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Los Alamos National Laboratory Yucca Mountain Site Characterization Project 1994 Quality Program Status Report

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LOS ALAMOS NATIONAL LABORATORY
YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT
1994 QUALITY PROGRAM STATUS REPORT

by

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ABSTRACT

This status report summarizes the activities and accomplishments of the Los Alamos National Laboratory (Los Alamos) Yucca Mountain Site Characterization Project's quality assurance program for calendar year 1994. The report includes major sections on program activities and trend analysis.

Program activities are discussed periodically at quality meetings by a representative group of support personnel, designated the "Q Team". In 1994, this team revised its charter, established vision and mission statements, and as a result of a self assessment, instituted a goal/performance process. The team also coordinated a myriad of program activities designed to improve existing processes or solve current problems. One of these processes involved members of the Q Team periodically running the quality meetings. This has been an excellent morale booster and has resulted in several unique approaches to running the team meetings. Another process improvement involved connection of all team members, including those in Las Vegas, NV, by electronic mail. This has greatly enhanced communications. However, the most time consuming activity was the revision of procedures in response to programmatic reviews of the requirements traceability network (RTN) matrix. Resolution of 130 comments resulted in 29 procedure revisions. Many of the revisions simply involved minor changes, although software, procurement, measuring and test equipment, and the data submittal processes required major procedural changes. In the training arena, minor problems were resolved and the electronic data base now works smoothly. To help reduce the frequency of minor deficiencies (i.e. deficiencies fixed during audits), a records management class was developed and offered. This class should result in fewer minor deficiencies for 1995 verification activities. Records personnel submitted 800 records to the Project's records repository, with a rejection rate of 0.0013% .

Personnel from the project office conducted one audit and two surveys of Los Alamos activities. Five corrective action reports (CARs) were issued. Los Alamos verification personnel conducted seventeen audits and sixteen surveys. This resulted in nineteen deficiencies. No major problems were recognized but there was an increase in deficiencies associated with lack of attention to detail. A mandatory training class was developed to address this issue. Individuals interviewed during the performance of audits were knowledgeable of quality assurance requirements and responsive to auditor inquiries.

Trend reports for 1994 were examined and are summarized herein. One open adverse trend, identified in early 1993, was closed. For the last four years, the number of both project and internal corrective action reports issued to Los Alamos personnel has decreased. This continues a favorable trend of decreasing annual deficiencies since 1990. This supports the view that Los Alamos personnel are meeting the quality requirements of the YMP and improving annually upon their performance.

1.0 INTRODUCTION

This status report is for calendar year 1994. It summarizes the annual activities and accomplishments of the Los Alamos National Laboratory (Los Alamos) Yucca Mountain Site Characterization Project (YMP or Project) quality assurance program (hereafter referred to as the quality program). By identifying the accomplishments of the quality program, we establish a baseline that will assist in decision making, improve administrative controls and predictability, and allow us to annually identify adverse trends and to evaluate improvements. This is the fourth annual status report (Bolivar, 1992; Bolivar, 1994; Bolivar, 1995).

Quality issues are discussed at quality meetings. Since many personnel are now more knowledgeable about the YMP and quality issues than they were in 1991, and since many of the major issues have been addressed, we were able to continue our meeting frequency of about once every quarter. These meetings are supplemented by smaller special process team meetings which are held as needed.

Attendance at quality meetings is mandatory for the contributors to this report. These individuals constitute the Q Team. At the beginning of each meeting, members summarize their accomplishments since the last meeting and identify any issues to be addressed. Any YMP personnel may bring any quality issue before the meeting for discussion. Discussions are resolved at the quality meeting or limited to one hour discussion per issue. If unresolved, the issue is assigned to a special process team. These teams comprise a smaller number of individuals who have expertise on the subject matter or who are affected by the issue. The Q Team discussions and consequent guidance, decisions, or philosophies are documented herein.

This report is divided into two primary sections: section 2.0 Program Activities and section 3.0 Trend Analysis. Under Program Activities, programmatic issues occurring in 1994 are discussed. The goals for 1994 (Bolivar, 1995) are also listed, followed by a discussion of their status. Lastly, goals for 1995 are identified. The Trend Analysis section is a summary of 1994 quarterly trend reports and provides a good overview of the quality assurance issues for the Los Alamos YMP.

1.1 Organization. Training, records, and document control activities do not administratively fall under the jurisdiction of the Quality Assurance Project Leader (QAPL). They are discussed herein because these activities are an integral part of the overall quality program, representatives from these activities attend quality meetings, and the QAPL and Administration and Control Project Leader work closely to ensure the needs of the Los Alamos YMP are met. A discussion of the Los Alamos YMP organization is thus included to clarify the responsibilities of these entities.

The Los Alamos YMP quality program consists of four organizations, which are managed by a Deputy Technical Project Officer (TPO) and three Project Leaders: the Test Coordination Office (TCO), with Ned Elkins (Deputy TPO) as head; Site and Regulatory Investigations led by Janet Mercer-Smith; Administration and Control, headed by Allyn Pratt (ACPL); and Quality Assurance, led by Stephen Bolivar. These staff report to the TPO Julie Canepa. Two additional Project Leaders, Ron Oliver, Test Planning and Design, and Richard Kovach, Field Test Coordination, were added in late 1994 to help manage TCO activities. These two report to the Deputy TPO.

Interactions between technical groups and the quality organization are normally handled by Quality Assurance Liaisons (QALs). Audit, survey and verification functions are administered by a Verification Coordinator, whereas a Software Coordinator handles configuration control of the software program. These positions report to the QAPL (Fig. 1). QAL responsibilities are

identified in Table I. During the year, Lyle Wichman assumed the duties as QAL of group EES-5 and became Corrective Action Report Coordinator. These changes were made to better distribute QAL duties. There has been a decrease of 1.5 QALs in the last three years, even though the technical scope of work has greatly increased. We were also able to eliminate the role of Resident File Custodian for group EES-13, a contract Training Specialist, a procedure editor, and a computer technician. There either was no longer a need for these services, or the duties were assumed by other personnel.

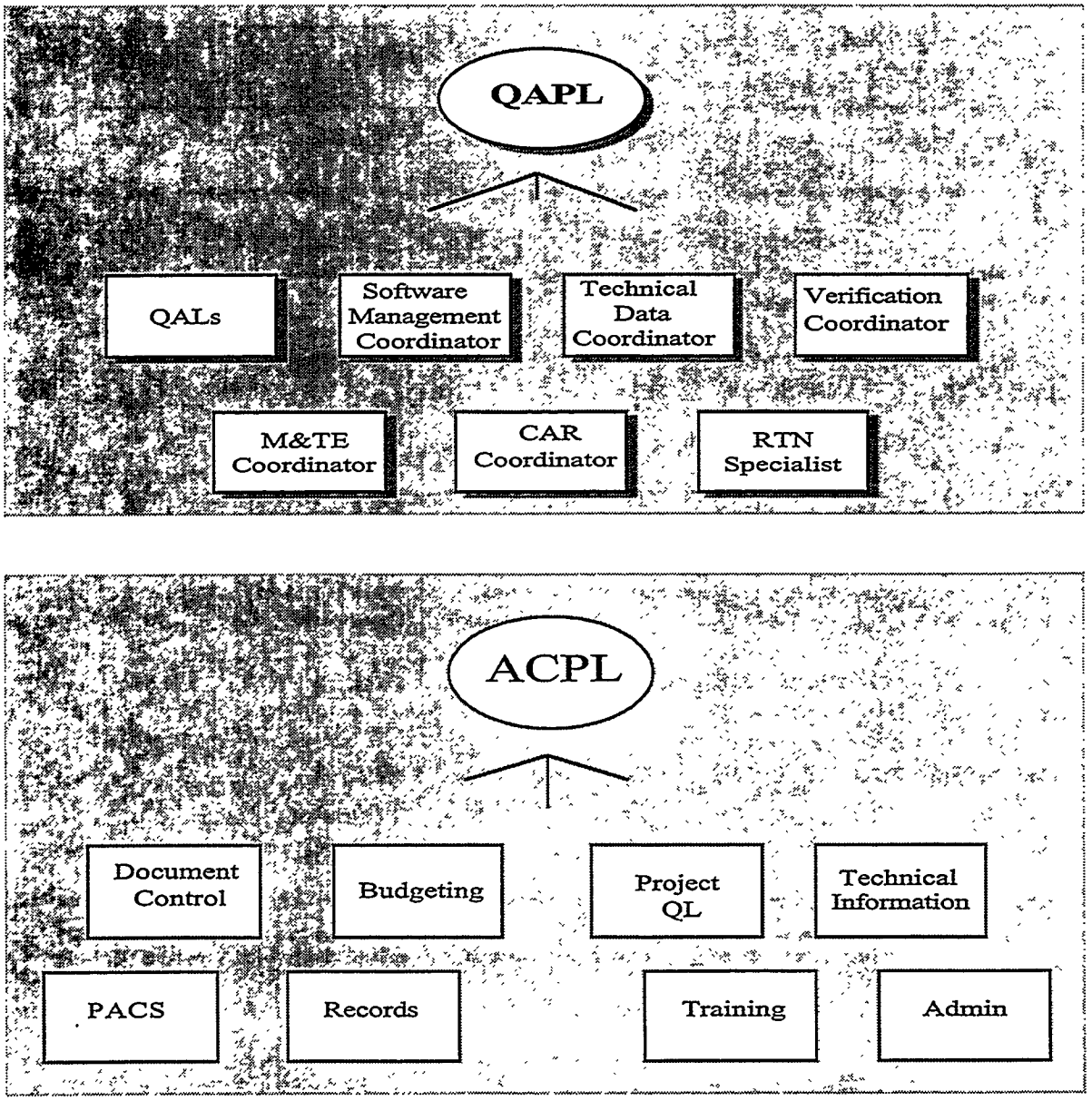


Fig. 1. Organizational Reporting Responsibilities (acronyms: QALs = Quality Assurance Liaisons; M&TE = measuring and test equipment; CAR = corrective action report; RTN = requirements traceability network; QL = quality liaison; PACS = project analysis control system; Admin = administration).

Table I. Quality Assurance Liaison (QAL) Responsibilities.

Person	Responsibilities
Andrew Burningham	Group EES-13/TCO; Group EES-13/LV Volcanism; Subcontractors: University of New Mexico, University of California (Riverside),and Golder Associates.
Mike Clevenger	Group EES-13; Deputy QAPL.
Richard Shay	CST Division; Subcontractors: HydroGeoChem, Stanford University, and Lawrence Berkeley Laboratory; M&TE Coordinator.
Lyle Wichman	Groups EES-1, EES-4, EES-5, EES-15 and LS-2; Corrective Action Report Coordinator.

Training, Records, Project Analysis Control System (PACS), and Document Control Coordinators report to the ACPL. So do Resident File Custodians (RFC) who maintain the resident files where quality records are stored. Because the YMP requires dual storage of quality records, the Records Coordinator maintains a Records Processing Center (RPC) where the second set of records is kept. These relationships are depicted in Figure 1.

Personnel changes, most being effective by May 31, include the addition of Jim Young as Verification Coordinator, Jeff Walterscheid as Technical Data Coordinator, and Lyle Wichman as the Corrective Action Coordinator. Bradley Gundlach became Software Coordinator after Chris Mechels retired. Betty Romero assumed Quality Concerns duties and Martin Herrera hired on as a Quality Assurance Engineer. In August, Ned Elkins became Deputy Group Leader of group EES-13. In October, Martin Herrera became Technical Data Coordinator. Lastly, in December, Jane Poths became Technical Coordinator for Geochemistry.

In 1994, 141 people were involved in the Los Alamos YMP, although not all were full time equivalents. Of these 141, 124 were involved in quality activities, i.e. activities governed by the Quality Assurance Requirements and Description document. Table II shows Los Alamos YMP personnel categorized by Los Alamos group for 1994.

Table II. Laboratory Groups and YMP Personnel.

Groups	Q Activity	Non-Q Activity
Earth and Environmental Sciences (EES) Division	34	2
Program Management and Test Coordination Office	32	10
Chemical Science and Technology (CST) Division	24	2
Other Divisions	7	1
Contractors	27	2
Totals	124	17

2.0 PROGRAM ACTIVITIES

2.1 Program Development. Most program development activities are initiated and discussed in quality meetings. Action items are assigned to individuals, and their status is tracked via an action item data base. This data base is used to verify that items are resolved. Action items may cover simple tasks, such as notifying an investigator that training is due, to more involved tasks such as revising a procedure. The status of open items is discussed at each quality meeting. In 1994, 255 action items were addressed.

In 1991, about twenty-five quality meetings were held. In 1992, the frequency was reduced to about one per month. We met five times in 1993 and 1994. These quarterly meetings were supplemented with smaller special process team meetings. For example, the QALs and QAPL met about once per month. The frequency of one quality meeting per quarter, where major issues are discussed, supplemented by smaller special process team meetings as needed, appears to be an optimum frequency for the Q Team. We have also initiated a Q Team meeting (approximately every other month) where a team member (other than the QAPL) facilitates the meeting. Topics are determined by the meeting facilitator. The first meeting was held in November and was a chili cook-off, supplemented by a team-building exercise. These meetings are a excellent morale booster.

The first quality meeting of 1994 was held in Las Vegas. DOE management feels it is important for YMP members to see firsthand the Las Vegas operations, and to actually visit Yucca Mountain. Subsequently, almost all members of the Q Team visited the North Portal. These activities greatly contributed to a better understanding of the YMP, and created better relations between various organizations.

The major focus of the Las Vegas meeting was to conduct a self-assessment. The meeting began with a team- building exercise that determined personality types. Most of the Q Team are thinkers or sensors, but two members have a "big picture" personality which helps provide balance. Next, we discussed what type of team we had. It was determined that we are a team leader team, with the QAPL as the leader. We agreed to keep our charter as is and then began the formal assessment.

