up their own occurrence reporting quality improvement program.

EH-33 plans to conduct another ORPS quality assessment in FY 1997. Comments or questions on this assessment should be directed to Eugenia Boyle, EH-33, (301) 903-3393 (voice), (301) 903-2329 (fax), Eugenia.Boyle@hq.doe.gov (e-mail).

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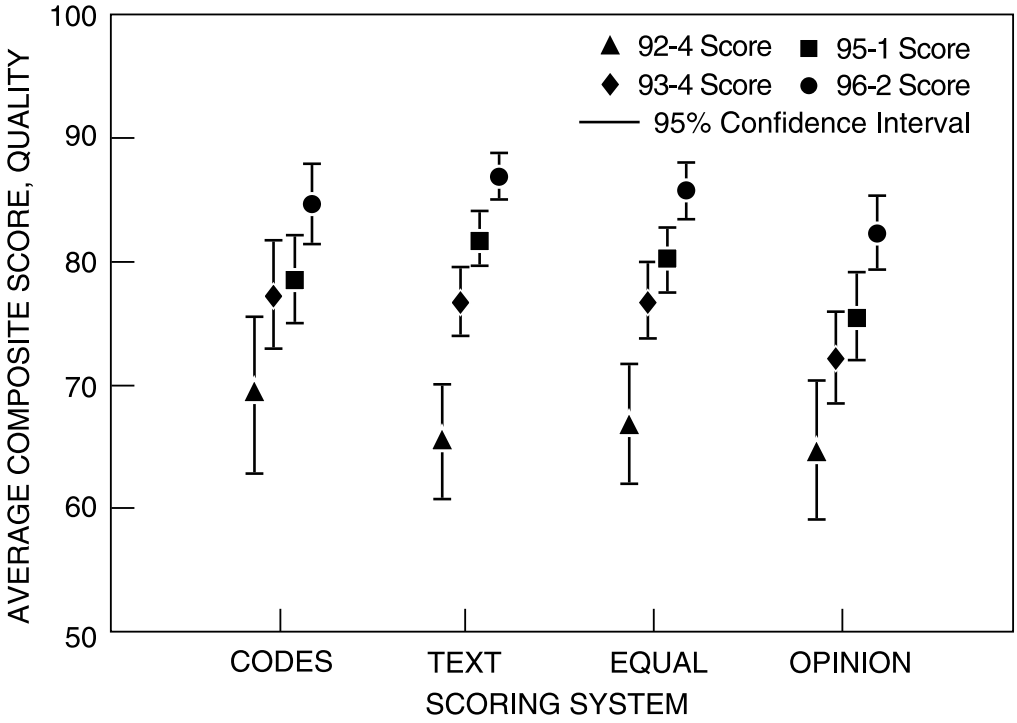
Summary

SUMMARY OF FY 1996 QUALITY ASSESSMENT

Data Quality

Data Quality Has Improved for the Most Recent Final Occurrence Reports Submitted in Accordance With Order 232.1.



Timeliness

The Percentage of Final Occurrence Reports Processed Within Order 232.1 Time Limits is Relatively Unchanged From Previous Assessments.

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Time Lag	92-4	93-4	95-1	96-2	92-4	93-4	95-1	96-2	92-4	93-4	95-1	96-2
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