The Q Team examined the 1993 action item data base to help determine the top accomplishments. The team selected the three most significant items. Brainstorming techniques were then used to identify major problems in the Los Alamos YMP that the Q Team experienced in 1993. These problems were ranked and the top three identified. Lastly, goals for 1994 were identified. Five quantifiable goals were selected. The results are shown in Table III.

During the self-assessment, we also examined our progress with respect to 1993 goals (Bolivar, 1995). All goals were realized by 12/31/94. The self-assessment goals for last year were as follows:

1. Reduce open internal deficiencies to less than 10.
2. Resolve internal conflicts/encourage team building.
3. Decrease our internal records rejection to 5%.
4. Implement the QARD by 7/31/94.
5. Revise all QPs by 7/31.
6. Hold four Q Team meetings in 1994.
7. Identify metrics for the problems we encounter.
8. Hold smaller meetings as necessary.

The Deputy QAPL initiated a series of classes (about one per month) to promote human resource development. The first class covered the facilitation process. Two other classes helped

Table III. Self-Assessment of the 1994 Q Team.

Issue Identification (Top 3 Issues- what we spent most time on)	1. Revising procedures and updating the RTN 2. Interfacing and responding to DOE requests 3. Resolving deficiencies (i.e. CARs)
Major Problems	1. QP revisions took too long 2. Several personality conflicts developed 3. Team effort was not always a focus
Goals for 1994	1. Resolve internal conflicts/encourage team building. This will be measured by doing a survey. 75% of the group perceive this as a problem; we will strive to reduce this to 25%. 2. Establish a vision and mission by 6/30/95. 3. Develop HDR/ self improvement/ strive for excellence. Self-improvement training will be offered. 4. Improve the records system so that a 100% retrievable rate can be achieved. 5. Emphasize QA as employee responsibility. When compared to 1992 and 1993 totals, deficiencies for 1994 should decrease.

the Q Team define core values. Lastly, two classes were devoted to establishing mission/vision statements. Ultimately, nine core values were identified. They are

1. Be loyal to the project and the team.
2. I only commit to things I can deliver.
3. Maintain eye contact- keep focused on the speaker. Approach a common solution.
4. Equal consideration-if two opposing views, weigh them with objectivity.5. Accept each other as we are.
6. It is OK to disagree. There will be an open and risk free environment without retribution.
7. No gossip or hurtful whispers.
8. I only accept options or discussion, I do not accept destructive criticism.
9. Take personal action to alleviate job dissatisfaction.

These values were distributed to team members and can be worn with their badges. We are currently discussing the vision statement (where do we want to be in the future) and mission statement (how do we get there). We will finalize these statements in early 1995. We also updated our team charter (Appendix A).

A goal performance process was started in May. Customers were identified and employees listed one to three goals they wanted to reach in the next three months. Personnel were encouraged to meet with their supervisors and mutually establish the goals. We initially tried to identify how many hours would be required to meet the goal, but we found this to be a needless piece of information and it was discontinued.

The goal process had mixed success. Most personnel were able to identify goals but the "quality" level of goals differed drastically between members. Some people had a difficult time meeting with their supervisor, thus the process evolved to allow consultations with the QAPL or a supervisor. Other people had a difficult time distinguishing between their daily duties and a

supervisor. Other people had a difficult time distinguishing between their daily duties and a specific goal. The process was also very time intensive, consuming 25% to 50% of each quality meeting. However, the purpose for initiating this process was to force personnel to look at what they are doing and to set realistic measurable goals, and this was realized for most people. The QAPL will examine the process in 1995 and try to make it more efficient by establishing guidelines on selecting and measuring goals.

Our Los Alamos program office has established a local computer network. Most of the Q Team can now communicate by e-mail. This has greatly reduced the amount of effort required to exchange current information and documents. The next step will be to establish a direct communication link with the Test Coordination Office in Las Vegas. Presently, communications between these two offices are via a modem or part of an inefficient nationwide computer network. Once we have established direct communication to the Las Vegas Office, we should be better able to satisfy Laboratory protocol and meet administrative needs. This system should become available in mid 1995.

The Laboratory is still experiencing a culture change. Part of this change is an awareness of Continuous Quality Improvement (CQI). The Q Team does discuss and try to implement CQI as a normal way of business. This topic is discussed at almost every quality meeting and drives many of our activities. The attempt to improve is one of the major reasons for implementing a network, making e-mail available to all personnel, and incorporating a new electronic training data base.

Another effort at improvement resulted in the QAPL sending a survey to Q Team members to determine if the quality meeting process could be made more efficient. Six questions concerning meeting length, leadership, and format were distributed. The majority of responses favored the current meeting length (three hours); favored the current leadership by the QAPL; thought the core value meetings were useful but the progress was too slow; and favored the current agenda format where issues are discussed by subject matter. As a result of this survey, several new ideas were implemented. For example, the QAPL agreed to try and hold the quarterly quality meetings during the first two weeks of the quarter. A tentative schedule of quality meetings was made for 1995. The QAPL also selected tentative speakers for each of the meetings the following year. Team members would be encouraged to host monthly meetings, where they could arrange for any agenda. Tim Ickes hosted the first of these meetings in December by holding a Chili Cook-Off. Brad Gundlach won three of four prize categories.

The QAPL believes that successful social interactions of the Q Team members helps to encourage better job performances. To encourage these interactions, snacks or light meals were offered during quality meetings or at the core value meetings. The QAPL also rewarded the support personnel and authors of procedure revisions by treating them to an ice cream social. There was also a new award initiated this year, called the Ron Recognition Award. It was issued to Mike Clevenger in November, for his work on procedure revisions. He received a gold inlaid "Thank Q" stamp. The gift will be rotated among recipients every quarter.

It is difficult to measure how beneficial social interactions, group lunches, and award programs are. However, during the quality assurance management assessment, an independent group of auditors conducted an informal survey of twelve YMP personnel. Their semiquantitative results show that the quality meeting members do enjoy the social interactions, awards, and efforts at defining core values and mission/vision and that these efforts have a positive affect on attitude.

2.1.1 Issues.

Issue 1. A problem arose when DOE decided to decontrol all grading reports since all activities subject to the Quality Assurance Requirements and Description (QARD) will be tracked in the requirements traceability network (RTN). Some of our investigators became worried that former work activities, which were graded out of the quality arena, might be confused as quality efforts, particularly since work breakdown system (WBS) numbers frequently change. Thus, we decided to place our copies of the grading reports under our controlled document system. Once the RTN is approved for Los Alamos, our investigators can use the exemption process in QP-02.12.

Issue 2. The QAPL found that monthly reports are not always sent in on time. Fortunately, this is a minor problem. As a short-term fix, the QAPL decided to notify personnel five days before the reports are due. In 1995, the QAPL will try to develop and implement a better notification system.

Issue 3. There was some "finger pointing" between individuals in early 1994 when a document was distributed incorrectly. In other words, no one would accept responsibility for distributing the document. The immediate issue was settled by identifying people in specific offices who became responsible for different aspects of the job. The long-term solution was to provide cross training. The core values classes helped identify and resolve this problem.

Issue 4. There were some questions by Q Team members as to what type of travel was allowed. Subsequently, the QAPL defined discretionary travel, established travel guidelines, and distributed the information to members of the Q Team. In general, travel to professional meetings is limited to one per year. There is no limit to the number of meetings an individual may attend, provided a paper is given. Travel to any meeting is allowed only if critical job duties are taken care of. The QAPL agreed to periodically provide a list of meetings of interest to the Q Team.

Issue 5. The TCO was involved in a dispute with DOE quality assurance personnel. The issue had to do with review of design and test related information (D&TRI). DOE wanted Los Alamos to use the Project Office procedure AP-5.19 for the review process, whereas our personnel want to use internal procedure QP-03.25. When our Project Office Liaison researched the problem, he found that the issue was much more involved than initially envisioned. The entire design process (which involves several Project Office procedures) had been studied by a DOE team. A more efficient way of doing business was identified. Unfortunately, bureaucratic delays and petty arguments appeared to have destroyed the possibility of implementing the new process. The liaison was able to identify a weakness in the existing system (which was fixed) and also was able to amicably resolve most differences. Unfortunately, until participants and DOE both start working together to solve problems, these minor issues will continue to escalate and use tremendous resources.

Issue 6. Another issue between our TCO personnel and DOE quality assurance had to do with study plans, and whether these plans are truly plans , i.e. they are the best estimation at the time the document was written (the TCO position), or are the plans an implementation document that has to be followed exactly (the DOE position). The initial discussion had to do with procedures, which the Nuclear Regulatory Commission (NRC) initially required to be listed in study plans, but are no longer required. Should investigators be held to the strictest interpretations of the plan, and if so, do they need to revise study plans to make sure they are current? Based on NRC input, the plans are to be considered as requirement documents and are to be followed.

Issue 7. During the extent of 1994, developments were initiated to support new technical work in P-tunnel, to be jointly worked upon by Lawrence Berkeley Laboratory (LBL) and Los Alamos personnel. A question arose as to whose quality assurance plan was to be followed. Since LBL

works with several participants, it usually follows the appropriate set of procedures. However, since LBL will become a major participant, the DOE Quality Assurance Division Director decided that LBL will develop and then follow its own quality assurance program. Until then, existing participant procedures will be followed.

Issue 8. Ron Oliver, a member of the TCO visited a quality meeting in the fall. Ron provided a very astute observation of Q Team activities and documents. He requested that we stop speaking in acronyms and that procedures be identified by their titles, not just their numbers. His ideas were incorporated.

2.1.2 Goals for 1994.

- Develop an electronic network that Q Team members can communicate on.
- Produce a relational data base for distribution lists.
- QALs to visit subcontractors at least once per quarter.

An office electronic network (termed a LAN) was established and connections established with contractor and outlying sites. Everyone on the Q Team, except for those in Las Vegas, can now communicate electronically. The office in Las Vegas still needs to be linked, and is waiting on wiring by a contractor. A relational data base for distribution lists has been deferred to 1995, when contractor support should be in place. The QALs did visit subcontractors at least twice during the year. In retrospect, a visit of four times per year was not realistic. In summary, one goal was achieved, one goal was deferred to 1995, and one goal was not obtained.

2.1.3 Goals for 1995.

- Establish an e-mail or electronic link with the QAL in Las Vegas.
- Develop a better notification system for monthly reports.
- Complete the vision/mission statement for the Q Team.
- Form a QA management advisory team.
- Produce a relational data base for distribution lists.
- Hold four quality meetings, one of which is in Las Vegas.

2.2 Procedure Revisions. The Los Alamos quality program uses two types of implementation procedures: quality administrative procedures (QPs) and detailed technical procedures (DPs). Preparation follows formal guidelines as described in QPs-06.2 and -06.3. In addition, QPs are edited and formatted by the EES-13 office.

In January 1994, Los Alamos reissued all QPs. These revisions were in response to the new Quality Assurance Requirements and Description (QARD). This document contains the quality requirements for the YMP. The Los Alamos quality program at the beginning of 1993 had a sixty page quality assurance program plan, thirty-seven QPs, a six hour orientation class, a separate software quality assurance plan and six corresponding procedures, a quality assurance program plan, a formal auditors class, and eighty-two DPs. When the revised procedures were issued in January 1994, the quality assurance program plan had been replaced by a requirements traceability network (RTN) matrix, the six hour orientation class was reduced to four hours in length, the software quality assurance plan was deleted and the six software procedures reduced to four. The software program became an integral part of the overall quality program and software procedures combined with programmatic procedures made a total of thirty QPs. There remained approximately 90 DPs. The formal audit class also remained and we instituted a new records management class (two hours in length). These revised procedures generally did not introduce new requirements, but rather better defined existing processes. Much

of the Q Team's and quality assurance staff's time in 1994 was devoted to procedure revision activities.

These revised procedures were submitted to DOE for project review. This resulted in one hundred and thirty comments. This in turn resulted in twenty-nine procedure revisions (some procedures were revised twice before DOE approval was obtained). The Q Team and QAPL had hoped to avoid inundating investigators with a plethora of revisions that would require constant retraining. Unfortunately, almost every procedure required changes, and some went through the revision process twice. Fortunately, most changes were minor in nature. Only three procedures (i.e., those for procurement, M&TE, and data submittals) required major revisions. Table IV shows the status of procedure revisions for the last four years. Table V shows statistics for QPs. Procedure revisions and updates to the RTN required a significant portion of the Q Team activities in 1994. Most RTN comments were satisfied by October, although it wasn't until December 21 that the last issue was resolved and DOE issued a letter of approval. It was difficult to measure the exact amount of time required to complete a revision because several procedures were "held" until the DOE approval letter was sent. The DOE/Los Alamos discussions concerning comment resolution also were time consuming and were included as part of the revision time.

2.2.1 Issues.

Issue 1. The QAPL and Q Team had hoped to avoid having to subject investigators to constant retraining to procedures. That was why all procedures were released in a block in January. However, as a result of the DOE review of our RTN matrix, most QPs required at least a minor revision, thus our efforts to avoid repetitive training were unsuccessful.

Issue 2. It took several months of revisions and discussions before DOE accepted our procurement procedure. We eventually agreed to institute a technical review by someone other than the group leader. We felt this review could be accomplished when a group leader signed off on the purchase request. However, since several group members could sign the purchase request, we felt we had minimal control and thus we abandoned this argument. The DOE eventually accepted our procurement process (where we check the final product against the original request) and granted us an exemption to the more stringent procurement requirements in the QARD.

Issue 3. We decided to completely rewrite the M&TE and data submittal procedures. Both processes were poorly understood and had undergone a change of personnel. Although these two procedures offered no unusual problems, the process of obtaining a draft procedure for review was very time consuming. Much of this delay was caused by new personnel in both systems. Not only did the authors have to learn the appropriate process, they also had to become familiar with the YMP.

Issue 4. It still takes a relatively long time to do a major revision of a procedure (Table V). Many delays were caused by the DOE comment resolution process and by conflicting priorities. We know we can do a minor revision in twenty-four hours (Bolivar, 1995) but major revisions still can take several months unless someone is entirely devoted to the task. We were unable to reduce this time in 1994.

Table IV. Procedure Revision Status.

1991	Total	Affected	New	Deleted	Revised
QPs	38	25	11	4	10
DPs	96	23	4	2	17

1992	Total	Affected	New	Deleted	Revised
QPs	36	27	7	7	13
DPs	94	47	16	18	13

1993	Total	Affected	New	Deleted	Revised
QPs	37	47	10	8	29
DPs	95	12	3	2	7

1994	Total	Affected	New	Deleted	Revised
QPs	30	28	0	0	28
DPs	96	20	5	4	11

Table V. Statistics for Revision of Procedures.

Year	Types of Revision	Time (major/minor)	Percent (of total) Revised
1989	4 major/ 0 minor	18 mo.	10%
1990	5 major/ 4 minor	18 mo. / 11 mo.	22%
1991	13 major/ 4 minor	12 mo. / 6 mo.	42%
1992	16 major/ 5 minor	5 mo. / 2 mo.	53%
1993	23 major/ 15 minor	8.7 mo. / 4.5 mo.	100%
1994	3 major/ 26 minor	8.0 mo. / 1.9 mo.	77%

Issue 5. The QAPL decided to give up ownership of most QPs. Ownership was assumed in 1991 when the quality assurance program was in disarray. However, the program is now functioning smoothly. Ownership will now be by the respective author.

Issue 6. One of the long-term goals of the Q Team is to eventually go to an electronic system for the majority of work processes. Ideally, electronic versions of procedures and their forms would

be available on the EES-13 network server. As part of this philosophy, all forms must be compiled under one software package. We decided to compile forms in FoxPro. All text is done in Word Perfect. The eventual process will be to generate all forms and text under one software package; transfer procedure revisions to the network (server); and connect QALs to the network. Eventually, electronic signatures may be used. Several parts of this process are now under development.

Issue 7. There has been some minor confusion as to what constitutes a quality assurance review of a notebook. The requirements aren't clear, they simply require that a review be done. A special process team of mostly QALs examined this issue. It was determined that notebooks need to meet two main criteria. The first is they must be legible; this normally isn't a problem. The second is that the requirements of the notebook procedure, QP-03.5 must be met. One of the QALs volunteered to compile a checklist for a quality assurance review of a notebook.

Issue 8. The most difficult DOE comments to resolve on our revised procedures had to do with procurement. Procurement for Los Alamos YMP is actually done through another Laboratory group and it is very difficult to impose YMP requirements on this organization. Consequently, after several discussions and meetings, we were able to obtain an exemption to selected procurement requirements. Because vendors are surveyed before work is begun, no quality is compromised. We also agreed to conduct a technical review of purchase agreements. This provides no added value, for our position is that the originator is most qualified to conduct this review. However, in the spirit of cooperation, we consented.

Issue 9. In an effort to examine how efficient the records system is, we conducted an internal performance-based audit of one of our groups. The auditors took a recent publication and attempted to work back through the system. It was found that old records could not be tracked very well. Poor ties between M&TE and the notebooks were found. However, if one starts with a notebook, all data is much easier to track and tie together. Rules that were in place at the time the work was done were not adequate for the needs of today, and the DOE record retrieval system, does not work to full expectations. We examined our existing procedures to ensure that records submitted today provide the necessary information needed for timely retrievals. It is the old data (pre- 1992) that will be difficult to trace.

2.2.2 Goals for 1994.

- Look at the QP revision process and determine if it can be made more efficient.
- Revise selected QPs to satisfy any DOE review comments.
- Withdraw the quality assurance program plan.

We were able to reduce the time for minor revisions (Table V) but major revisions can still take several months. Part of this delay was caused by the DOE comment resolution process and in part by conflicting priorities of authors. However, all changes to the RTN matrix and the appropriate QPs were completed on December 21, 1994. The quality assurance program plan was withdrawn. Approximately 85% of the goals were realized.

2.2.3 Goals for 1995.

- Determine if the QP revision process can be more efficient, especially for major revisions.
- Revise selected QPs to meet expected changes in the QARD (QARD will be revised in 1995).
- Revise selected QPs to reflect the transfer of the audit process to DOE.
- Compile a quality assurance checklist of the notebook procedure.

2.3 Measuring and Test Equipment (M&TE). These activities are administratively handled by an M&TE Coordinator. The M&TE Coordinator notifies individuals when calibrations are due.

2.3.1 Issues.

Issue 1. The M&TE Coordinator examined procurement records to determine if there were pieces of equipment not on the M&TE list. In general, this wasn't a problem. However, during a routine examination of M&TE records it became obvious that some documentation wasn't in the M&TE files. This resulted from "different rules at different times". We are now updating these files.

Issue 2. The initial M&TE data base was developed with a program that doesn't provide Windows support. Therefore we decided to create a new data base using FoxPro, which is our group standard. The initial effort was completed in October.

2.3.2 Goal for 1994.

- Revise the M&TE procedure (QP-12.1).

This goal was accomplished for a 100% completion rate; however, the process can still be streamlined further.

2.3.3 Goals for 1995.

- Make the bureaucracy of M&TE more efficient (ensure that investigators are notified, etc.).
- Refine the electronic data base for M&TE.

2.4 Training. The Los Alamos quality program philosophy is that training is only required when someone does work governed by the QARD. We have invoked both a paper process (which satisfies the quality assurance documentation aspect) and an electronic tracking process (which reduces the administrative bureaucracy). The Orientation class was updated and provided to YMP personnel in January (LATA, 1994a,b). Over 95% of all comments for the last three years have been positive, although there have been suggestions to shorten the class. The majority of training to our quality administrative procedures is by "read only". There is no noticeable correlation between records rejected (discussed under Section 2.6), deficiencies (see Trend Analysis, Section 3.0), and number of classes taught (Table VI). The majority of training to our detailed technical procedures is by formal or on-the-job training. Classroom attendance is shown in Table VI. A list of classes is included as Appendix B.

Table VI. Training Classes.

Year	Classes Held	Attendees
1991	52	247
1992	16	125
1993	3	41
1994	10	87

2.4.1 Issues.

Issue 1. As the result of an inquiry it was determined that our Training Coordinator was not tracking training to all Project Office procedures. The process was examined and these procedures are now entered into the electronic data base whenever a controlled procedure is released. The data base then automatically tracks the training.

Issue 2. The records management class was offered seven times from January to July. The purpose of the class was to notify YMP personnel of the most common errors in record packages and how to avoid making these errors. Over 90% of Los Alamos staff received this training. Because we did not intend to make this a mandatory training class indefinitely, we deleted the training requirement when the records procedure, QP-17.6, was revised. The class will now be offered as needed.

Issue 3. The electronic training data base has been developed and is now routinely used. However, much of 1994 was spent in resolving minor, but highly annoying, problems. There were several personality conflicts, and in general, a refusal to take ownership of the problem. There were several meetings to address these problems and we eventually resolved most of them. We have also provided additional computer training and assigned additional personnel to solve hardware problems and are working on an instructor's manual. The root cause was the failure of the QAPL to realize the extent of changes the new process would require, to specifically assign responsibilities, and to provide necessary training for affected personnel. This exercise did provide a good learning experience for trying to replace a paper-intensive process with an electronic one and should help prevent similar situations from occurring in the future. The small problems that still occur are handled on an as- needed basis and are no longer a major distraction. The initial work was reported in Environmental Safety Services (1994a,b). This was updated by LATA (1994c).

Issue 4. We had tremendous difficulties in developing the records training class. Some of the problem was the result of personality clashes, and some was the result of unforeseen complications (e.g., DOE procedures were revised causing us to revise our procedures, and in turn, update the class). However, the major delay was poor communication between the various entities involved. When we instituted a tight schedule and communicated frequently, the problems were resolved.

Issue 5. We continue to have poor communications between the training department and the group office where the organizational chart is maintained. Personnel may be routinely entered into the training data base or onto the organizational chart, but not always both. We instituted a process whereby all new personnel are identified at the quality meetings and both data bases can be updated simultaneously.

Issue 6. We have also had inconsistencies with an administrative task identifying people leaving the YMP. We decided that if someone leaves the YMP, an informal note is sent to the Training Coordinator. She will notify the Document Control Coordinator (for Quality Concerns closure). The note is placed in the personnel file but does not become part of the records package unless it is an official memo.

Issue 7. Procedure QP-02.5, Selection of Personnel, was revised. During this process, the Limited Function process was modified to better meet QARD requirements. These forms are normally used for graduate research assistants (GRAs), or summer students, or people with a limited work scope (such as a professor who will do a technical review only). The revision resulted in instituting a qualification evaluation section, similar to the one used for other employees. The major benefit of the limited function process now is that the YMP orientation class can be optional.

Issue 8. Procedure QP-02.11, Personnel Orientation, didn't clarify if supervisor orientation is needed for a limited function person. After several discussions, it was decided that it is a good business practice to conduct supervisor orientation for all limited function personnel, even if they are not governed by the requirements of the QARD. This process was simplified by adding the information that a supervisor conveys to a new employee in Attachment 2 of QP-02.11.

Issue 9. In the past, some position descriptions were written for a person rather than for a position. If a position description is written to describe the scope of work (rather than to describe the qualifications of some individual), then the position description does not have to be rewritten when personnel change. We have instructed QALs to assist investigators in using this philosophy.

Issue 10. The Orientation class was revised but the process was time consuming and it was difficult to complete a "final" edit because of last minute changes. Part of the problem can be attributed to conflicting schedules, part to changing requirements and procedures, and part to poor communication. The QAPL will better define a work schedule for the update in 1995.

Issue 11. A minor controversy arose as to what kind of documentation would be needed to show that personnel qualifications had been verified. This issue was discussed with DOE and agreement was reached that a signature attesting to the fact that personnel qualifications were verified is adequate documentation for the requirement as set forth in the QARD.

Issue 12. Several investigators have several coexisting position descriptions open simultaneously. This does not create a problem and may be encouraged to allow investigators to change jobs with minimal paperwork, yet still satisfy quality assurance requirements.

2.4.2 Goals for 1994.

- Test the training data base and fix all problems.
- Complete the 17.6 class and offer it to all YMP personnel.
- Ensure that the orientation class reflects any changes in procedures or requirements.
- Decide what, if any, training is needed for 1995.

The electronic training data is up and working. Although there are still minor problems, a process was established to fix these and the data base is now routinely used. The records management class was provided to all YMP personnel. The orientation class was updated and offered in January. It was determined that a "refresher" type of orientation class might be helpful in reducing record package rejections and position description discrepancies. There are limited resources available to develop such a class.

2.4.3 Goals for 1995.

- Continue to refine the training data base and fix problems in a timely manner.
- Offer the records management class (QP-17.6) in 1995 as needed.
- Ensure that the orientation class reflects changes in procedures or requirements, and update the class in a timely manner.
- Continue to examine the feasibility for a "refresher" type of orientation class.

2.5 Software. Requests to accept or modify software packages are submitted via a software change request form. These are evaluated by a Configuration Control Board (CCB), and after selected documents are produced and reviews conducted, a software package can be accepted.

The Software Management Coordinator, Christ Mechels, retired in May and was replaced in July by Bradley Gundlach. Bruce Robinson remained as software CCB chairman. The revision of the QARD resulted in our only having to qualify scientific and engineering software (SES). This reduced the number of codes we had to track and control with configuration management from 181 to only 4 (Table VII). Consequently, we were able to phase out a technician assistant position in February. In 1994, two CCB meetings were held.

Table VII. Status of Software Change Requests.

Year	Codes Affected
1991-1993	181 Submitted; 128 Approved
1994	4 Affected

2.5.1 Issues.

Prior to 1994, the software program consisted of six QPs with a software quality assurance plan, and an extensive eight hour video training. The new QARD requirements required that we revise all these documents. Because the new QARD greatly reduced the types of software that have to be controlled, it was decided that the software quality assurance plan (formerly an implementation document) could be incorporated into the six software QPs, and thus eliminated. In turn, these QPs could be reduced to four QPs. We would then supplement the four QPs with a software quality assurance guidebook, which would not contain any requirements, only guidance. These documents have been revised and were issued in January. Training for these documents is "read only".

The future direction of our software program is uncertain. It will depend on what DOE and the NRC require from us. Although the most recent QARD resulted in a lessening of former software requirements, some feel that the requirements may change again, becoming more strict. Change seems imminent based on the recognition of DOE orders and the fact that only SES is addressed currently in the QARD. Thus our QP revisions tried to maintain a capability to allow for a stricter program should the need arise. However, the current Software Management Coordinator is examining more efficient ways to conduct software engineering and configuration control. He also feels that our existing QPs also need to be revised to better reflect how we do work and to make the process more efficient.

2.5.2 Goals for 1994.

- Examine the new process and ensure that it functions adequately.
- Determine if formal training is needed for the software QPs.
- Determine if better software engineering and configuration control methodology could be used.
- Set up a local area network.

The former software management process was revised to meet the new QARD requirements. The process satisfies the existing regulations, however, it can be made more efficient. The training needs were evaluated and found to be ineffective. The eight hour video was replaced by "read only" training. The new Software Management Coordinator is in the process of evaluating existing software engineering and configuration control methodology. We presently are consolidating activities on three computers and are in the process of installing a program that will allow more efficient configuration control. A group network has been established and we are in the process of connecting to outlying sites. All goals were realized, although several activities are ongoing.

2.5.3 Goals for 1995.

- Examine the new procedures and ensure they function adequately.
- Determine if formal training is needed for the software QPs.
- Determine if better software engineering and configuration control methodology could be used.
- Set up a local area network.

2.6 Records.

In 1992, 971 records were received by the Records Processing Center (RPC; Table VIII). Of these, 117 (12%) were rejected internally. After the noted problems were resolved, they were submitted to the Central Records Center in Nevada. Of the 971 submitted, 36 were rejected (3.7%). In 1993, 816 records were submitted. The RPC rejection rate remained about the same but the DOE rejection rate was reduced to 0.5%. In 1994, 800 records were submitted with an internal rejection rate of 15%, and a DOE rejection rate of only 0.0013%. This is an excellent acceptance level. The Q Team feels that a proper records management class could help reduce the internal rejection rate. This issue will be discussed at length in 1995.

Although the number of total records submitted decreases each year, the amount of pages submitted increases. We also have seen an increase in the activity of records handled by the TCO in Las Vegas. Packages can obtain volumes of several hundred pages each.

We also have started to track the reference transmittals submitted to the central records center in Las Vegas. These references are submitted to obtain accession numbers, which DOE uses to track references. In 1994, 628 references were transmitted. Our RPC rejected 8.12% (51). The central records center in Las Vegas rejected 2.2% (14).

2.6.1 Issues.

Issue 1. The internal rejection rates for 1992 and 1993 are similar, but increased for 1994. Because of this, and because the Q Team feels these rejection rates are too high, a records management formal training class was offered in 1994. It is too early to tell if this class will help reduce the number of internal rejections. Although the internal rejection of records is a problem, only about 0.0013% of the records sent to the Project Office are rejected. This rejection rate is one of the lowest in the YMP.

The reasons for internal rejected records are complex and vary from group to group. Issues such as lack of training, changing terminology, inconsistent application of regulations, lack of attention to detail, a complicated records management plan that is not a requirement document in the eyes of quality assurance but is in the eyes of DOE records personnel, and some requirements that are either not understood or not implemented by some investigators (such as requiring black ink on all quality documents), all contribute to the problem.

Many investigators are not adequately trained in records terminology, or they expect other personnel (such as resident file custodians) to perform a review of records before they are submitted. The final responsibility for a record rests with the originator, and this concept is not fully understood or practiced by all investigators. Thus, we committed to "hands on" mandatory training class. The foundation for this class was developed early in 1992 but was put on hold when the Records Coordinator left the Project and budget restrictions limited our training development. The class was initially developed in 1993, but revised extensively in 1994 as the result of two pilot classes and revisions to the DOE procedures that govern records activities. The class was offered five times in 1994. Because we wanted YMP personnel to become more familiar with changing records requirements, it was decided that the class be offered for six months, and once the majority of personnel had trained to it, the class would be then offered once or twice a year. The initial training was completed in July.

Issue 2. Each year records budgets decrease and we are able to provide only the barest of necessities. Because of this we have several boxes of "old" records that should be evaluated and either entered into the system or thrown away. Many of these documents are probably already in the records system. But because systems have changed over the years, and because Los Alamos personnel are not yet proficient at using the current YMP records retrieval process, we hesitate to throw these documents away until we verify that the records have been captured. Unfortunately, space is becoming a problem. The DOE has instituted a new system, called the IRIS, and hopefully this system, when it is fully implemented, will provide a solution to some of these problems.

Issue 3. There was significant confusion to many records submitters about the use of a primary identifier. After extensive discussions in Q Team meetings, we decided to keep the identifier, and revise QP-17.6, records management, to better explain the process. The primary identifier will also be discussed in greater detail in the 17.6 formal class.

Table VIII. Records Statistics for 1992 (top), 1993 (middle), and 1994 (bottom).

Group	Records Submitted (with % of total)	RPC Rejected	YMP Rejected
EES-13	628 (64.7%)	69	21
EES-13-LV	214 (22%)	8	3
EES-1	54 (5.6%)	21	6
EES-4	1 (.0001%)	1	0
EES-5	3 (0.3%)	1	2
EES-15	4 (4.1%)	1	0
INC	56 (5.8%)	14	4
LS-2	1 (.001%)	1	0
LBL	10 (1.0%)	1	0
Total	971	117 (12%)	36 (3.7%)

Group	Records Submitted (with % of total)	RPC Rejected	YMP Rejected
EES-13	451 (56.2%)	32	0
EES-13-LV	167 (20.5%)	1	1
EES-1	68 (8%)	27	2
EES-4	6 (0.8%)	0	0
EES-5	2 (2%)	0	0
EES-15	10 (1%)	8	0
INC	80 (10%)	29	1
LS-2	01 (0.1%)	0	0
LBL	31 (0.4%)	4	0
Total	816	101 (12%)	4 (0.5%)

Table VIII (Continued). Records Statistics for 1992 (top), 1993 (middle), and 1994 (bottom).

Group	Records Submitted (with % of total)	RPC Rejected	YMP Rejected
EES-13	348 (43%)	31	0
EES-13-LV	175 (22%)	1	0
EES-1	39 (5%)	22	0
EES-4	3 (0.4%)	3	0
EES-5	0 (0%)	0	0
EES-15	0 (0%)	0	0
CST	197 (25%)	33	1
LS-2	5 (0.6%)	2	0
LBL	33 (4%)	31	0
Total	800	123 (15%)	1 (0.0013%)

Issue 4. When the resident file custodian for the EES-13 group office left the project, the need for the position was examined. It was found that other personnel could easily assume these duties, with some assistance from a QAL. Consequently, this position was not filled. Over the course of 1994, the Q Team and QALs tried to impress upon investigators that the responsibility for records submittals rested with the originator, not with a secretary or resident file custodian. As a result, the position of resident file custodian eventually disappeared by the end of the year.

Issue 5. In an effort for continuous improvement, J. Day will assist A. Pratt with ACPL reviews of procedures. A. Burningham was authorized to do quality assurance submittal authority for field process requests. The issue of signature authority and what it means was discussed at length. In the future, signature authority should be referred to as "delegation of authority". The signature represents an approval. A position description is not needed, but the signer does need the appropriate training.

Issue 6. Due to a heavy work load, it is becoming increasingly difficult for TCO personnel to attend quality meetings in Los Alamos. To allow for planning, a tentative quality meeting schedule for 1995 was provided. The QAPL also agreed to hold at least one quality meeting in Las Vegas.

2.6.2 Goals for 1994.

- Do an in-depth study of the records process.
- Encourage more interactions with the Project Office Liaison and DOE on records issues.
- Conduct the new 17.6 class.
- Examine index and tracking system and improve as appropriate.

The records process was studied as time allowed. In general the process functioned for records submitted within the last couple of years. However, it can be very difficult to retrieve older

records. Part of the problem is that the records weren't indexed correctly, or not consistently. We have found several instances where the subject line for a records package wasn't entered verbatim from the transmittal form, and these records cannot be retrieved easily. We have thus actively engaged our Project Liaison to discuss these problems with DOE and try to find an amenable solution. The records management class (QP-17.6) was held. We met about 90% of our goals.

2.6.3 Goals for 1995.

- Continue to study the records process and implement more efficiency.
- Have the Project Office Liaison be more proactive on record issues.
- Offer the records management class (QP-17.6) at least once.

2.7 Controlled Documents. The majority of controlled documents issued in 1994 were QPs and DPs (Appendix C). Most implementing procedures contain pages marked with the red "controlled" stamp.

2.7.1 Issues.

Issue 1. The controlled document system works smoothly and there were not many associated issues. We are examining methods to automate this system. In this context we developed better indexing software.

Issue 2. During the issuance of procedures, it was discovered that the "logo" caused smearing on some pages. It was decided that we would not change logos, rather we'd find a machine that would copy better. Although it took several weeks to resolve this problem, a suitable copy machine was found.

2.7.2 Goal for 1994.

- Determine if the training and controlled document data bases can be electronically linked.

We determined that we did not want to link these two data bases until the training program had been utilized for a much longer time. The one goal was realized.

2.7.3 Goal for 1995.

- Determine if further improvements can be implemented.

2.8 Travel, Presentations, and Publications. Quality organization representatives attend Project Office meetings, workshops, and training classes and provide presentations as required. For example, the QAPL and Verification Coordinator attend DOE quarterly quality assurance committee meetings. These meetings provide a forum to discuss quality issues and are an excellent arena to review proposed changes to a quality program.

Meetings attended are listed in Table IX; training classes attended and presentations made are listed in Tables X and XI, respectively. Publications are found in References, Section 5.0. These include two conference articles (Bolivar et al., 1994; and Day et al., 1994), a management assessment report (Reese, 1994), and the last three status reports (Bolivar, 1992; 1994; 1995).

2.8.1 Goal for 1994.

- The goal for 1994 is to publish one professional paper on some aspect of the quality program.

This goal was 100% completed.

2.8.2 Goals for 1995.

- Publish one professional paper on some aspect of the quality program.
- Complete the 1995 status report in a timely manner.

Table IX. Meetings Attended in 1994.

Meetings	Attendees	Month
Records Management Council		
Washington, DC	J. Day	Jan. 18-21
Las Vegas, NV	J. Day	April 1
Las Vegas, NV	S. Martinez	April 19-21
Albuquerque, NM	S. Martinez	July 19-20
Las Vegas, NV	S. Martinez	Dec. 14-15
Software Advisory Group		
Las Vegas, NV	C. Mechels	Feb. 1-2
Las Vegas, NV	B. Gundlach	Nov. 8-9
Training Representatives Meeting		
Las Vegas, NV	C. Chavez, S. Martinez	Feb. 1-2
YMP Technical Review		
Las Vegas, NV	S. Bolivar	Feb. 14-17
Q Team and visit to ESF		
Las Vegas, NV	Q Team	March 8-9
Martin Marietta Quality Program		
Denver, CO	C. Mechels	March 22
Technical Data Management		
Las Vegas, NV	J. Day, J. Walterscheid	March 22
Denver, CO	J. Walterscheid, S. Bolivar	July 13-15
Albuquerque, NM	M. Herrera, S. Bolivar	Oct. 18-19
Quality NM		April 4-6
Carlsbad, NM	S. Bolivar	
STC (software management)		April 10-15
Salt Lake City, UT	C. Mechels	
SPIN (software management)		April 8
Albuquerque, NM	C. Mechels	
Discussions with DOE on RTN, QA		
Las Vegas, NV	S. Bolivar, J. Day	May 12
Las Vegas, NV	S. Bolivar	June 28
Las Vegas, NV	S. Bolivar	August 29
Las Vegas, NV	S. Bolivar	Nov. 8-9
Las Vegas, NV	S. Bolivar	Dec. 7 & 9
48th Annual Q Congress		
Las Vegas, NV	P. Gillespie, J. Day, S. Bolivar	May 24-26
IHLRWM (waste conference)		
Las Vegas, NV	T. Ickes, S. Bolivar	May 21-26
LBL and SU (contractor visits)		
Berkeley, CA	R. Shay, L. Wichman	August 1
Berkeley, CA	R. Shay, S. Bolivar	Sept. 1-2
Berkeley, CA	R. Shay	Nov. 22-23
21st Energy & Environment (conference)	S. Bolivar, J. Day, P. Gillespie, J. Young	Sept. 20-22
Tucson, AZ		
Spent Nuclear Fuel QA		
Salt Lake City, UT	S. Bolivar	Sept. 26-27
Project QA Committee		
Las Vegas, NV	S. Bolivar, J. Day	Sept. 29-30
Transition Plan		
Las Vegas, NV	S. Bolivar, M. Clevenger	Nov. 8-9

Table X. Training in 1994.

Training	Attendees	Date
Requirements Traceability Network Training, Las Vegas, NV	S. Bolivar, P. Gillespie	March 22-23
YMP Orientation Los Alamos, NM	20 YMP personnel	Jan. 19
Records Management (QP-17.6) Los Alamos, NM Las Vegas, NV (March 10 only)	Approximately 20 YMP personnel per class	Jan. 26, Mar 10 (pilots) April 19, 25 May 17; July 28
Performance Based Training Las Vegas, NV	S. Martinez C. Robinson	Feb. 1-2
Mixed Waste Management Video Conference, Albuquerque, NM	S. Bolivar	6 classes Jan. - March
Malcolm Baldrige National Quality Training Los Alamos, NM & Albuquerque, NM	S. Bolivar	April 12-15 Dec. 12-14
IRIS Database Demo Las Vegas, NV	S. Martinez	April 19-21
Tutorial on Why Employees Leave & Professionally Speaking, Las Vegas, NV	S. Bolivar	May
Basic Tools of Quality Control (40 h) Los Alamos, NM	S. Bolivar	June
Risk Assessment of Radiological Hazards UNLV, Las Vegas, NV	A. Burningham	June, July
Computer Training Albuquerque, NM	S. Martinez, C. Chavez	April 29
Licensing Process & Documenting Your Work Workshop Los Alamos, NM	About 30 YMP personnel attended.	August
Customer Astonishment Workshop Phoenix, AZ	M. Clevenger, S. Bolivar	Sept. 21
OCRWM Audit Team Leader Class Las Vegas, NV	L. Wichman	Sept. 17-21
Benchmarking Techniques Los Alamos, NM	S. Bolivar	Nov. 14-15
Windows (computer training) NNM Community College	S. Martinez	May, June

Table XI. Presentations.

Presentations	Presenter	Date
Changes in the Quality Program, to All Hands Meeting TCO, in Los Alamos, NM	S. Bolivar	01/27/94
The Los Alamos QA Program, to DOE Audit Team, in Los Alamos, NM	S. Bolivar	08/15/94
Presentation of The Quality Council in the Scientific Arena, to 48th Quality Conference, in Las Vegas, NV	J. Day	05/26/94
Orientation for QA Program, to attendees, in Los Alamos, NM	S. Bolivar	01/26/94
Presentation of The Transition to a Revised Quality Assurance Standard: The Los Alamos Experience, to 21st Nat. Energy & Environmental Quality Division Conference, Tucson, AZ	S. Bolivar	09/20/94
Status of the QA Program, Presentation to All Hands Meeting	S. Bolivar	10/11/94

2.9 Verification Activities. Jim Young became Verification Coordinator in February. Lyle Wichman became Corrective Action Report Coordinator in December. In 1994, seventeen internal audits and sixteen internal surveys were conducted (Tables XII and XIII). Subsequently, nineteen deficiencies were issued (Table XIV). This is the second year that the number of issued deficiencies was less than twenty. It is easier to maintain a more efficient quality program by keeping the number of issued deficiencies relatively small. Since each deficiency takes at least two man weeks to resolve, there can be significant savings in manpower with a lower issuance rate.

Los Alamos YMP internal audits and survey schedules are coordinated by the Verification Coordinator. In addition to a team of professional auditors, QALs and technical personnel may be used as technical auditors. The Los Alamos YMP currently has five certified lead auditors.

Minor modifications were made to the procedures for audits, surveys, and certification of lead auditors. Late in 1994, DOE notified us to transfer the audit activities from Los Alamos to DOE in FY95. This will have a major impact on our verification process and the way we ensure the program quality requirements are met.

Table XII shows the 1994 Los Alamos internal audit schedule. Most groups, including subcontractors, showed improvements in attitude and awareness of quality issues. Sixteen surveys were conducted to address specific issues of concern, to verify RTN matrix input, or to qualify vendors (Table XIII). Contractors were audited at about the same time as the respective principal investigator. This provided a good vertical slice of activities being conducted and proved to be a very effective method of auditing.

A management assessment was conducted (Reese, 1994). There were no significant issues or deficiencies identified.

2.9.1 Issues.

Issue 1. Subcontractors sometimes feel they are not an important part of the Los Alamos YMP. This perception is primarily the result of being physically distant from Los Alamos and not being involved in Los Alamos YMP daily activities. To foster better interactions, the QAPL attends selected subcontractor preaudit meetings and provided presentations on the status of the Los Alamos YMP quality program and on how to be audited. To further enhance communications, the QALs visit subcontractors at least twice a year.

Table XII. Internal Audit Schedule.

Audit Number	Date	Group
LA-AR-EES-1/YU-94-01	5/12-13	ESS-1 (Yale University)
LA-AR-EES-13/TCO-94-02	5/23-26	EES-13/LV (TCO)
LA-AR-EES-1/PSU-94-03	8/30-31	EES-1 (Penn State University)
LA-AR-EES-1-94-04	6/22-28; 7/25-27	EES-1
LA-AR-CST/SU-94-05	8/29-30	CST (Stanford University)
LA-AR-CST/LBL-94-06	9/1-2	CST (Lawrence Berkeley Laboratory)
LA-AR-EES-13-94-07	10/3-7	EES-13
LA-AR-EES-13/VOL-94-08	10/6-7	EES-13 (LA Volcanism)
LA-AR-EES-13/LV/UNM 94-09	10/11-14	EES-13/LV (University of New Mexico, Volcanism)
LA-AR-EES-13/LV/UC-94-10	10/17	EES-13/LV (UC-Riverside)
LA-AR-EES-13/LV-94-11	10/18-20	EES-13/LV (Volcanism)
LA-AR-LS-2-94-12	12/07	LS-2
LA-AR-CST/HG-94-13	11/1-4	CST (HydroGeoChem)
LA-AR-CST-94-14	11/14-28	CST
LA-AR-EES-5-94-15	12/13-22	EES-5
LA-AR-EES-4-94-16	12/14-15	EES-4
LA-AR-EES-15-94-17	12/9	EES-15

Table XIII. Internal Survey Schedule.

Survey Number	Date of Survey	Group, Reason for Survey
LA-SR-EES-13/LV-TCO-94-01	3/7-11	EES-13/LV, TCO (record packages)
LA-SR-EES-13/LV-94-02	3/6-9	EES-13/LV, TCO (RTN)
LA-SR-EES-13/LV-94-03	3/6-9	EES-13/LV (RTN)
LA-SR-EES-1-94-04	3/28-31	EES-1 (RTN)
LA-SR-SIMCO-94-05	1/28	SIMCO (supplier)
LA-SR-CST-94-06	4/11-18	CST (RTN)
LA-SR-EES-13-94-07	4/5-11	EES-13 (qualifications)
LA-SR-EES-13-94-08	4/25-5/6	EES-13 (RTN)
LA-SR-CST/LBL-94-09	6/6-10/1	CST/LBL (RTN)
LA-SR-EES-13/LV-94-10	4/25-5/26	EES-13/LV (field survey)
LA-SR-EES-13-94-11	3/1-6/1	EES-13 (training data base)
LA-SR-MET-94-12	7/25-29	Mettler (supplier)
LA-SR-EES-13-94-13	9/12-14	EES-13 (review packages)
LA-SR-EES-13/LV-TCO-94-14	8/17-19	EES-13/LV TCO (job packages)
LA-SR-CST/LBL-94-15	10/3-4	CST/LBL (DR trends)

Table XIV. Deficiencies Found Annually.

Year	Deficiencies
1990	128
1991	65
1992	22
1993	17
1994	19

Issue 2. The QAPL and Verification Coordinator met early in 1994 and discussed guidelines for improving the audit process as well as issues that needed to be looked at. These issues were also discussed at several quality meetings. These are simply recommendations to try and improve upon a process that works relatively well. The following guidelines were established:

- Audit plans would be sent out at least two weeks before the audit, the appropriate investigators of the audit would be personally involved in the planning.
- When appropriate, audit processes and systems not previously audited. Avoid auditing the same individual's work each time.
- Use QALs and YMP technicians as technical auditors if possible.
- Check for consistency between the organization chart and position descriptions, and verify that all people performing quality activities on the YMP are on the organization chart.
- Verify that personnel have had supervisor orientation and have taken the Orientation class.
- Inventory all notebooks, and audit selected ones. Routinely check data submissions, and M&TE. Verify that technical information product (TIP) record packages have been submitted and software QPs are followed.
- Start contractor's audits on a Wednesday if possible (for QAL convenience).
- Close out LBL, for their work scope is changing; close out Ohio State University for their contract was not renewed; check and see if LS-2 has done any Q work before audit is scheduled.
- Audit reports should contain a section on strengths and good practices.
- If a CAR is initiated, ensure that investigator understands problem and required resolution before audit ends.
- Leave evaluation sheet with investigators.

Issue 3. The DOE notified the Laboratory late in 1994 that the audit function will be transferred to DOE in FY95. We agreed to conduct our own audits in FY95, and to have them completed by the end of July. The Los Alamos YMP management recognizes that the internal audit program helped develop a strong quality program. We will work with the DOE to make this transition a success and to ensure this transfer of audit responsibilities to DOE will continue to support a strong quality program. We will also increase our internal surveys to supplement DOE audits, ensuring that major activities are monitored for compliance. Since funding for the audit function also supported other verification activities, such as RTN input, we must be careful to ensure that we can still meet DOE needs when budgets get realigned to reflect the transition of audits to DOE.

Issue 4. We were required to conduct a qualification audit of Yale and Penn State before they could begin work. After some discussions concerning what we should actually audit, we determined that the audit would a) compare requirements in the purchase order to the requirements in the purchase request; b) verify that the appropriate QPs and DPs had been issued and received by the appropriate personnel; c) check that the applicable training had been completed; and d) verify that personnel files comply with QP-02.5. No problems were found.

Issue 5. The deficiency report (DR) procedure, QP-16.3, was superseded by QP-16.4, Corrective Action Reports. The process essentially remained the same, although the term DR was replaced by CAR (corrective action report). The term DR has a negative connotation, whereas the term CAR is more in line with the concept used in DOE's deficiency procedure.

Issue 6. LBL personnel are working jointly with Los Alamos YMP personnel as the result of some new site characterization activities near P-tunnel at the Nevada Test Site. As the work scope developed, it became unclear whose quality program would be followed. Initially, the Los Alamos program was to be followed. Eventually, DOE directed LBL personnel to develop their own quality program which is now underway.

Issue 7. The TCO engaged in discussions with YMP quality assurance personnel on whether work plans were quality documents or not. This discussion developed into several issues: a) Was the TCO conducting quality or non-quality work, b) Should the Los Alamos procedure QP-03.25 be used for reviews by non-Los Alamos personnel, and c) What is the quality relationship between job packages (JP), test planning packages (TPP) and work plans (WPs). Most of these issues were settled when Los Alamos conducted internal survey LA-SR-EES-13-94-14. The survey team concluded that the TCO work is done in the quality arena, and DOE procedures are normally utilized. The Los Alamos procedure QP-03.25 would be used to conduct reviews until the DOE procedures could be revised. However, there remained a big issue as to whether work plans were quality (the auditors position) or nonquality documents (the TCO position). The TCO eventually agreed to withdraw all work plans and write a new procedure to cover the entire JP, TPP, and WP process.

Issue 8. In May, the QAPL authorized the Verification Coordinator to issue survey and audit plans and reports without QAPL signature. This was done in the name of empowerment and to speed up distribution times. There have been no problems with the implementation of this policy.

2.9.2 Goals for 1994.

- Have QALs visit subcontractors periodically.
- Continue to reduce the number of deficiencies open at any one time.
- Conduct surveys to ensure compliance to new QPs.
- Encourage technical personnel to participate as auditors.
- Determine if QALs need to participate as auditors in one audit.
- Revise the data base for tracking deficiency reports.

In general, QALs visit contractors three to four times per year. The number of open deficiencies fluctuates between ten and twenty, but late in 1994, we were able to get the number of open deficiencies under ten. Several surveys were conducted to verify compliance to the new QARD, and procedure revisions and RTN entries were found to be adequate. Although two technical personnel were used as auditors, verification personnel were mostly involved with performing compliance audits. QALs were encouraged to participate as auditors if they had the time, and two were able to do so. It is becoming increasingly difficult to ask QALs to conduct audits, and since this function is being transferred to DOE, this practice will be discontinued next year. The data base for deficiencies was modified to reflect the new "CAR" (instead of DR) nomenclature. Development of a new program to handle this data base was abandoned when DOE announced that the audit function would be transferred. Over 95% of the goals were realized.

2.9.3 Goals for 1995.

- Reduce the number of outstanding deficiencies to less than ten.
- Revise the appropriate DOE procedures so that work plans are not a contentious issue.
- Involve investigators more on the planning side of audits.
- Include sections in audit reports on good practices.
- Leave an evaluation sheet with auditees.

2.10 Efforts to Increase Awareness of the Quality Program. Two major activities were used to foster recognition of the quality program. The first was the annual YMP meeting on January 27 to address YMP issues. Over sixty YMP personnel attended. Presentations included topics on quality assurance, volcanic risk simulations, and the TCO (Table XV). The second activity was an all hands meeting, held in October. The agenda included an update on quality assurance activities, the FY-95 budget, and the new management at DOE (i.e. the M&O contractor TRW Environmental Systems [TRW]) and its impact on Los Alamos. In August, L. Berkowitz, TRW Environmental Safety Systems, hosted two licensing workshops.

2.10.1 Issues.

Issue 1. The Los Alamos YMP information brochure ("The Quality Connection") was not published due to funding constraints and other commitments. The brochure provides information on new regulations, current YMP events, and discussions on quality issues. This brochure has been a successful method of informing Los Alamos YMP personnel of quality issues, but has not been published regularly. This probably dilutes its message. It remains difficult for the QAPL to find time to allocate for providing this publication.

2.10.2 Goals for 1994.

- Hold one annual all hands meeting.
- Publish "The Quality Connection" at least twice.

Two all hands meetings were held; however no "Quality Connection" brochures were published. One goal was exceeded and one goal was not met.

2.10.3 Goals for 1995.

- Hold one annual YMP meeting and one all hands meeting.
- Evaluate the usefulness of "The Quality Connection".

Table XV. Program Agenda for the Annual YMP Meeting

Subject	Speaker
All You Ever Wanted to Know about the New QA Program	Stephen L. Bolivar, QAPL
Life in Las Vegas- Volcanic Risk Simulations	Bruce Crowe, Principal Investigator
Life at Yucca Mountain- The Latest on the Exploratory Shaft Facility (ESF)	Ned Elkins, Deputy TPO
Cl^{36} - Past, Present and Future	June Fabryka-Martin, Principal Investigator
The Latest Budget News	Julie A. Canepa, TPO

3.0 TREND ANALYSIS

3.1 Introduction. The purpose of this section is to summarize the four trend reports issued in 1994. DOE and internal audit and survey reports, stop work orders, and other quality assurance documents, such as the corrective action report (CAR) log, are examined periodically to determine if any adverse trends exist and to provide the status of any previously recognized adverse trends.

An adverse trend is defined as a repetitive or frequent occurrence of a condition adverse to quality, or the occurrence of similar conditions adverse to quality that suggest a systematic weakness in the quality program. Adverse trends in this status report can be compared with past and future reports to evaluate the quality program.

The number of deficiencies found during a calendar year can provide a first approximation of the status of a quality assurance program. However, a quality assurance program consists of many parts in which problems may occur (e.g. program development, verification activities, training, etc.). This section examines not only the frequency of deficiencies but also includes comparisons of Los Alamos groups with other participants.

3.2 Methodology. The Los Alamos CAR log was examined to determine the status of deficiencies. Individual CARs were then examined and categorized. First, in accordance with previous progress reports, CARs are grouped according to the quality administrative procedure the deficiency occurred in. The procedure's revision number and the section in which the violation occurs are recorded, if known (Appendix D). This allows identification of procedures that are habitually violated. Deficiencies are then categorized according to the Los Alamos group that the deficiency was assigned to. This category can be examined to identify groups that are associated with large numbers of deficiencies.

The probable causes of deficiencies are examined and categorized into (a) not trained to procedure, (b) failure to follow procedural guidance, (c) conflicting procedural guidance, and (d) oversight. There also is a category for deficiencies written against measuring and test equipment (M&TE) out of calibration. It is possible for a single deficiency to occur in more than one category.

A similar categorization is done for CARs received from DOE audits and surveys. However, a group category is normally not identified because these deficiencies usually represent a Laboratory-wide problem.

Lastly, DOE and Los Alamos audit, survey, and trend reports, and Los Alamos conflict resolution and stop work order logs are examined. Most deficiencies are captured in the Los Alamos CAR log, therefore these reports are used predominantly to identify deficiencies that have been fixed during audits and surveys. Conflict resolution and stop work order logs are examined on a case by case basis because occurrences in these logs may not be directly related to a quality program deficiency.

3.3 Internal Audits and Surveys. During 1994, seventeen audits were conducted. All audit reports were issued within two to three weeks after the audit was completed. Table XVI lists the findings.

Table XVI. Summary of Internal Audit Findings.

Audit Number	Group	Deficiencies Identified	CAR Issued	Criteria Examined and Status
LANL-AR-94-01	EES-1 (YU)	none	none	1,2,4-7,12,17,SII,SIII; effective
LANL-AR-94-02	EES-13 (TCO)	none	none	1,2,4-7,12,17,SII,SIII; effective
LANL-AR-94-03	EES-1 (PSU)	none	none	2,4; effective
LANL-AR-94-04	EES-1	four	none	2,4-7,12,16,SIII; effective
LANL-AR-94-05	CST (SU)	ten	CARs-243, -244	2,12,16; effective SII,III; need improvement
LANL-AR-94-06	CST (LBL)	none	none	16; inadequate
LANL-AR-94-07	EES-13	one	CAR 246	1,2,5,6,17; effective
LANL-AR-94-08	EES-13, Volcanism	none	none	2,5,6,17,SII,SIII; effective
LANL-AR-94-09	EES-13, Volcanism (UNM)	none	none	2,6,17,SII,SIII; effective
LANL-AR-94-10	EES-13, Volcanism (UCR)	none	none	2,6,17,SII,SIII; effective
LANL-AR-94-11	EES-13/LV Volcanism	none	none	2,6,17,SII,SIII; effective
LANL-AR-94-12	LS-2	none	none	No activity, audit canceled
LANL-AR-94-13	CST (HGC)	eight	none	2,5,6,17,SII; effective 12,SIII; need improvement
LANL-AR-94-14	CST	ten	CARs 247, -248,- 249, -250	2,12,16; effective 4,SII,SIII; need improvement
LANL-AR-94-15	EES-5	none	none	2,4-7,12,17,SII,SIII; effective
LANL-AR-94-16	EES-4	one	CAR 251	2,4-7,12,17,SII,SIII; effective
LANL-AR-94-17	EES-15	none	none	No activity, audit canceled

Most of the identified deficiencies problems are minor and have to do with lack of attention to detail. However, one situation deserves comment. In general, the number of CARs has decreased when compared to 1993 levels. To see if a problem truly exists, specific deficiencies have to be examined. However, because all QPs were revised in 1994, it may be several months before any adverse trends become apparent. The pervasive lack of attention to detail is a Laboratory-wide issue, and it will cease only when the achievement of quality is an everyday part of an investigator's normal routine.

3.4 Internal Deficiencies. In 1994, nineteen deficiencies were identified (Table XVII). This compares to seventeen CARs issued in 1993 and twenty-two in 1992. The CARs issued since 1990, with the exception of 1994, show an annual decrease as displayed in Fig. 2. The slight increase in 1994 might be attributed to the implementation of essentially a new quality program at the beginning of the year when all procedures were revised in response to changes in the QARD. If this is the case, then totals in 1995 should decrease as investigators become accustomed to the new rules.

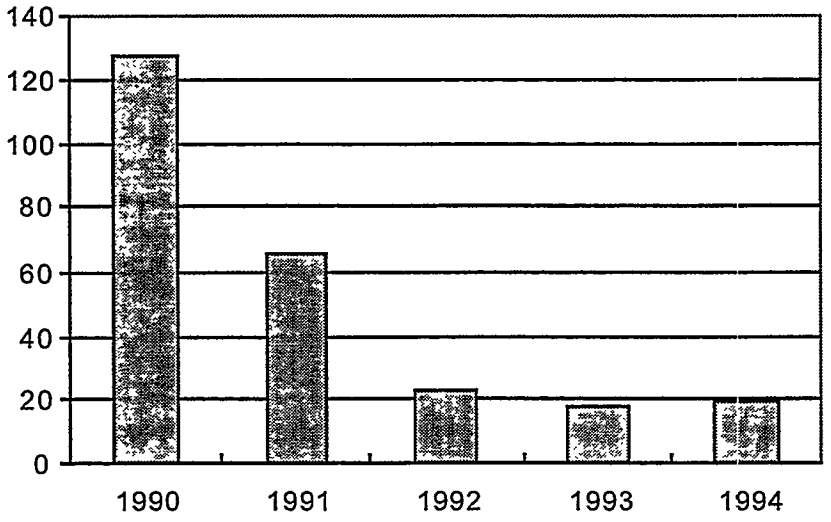


Fig. 2. Internal deficiencies issued since 1990. The actual data is given in Table XIV.

3.5 Stop Work Orders and Conflict Resolutions. Stop work orders (SWOs) are not used as a punitive measure, but rather to selectively stop activities. SWO-LA-08, which was issued against the computational data section of the software procedures, was lifted in June when the software procedures were revised. This resolution was based on a management decision that data control will be through the notebook procedure rather than through the configuration management process. No new conflict resolutions occurred (Table XVIII).

3.6 DOE Audits, Surveillances, and Issued Deficiencies. The DOE conducted two surveillances and one audit in 1994 (Table XIX). Although seven deficiencies were fixed during the audit and five CARs were written, Los Alamos performed satisfactorily in the audited criteria. The surveillances were conducted to check on the data process (YMP-SR-94-052) and the work package process (YMP-SR-95-006). There was one CAR issued against the data

process for having qualified data before the quality program was approved. One CAR was also issued against the work package process, but it was later determined that this was a

Table XVII. Internal Deficiencies Issued in 1994.

Deficiency Report	Group	Description
CAR 233	EES-1	Investigator did not get M&TE form from coordinator
CAR 234	EES-1	Notebook entries in error
CAR 235	CST (LBL)	The annual notebook reviews not done
CAR 236	CST (LBL)	M&TE not identified correctly in notebook
CAR 237	CST (LBL)	Notebooks not put into records system in timely manner
CAR 238	CST (LBL)	DPs not referenced in notebooks
CAR 239	CST (LBL)	TIP package not prepared correctly
CAR 240	LATA	Did not follow QP-08.3 for getting tracking number
CAR 241	CST (LBL)	Purchase request not signed by QAL
CAR 242	CST	Balance out of calibration
CAR 243	CST (SU)	Bill of lading number not listed in notebook
CAR 244	CST (SU)	Notebook format not followed
CAR 245	CST	Two co-authors not trained to QP-06.3
CAR 246	EES-13, LATA	Training not up-to-date for QPs-2.x (data base glitch)
CAR 247	CST	Procurement documentation inadequate
CAR 248	CST	Procurement record packages incomplete
CAR 249	CST	Q requirements missing in procurement record packages
CAR 250	CST	Samples not properly stored
CAR 251	EES-4	Prototype work not identified in notebook

DOE issue and the CAR was withdrawn and reissued to DOE. The 1994 DOE CAR status activity is shown in Table XX. Adverse trends are described in Section 3.7.

3.7 Status of Adverse Trends and Significant Conditions Adverse to Quality. There were no significant conditions adverse to quality (SCAQ) issued in the last twelve months. In our program, only one SCAQ has been issued (for lack of a software program), and it was closed in 1990.

Internal CARs and DOE deficiency reports issued in the last twelve months were examined (Tables XVII and XX). The majority of deficiencies represent isolated instances of nonconformance. However, there are several CARs issued against infractions on procurement. These deficiencies were evaluated and it was determined that an adverse trend existed. This is identified as AT-94-01 in Table XXI. The procurement procedure was revised to resolve the CARs and the adverse trend subsequently was closed.

There are also several deficiencies issued against two subcontractors. There are also several deficiencies against notebooks for several different groups. In these instances, the deficiencies are relatively minor and simply can be attributed to "lack of attention to detail" or oversight. This is not an adverse trend but it does signify that a potential problem may be developing. The QAPL has notified the appropriate QALs, who will in turn monitor their investigators. If this problem continues, it may be necessary to initiate some type of training. However, these problems are very minor in nature and must be put into proper perspective. They do not represent a breakdown of the quality program.

At the beginning of 1994, all procedures were revised and reissued to satisfy the new QARD. We expected that the number of deficiencies in our quality program would increase, since these revisions represented a new baseline. However, our verification personnel have found no major problems.

3.8 Participant Comparisons. Many factors contribute to the effectiveness of a Participant's quality program, however, the Los Alamos quality program favorably compares to other Participants' programs when one examines the total number of deficiencies identified or resolved during YMP audits and surveillances for calendar year 1994. Discussion of this comparison follows.

To determine the status of the Los Alamos quality program with respect to other Project Participants' programs, the number of deficiencies identified during 1994 YMP audits were examined for each Participant. Figure 3
displays data for deficiencies issued during annual audits. These data include deficiencies resolved during audits. The deficiencies are scaled, i.e. those resolved during audits are assigned one point, and those reported in a formal CAR are assigned two points.

Unfortunately, Fig. 3 gives a somewhat biased view of a Participant's program. The figure does not include CARs issued as the result of surveillances or other assessment activities. The US Department of Energy Office of Civilian Radioactive Waste Management (1995) issued a report that tabulates all CARs issued to Participants (Fig. 4) for FY94 (note: Fig. 3 is for calendar year 1994). This is probably a better representation of a Participant's overall program. However, each Participant conducts unique work for the YMP, thus comparisons are not truly indicative of performance, they only indirectly indicate the overall health of an individual Participant's quality program.

Another way to examine increase in performance might be to look at trends, i.e. are the total numbers of deficiencies (both resolved and CARs) increasing or decreasing annually. CARs issued to Los Alamos for the period 1987 to 1994 are displayed in Fig. 5. The number of deficiencies resolved during audits (i.e. resolutions and closures), generally decreases from 1987 to 1993. The number of CARs issued also decreases from 1987 to 1993. In 1994, there is a small increase in the number of deficiencies. This was to be expected since the entire quality program was revised and new procedures issued in January 1994. As discussed in other sections of this report, there are no major deficiencies noted that might suggest a breakdown of the quality assurance program. Thus, one would expect the total number of deficiencies to decrease in 1995.

Table XVIII. Status of Los Alamos Stop Work Orders (SWO) and Conflict Resolutions (CR)

SWO or CR	Description	Status
SWO-LA-01	Software Stop Work	Closed 1-28-91
SWO-LA-02	SEA failed to follow QPs in criterion two	Closed 3-4-92
SWO-LA-03	Volcanism/USGS failed to follow QPs	Closed 11-3-93
SWO-LA-04	HydroGeoChem had inadequate quality program	Closed 11-4-90
SWO-LA-05	Bid evaluation section missing in QP-04.5	Closed 12-15-92
SWO-LA-06	QP-03.5 and QP-03.17 are in conflict	Closed 12-15-92
SWO-LA-07	Prevents sending records to YMP until QP-17.3 revised	Closed 3-4-92
SWO-LA-08	Against SQAP, Fig. 1 & Computational Data QP	Closed 5-20-94
LA-CR-001	Purchase request protocol	Resolved

Table XIX. 1994 DOE Audits and Surveys of the Los Alamos YMP.

Activity	Date	Result
Survey YMP-SR-94-052	August 3-5	Survey was to examine our data process. One CAR issued.
Audit YMP-94-08	August 15-19	Compliance audit. Five CARs issued; seven deficiencies fixed during audit.
Survey YMP-SR-95-006	December 9	Survey on work plan process. CAR issued but later withdrawn and reissued to DOE.

Table XX. Status of Los Alamos Corrective Action Reports.

Deficiency	Description	Status
CAR-YM-94-078	Record packages do not contain needed documentation	Closed 1-25-95
CAR-YM-94-079	pH meters calibrated using improper buffer solution	Closed 1-27-95
CAR-YM-94-080	QP-04.6 does not meet RTN requirements	Closed 1-17-95
CAR-YM-94-081	Did not evaluate data according to QP-03.5	Closed 1-22-95
CAR-YM-94-082	Software design package does not identify traceability	Closed 2-6-95
CAR-YM-95-013	Work packages not controlled adequately	Transferred to DOE

Table XXI. Adverse Trends.

Trend	Trend Description	Status
AT-91-01	Excessive number of DRs issued against QAPP (QAPP and QPs not consistent).	Closed (CAR-90-041 closed on 12-7-93).
AT-91-02	Excessive number of DRs issued against QP-02.5. QP-02.5 needs to be revised.	Closed (QP-02.5 issued on 9-30-91).
AT-91-03	Excessive number of DRs issued against QPs-03.3 and -03.2. Procedures hard to follow and Project guidance for QP-03.3 has changed. Procedure needs to be revised.	Closed (QP-03.23 issued on 3-16-92; QPs-03.2 & -03.3 superseded).
AT-91-04	Excessive number of DRs issued against QP-03.5. Conflicting guidance for notebook corrections with QP-17.3. Need to revise QP-03.5.	Closed (QP-03.5 issued 12-7-92)
AT-91-05	Excessive number of DRs issued against QP-04.1 in 1990. Requirements are confusing and overly restrictive. Need to revise QP-04.1.	Closed (QP-04.1 superseded by QP-04.4 on 11-15-91 & QP-04.5 on 12-23-91).
AT-91-06	Excessive number of DRs issued against QP-12.1. Procedure is difficult to follow. Need to revise QP-12.1.	Closed (QP-12.1 issued on 5-8-92).
AT-91-07	Excessive number of DRs issued against QP 17.3. Procedure needs to be simplified and new Project requirements incorporated.	Closed (QPs-17.4 & -17.5 issued on 2-28-92; SWO-LA-07 lifted 3-4-92).
AT-93-01	Excessive number of DRs issued against software program. Software procedures to be revised.	Closed (Software QPs revised 1-31-94)
AT-94-01	Excessive number of DRs issued against the procurement process.	Closed (QP-04.6 revised 12-94)

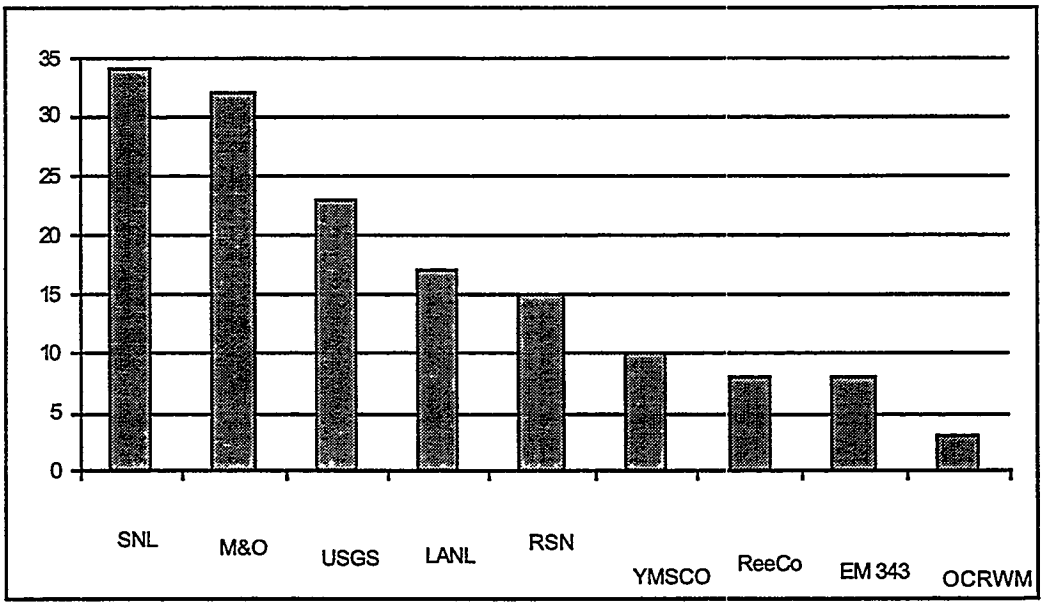


Fig. 3. Deficiencies (i.e. CARs) resulting from DOE audits in 1994. CARs are weighted; those formally issued are multiplied by two, whereas those resolved during audits are multiplied by one. (Key: SNL=Sandia National Laboratories; M&O= Management and Operations Contractor; USGS= United States Geological Survey; LANL= Los Alamos National Laboratory; RSN= Raytheon Services Nevada; YMPO= Yucca Mountain Project Office; REECO= Reynolds Electric Company; EM 343= Department of Energy, Washington DC group; OCRWM= Office of Civilian Radioactive Waste Management (headquarters).

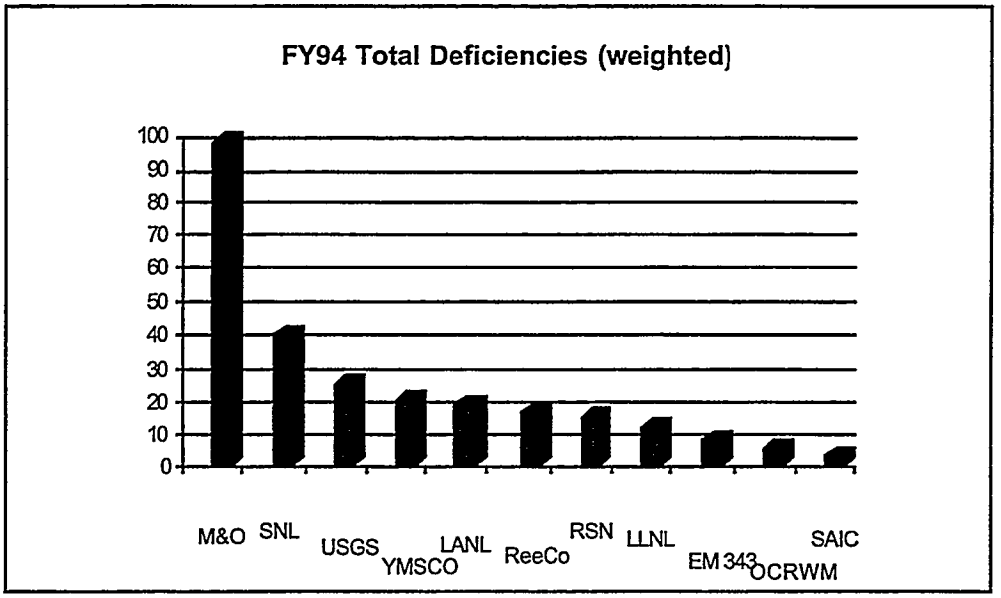


Fig. 4. CARs resulting from all DOE verification activities. The CARs are not weighted. (Key: SAIC= Scientific Applications International Corporation; LLNL= Lawrence Livermore National Laboratory; LANL= Los Alamos National Laboratory; EM-343 =a Department of Energy, Washington DC group; USGS= United States Geological Survey; YMPO= Yucca Mountain Project Office; OCRWM= Office of Civilian Radioactive Waste Management; SNL= Sandia National Laboratories; REECO= Reynolds Electric Company; RSN= Raytheon Services Nevada; M&O= Management and Operations Contractor).

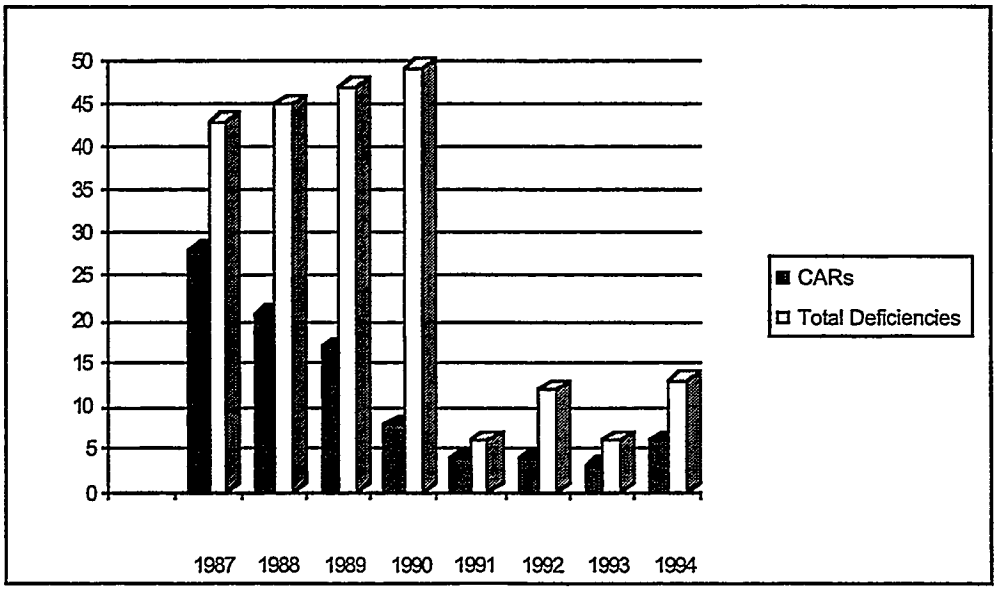


Fig. 5. CARs issued to Los Alamos by the DOE. Plot shows both total deficiencies identified (solid bars) and CARs issued (stippled bars). Deficiencies were identified in audits and surveys. They are not weighted.

3.9 Group Trends. During the calendar year the Los Alamos Verification Coordinator conducted several internal audits of various groups, including subcontractors, working on Los Alamos YMP activities. The number of internal CARs issued against these groups for the last three years is shown in Table XXII.

The number of deficiencies identified in a particular group reflects several factors. For example, management groups might have more deficiencies simply because all activities are coordinated through these offices. Certain groups might have several deficiencies simply because of the volume of activity associated with their activity. In other words, the number of deficiencies identified in a particular group must be placed in overall context before it can be considered significant.

The number of CARs issued to any respective group in 1994 is about the same as for 1993, although groups CST and LBL both show a slight increase in either total deficiencies or number of CARs. "Group CST" actually comprises five groups in CST Division. The increase in their deficiencies predominately resulted from one individual not following the procurement procedure. Group LBL is a subcontractor. They are completing activities on their current scope, and these deficiencies mostly identified improper preparation of records packages. As with the 1993 status report (Bolivar, 1995), the number of deficiencies resolved and closed during audits is still significantly high for several groups. The majority of these problems were due to a lack of attention to detail, mainly with records packages for notebooks. This problem is compounded by implementing essentially a new quality program in 1994. A records management class was developed and provided to over 90% of the staff. This class stressed the importance of attention to detail, however, the effectiveness of the class will probably not be evident until 1995 (many people took the class after they were audited in 1994).

3.10 Possible Adverse Trends Associated with Criteria or Procedures. The CAR log was examined and deficiencies were categorized by assigning them to the respective QARD criterion they are associated with. Numerous CARs associated with a criterion does not necessarily signify an adverse trend, but does help identify areas of concern. Figure 6 shows this data grouped by criteria; obviously criteria six and supplement III are possible areas of concern (criteria 4&7, 12, and SII are slightly up compared to 1993 levels). However, to determine if an adverse trend exists, the data must be examined in greater detail.

Appendix D lists the number of deficiencies noted against respective QPs. Table XXIII identifies those current procedures for which more than two deficiencies were identified in 1994. An adverse trend might be suspected if the number of deficiencies associated with any one QP is large; however, recognition of adverse trends by this method is very subjective. One must look at the reasons for each deficiency before a true adverse trend can be identified.

A possible adverse trend might be suggested by the magnitude of deficiencies associated with a specific procedure, e.g. there are numerous deficiencies associated with QPs-03.5, -06.2 and -06.3. Procedure QP-03.5 corresponds to Supplement III in Fig. 6. In 1994, we made a conscious effort to examine every single notebook. Subsequently, we found several errors, but most were caused by oversights of a very minor nature. Almost every deficiency was resolved during the audits (as opposed to writing a formal CAR). However, we have instituted a training class on records management that addresses these kinds of problems and hopefully we will see these totals decrease in 1995. The number of deficiencies in criterion 6 (QPs-06.2, -06.3) are also numerous. These deficiencies are associated with several individuals not putting a specific document (i.e. a single piece of paper listing review criteria) into their record packages. The problem in itself was minor (the list is no longer required) and the corresponding procedures have been revised. Thus, these totals should also decrease in 1995. The other numbers are not considered excessive and merely represent minor infractions (these are described in detail in the quarterly trend reports).

Table XXII. Los Alamos Deficiencies by Group.

Group	1991	1992	1993	1994
EES-1	5 (5 fixes)	2 (3 fixes)	3 (6 fixes)	2 (7 fixes)
EES-4	2 (1 fix)	0 (1 fix)	1	1 (1 fix)
EES-5	7	0 (4 fixes)	0	0
EES-13 Management	10	0 (1 fix)	3 (9 fixes)	2 (3 fixes)
EES-13 Software	N/A	7 (1 fix); SWO-08	1	1
EES-13/LV TCO	0 (4 fixes)	0	1 (8 fixes)	0 (2 fixes)
EES-13/LV, VOLC	0 (3 fixes)	2 (5 fixes)	0 (18 fixes)	0 (1 fix)
EES-15	1 (1 fix)	0 (1 fixes)	0	0
CST	10 (4 fixes)	1	3 (17 fixes)	8 (10 fixes)
UC-Riverside	0	0	0	0
UNM	3 (3 fixes)	1 (3 fixes)	0 (1 fix)	0
LBL	5 (8 fixes)	1 (3 fixes)	0 (18 fixes)	6 (22 fixes)
SU	3 (3 fixes)	N/A	1 (13 fixes)	2 (10 fixes)
HGC	2 (2 fixes)	1	0	0 (8 fixes)
LATA	NA	NA	NA	4
M&TE	1	0	1	2
Records	1; SWO-07	1	2	0
Controlled Documents	0	0	0	0
Training	1	0	0	2
Audits	3	1	1	0
Quality Organization	7; SWO-05, 06	2	0	0

Key: N/A= Not applicable; SWO= Stop Work Order; All CST groups combined under CST; Deficiencies fixed during audits are listed in parentheses.

Table XXIII. Deficiencies Associated with Procedures (only those with more than 2 deficiencies are listed).

Plan or Procedure	Number of Deficiencies
QP-02.5	3
QP-02.7	5
QP-03.5	26
QP-04.6	6
QP-06.2	11
QP-06.3	22
QP-8.3	3
QP-12.3	7

3.11 Trends Identified with Probable Cause Determination. After examining all Los Alamos internal CARs in 1990, it became evident that probable causes could be placed into a select number of categories. This assumes that the resolver of a deficiency (normally a CAR) did a correct probable cause determination, and this may not be valid for all deficiencies. However, this approach does reveal some interesting information.

The probable cause categories are (a) not trained (Table XXIV), (b) failure to follow procedural guidance (Table XXV), (c) conflicting procedural guidance (Table XXVI), (d) oversight (Table XXVII), and (e) M&TE (Table XXVIII). These data are plotted in Fig. 7. Large numbers of associated deficiencies do not necessarily identify an adverse trend; as mentioned above, the data must be placed into context of the overall program.

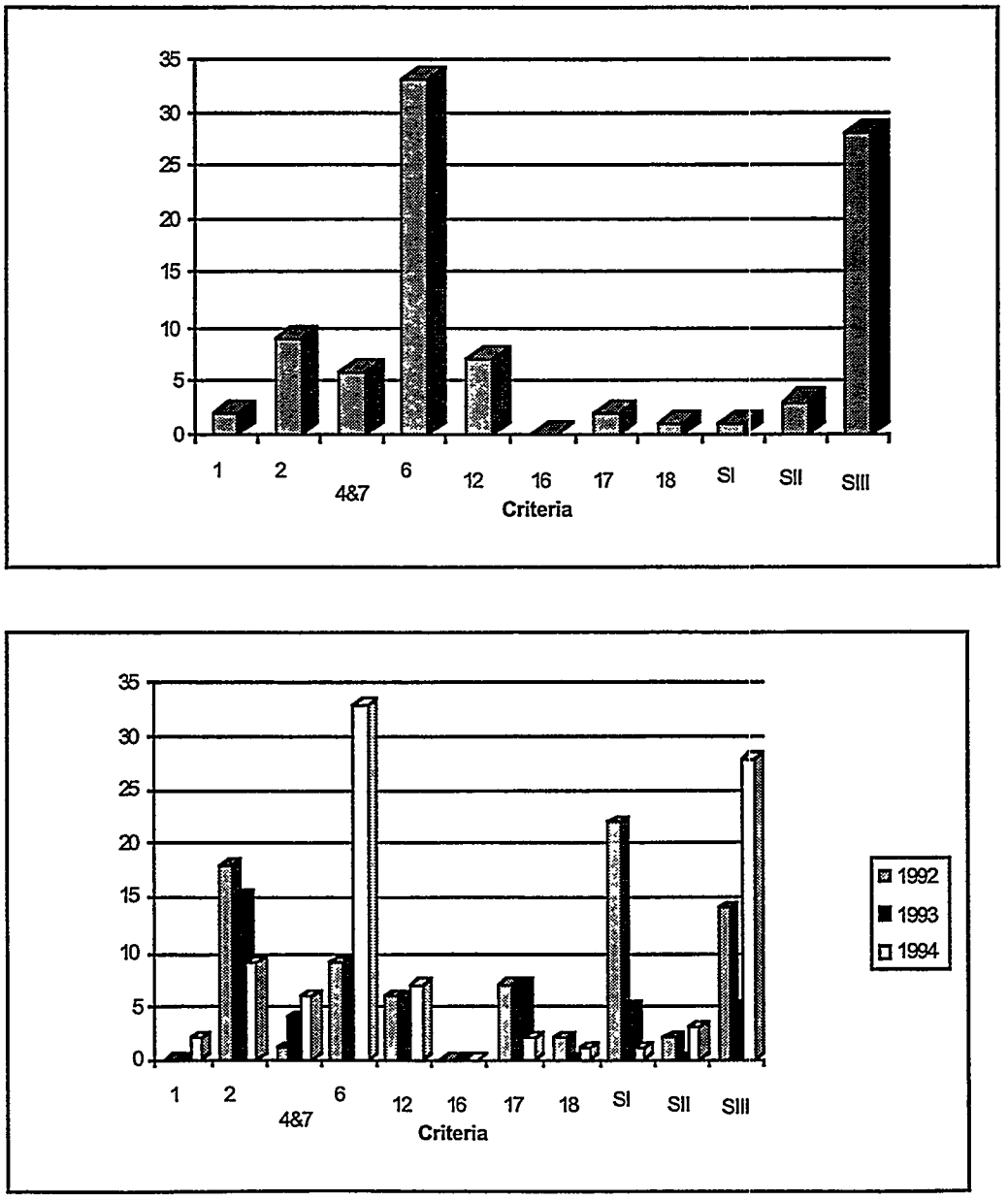


Fig. 6. Internal deficiencies correlated by criteria. Top graph shows deficiencies associated with respective QARD criteria for 1994, whereas bottom graph shows the data for 1992-1994. Deficiencies include both those formally issued and those resolved during internal audits.

The number of probable causes attributed to lack of training (Table XXIV), conflicting procedural guidance (Table XXVI) and oversight (Table XXVII) has decreased compared to 1993 levels. The deficiencies attributed to oversight dramatically decreased compared to totals for both 1992 and 1993. The deficiencies attributed to M&TE (Table XXVIII) increased to three, compared to one in 1993, and three deficiencies are no cause for alarm. These totals suggest the quality program is under control and improving, and they do not merit further discussion.

There is a noticeable increase in deficiencies associated with failure to follow procedural guidance. Many of these deficiencies can be attributed to minor problems resolved during audits and surveys, but some are also attributable to other problems (Table XXV). Possibly these problems can solely be attributed to the implementation of recently revised QPs, i.e. all QPs were revised and issued in January 1994. Since there are not similar problems with training, oversight, M&TE, etc. it appears plausible that this is the case. The QAPL is aware of these findings and has asked the QALs to help investigators identify changes in the new procedures, and pay more attention to detail. A training class for QP 17.6, Records Management, was initiated and by the end of 1994, over 90% of all YMP personnel had attended the class. If these actions do not result in a noticeable decrease in deficiencies associated with failure to follow procedural guidance in 1995, then further actions will be taken.

Table XXIV. Deficiencies Attributed to Lack of Training (numbering scheme explained in Appendix D).

1992		1993		1994	
Deficiency/ Associated Procedure		Deficiency/ Associated Procedure		Deficiency/ Associated Procedure	
92-13-001	QP-03.5	DR 216	QP-17.4	CAR 245	QP-02.5
DR 213	QP-06.2	DR 216	QP-12.1		QP-02.7
DR 205	QP-02.7	DR 219	DP-101		QP-02.11
DR 207	LBL-DP-13	DR 221	QP-06.3	CAR-246	QP-06.2
DR 214	QP-06.2	CAR-93-051	QP-17.4		QP-06.3
DR 213	QP-06.2	93-04-04	DP 606	CAR-242	QP-12.3
		93-12-05	QP-06.1	SR-94-10-01	QP-02.7
		93-09-04	QP-06.1	AR-94-04-01	DP-25
		93-05-01	QP-02.7	AR-94-04-02	DP-110
		93-10-03	QP-02.11	AR-94-05-07	QP-12.3
		93-12-03	DP 86	AR-94-05-08	QP-08.1
		93-09-03	QP-04.4		
		93-10-02	QP-02.7		

Table XXV. Deficiencies Attributed to Failure to Follow Procedural Guidance (numbering scheme explained in Appendix D).

1992		1993		1994	
Deficiency	Deficiency Resolved	Deficiency	Deficiency Resolved	Deficiency	Deficiency Resolved
DR 194	92-001-2	DR 217	93-01-01	CAR 235	YA-94-08-01
DR 196	92-002-1	DR 225	93-07-01	CAR 239	YA-94-08-02
DR 197	92-002-2	DR 227	93-09-02	CAR 240	YA-94-08-03
DR 198	92-002-5	DR 222	93-10-03	CAR 241	YA-94-08-05
DR 200	92-003-3		93-12-01	CAR 242	YA-94-08-06
DR 202	YA-92-12-01		93-12-04	CAR 243	YA-94-08-07
CAR-92-058	YA-92-12-02		93-10-01	CAR 244	AR-94-04-04
DR 206	YA-92-12-03		93-10-04	CAR 237	AR-94-04-01
DR 209	92-006-3			CAR-94-083	AR-94-05-01
DR 211	92-10-002			CAR-94-078	(four)
DR 214	92-10-003			CAR-94-082	AR-94-05-05
DR 215	92-13-002			CAR 233	AR-94-05-06
DR 208				CAR 236	AR-94-14-01
DR 210				CAR 237	(six)
				CAR 247	AR-94-13-01
				CAR 248	(eight)
				CAR 249	SR-94-09-02
				CAR 250	(five)
					SR-94-13-01
					(thirty)

Table XXVI. Deficiencies Attributed to Conflicting Procedural Guidance (numbering scheme explained in Appendix D).

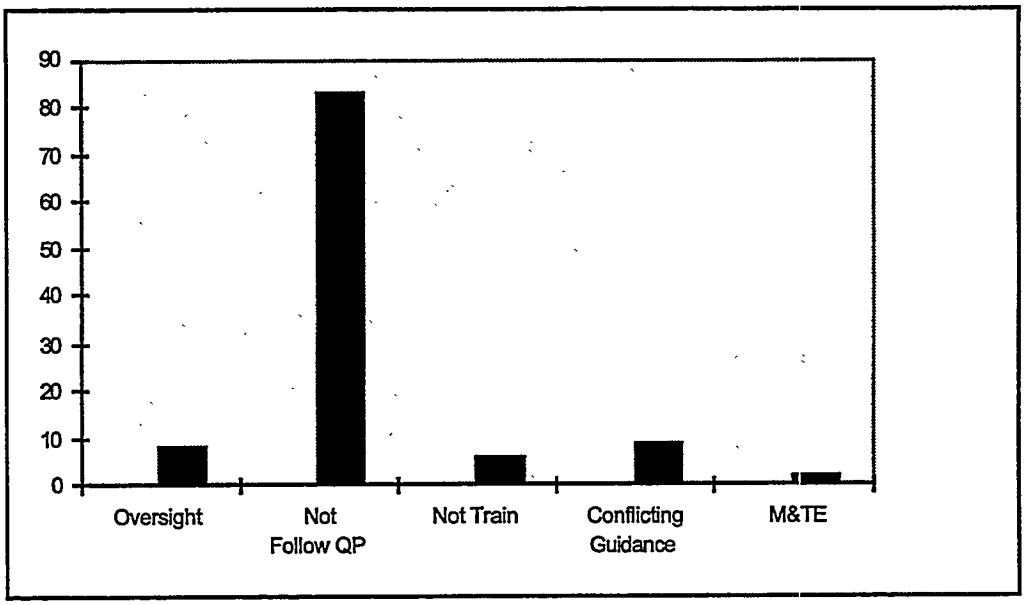
1992		1993		1994	
Deficiencies	Deficiencies Resolved	Deficiencies	Deficiencies Resolved	Deficiencies	Deficiencies Resolved
CAR-92-057		CAR-93-049	YA-93-11-1	CAR-94-083	YA-94-08-04
CAR-92-058		CAR-93-050	93-04-03	CAR-94-078	YA-94-08-07
CAR-92-018		CAR-93-051		CAR-94-079	
DR 210		DR 226		CAR-94-081	
DR 211		DR 218		CAR 234	
DR 199		DR 220		CAR 244	
DR 212		DR 221		CAR 243	
		DR 222			
		DR 232			

Table XXVII. Deficiencies Attributed to Oversight (numbering scheme explained in Appendix D).

1992		1993		1994	
Deficiencies	Deficiencies Fixed	Deficiencies	Deficiencies Fixed	Deficiencies	Deficiencies Fixed
DR 195 DR 197 DR 200 DR 201 DR 204 DR 205 DR 206 DR 208 DR 210 DR 212 CAR-93-019	92-001-1 92-001-3 92-002-3 92-002-4 92-003-1 92-004-1 92-004-2 92-004-3 92-006-2 92-006-3 92-006-4 Y-92-19-01 Y-92-19-02 Y-92-19-03 Y-92-19-04 92-10-001 92-17-001 92-08-001	DR 217 DR 223 DR 224 DR 229 DR 230 DR 231	YA-93-11-02 YA-93-11-03 93-12-06 93-02-01 93-02-02 93-09-05 93-04-01 93-04-02 93-09-06 93-12-05 93-06-01 93-06-02 93-07-02 93-10-02 93-09-01 93-12-02 93-12-04 93-09-03 93-10-04	CAR 242 CAR 240 CAR 238 CAR 251	AR-94-04-03 SR-94-09-01 SR-94-09-07 SR-94-11-01 SR-94-11-02

Table XXVIII. Deficiencies Attributed to M&TE (numbering scheme explained in Appendix D).

1992		1993		1994	
Deficiencies	Deficiencies Fixed	Deficiencies	Deficiencies Fixed	Deficiencies	Deficiencies Fixed
DR 203	Bal PN757327	DR 228	Bal PN620505	CAR 242 CAR 233 CAR 236	Bal PN817330 NA NA



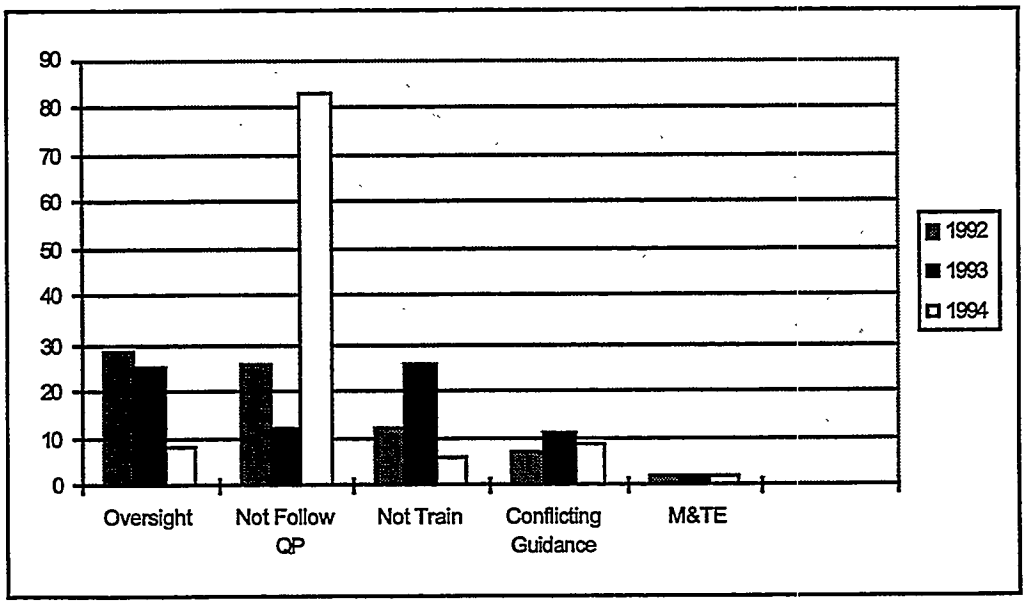


Fig. 7. Deficiencies Assigned to Probable Cause Categories. Top graph shows groupings for 1994. Bottom graph shows data for 1992 -1994.

4.0 SUMMARY

The Los Alamos quality organization, consisting of the contributors to this report, met periodically to discuss and resolve YMP quality issues. Documentation of the results of these meetings are discussed herein. In 1994, this team revised its charter, established vision and mission statements, and as a result of a self assessment, instituted a goal/performance process. Efforts were also spent on making several processes more efficient. However, the most time consuming activity was the revision of procedures in response to programmatic reviews of the requirements traceability network (RTN) matrix. Resolution of 130 comments resulted in twenty-nine procedure revisions. Many of the revisions simply involved minor changes. However, software, procurement, measuring and test equipment, and the data submittal processes required major procedural revisions. In the training arena, minor problems were resolved with the electronic data base and we should be better able to track project training. Records personnel submitted 800 records to the Project record's repository. The rejection rate improved from 0.5% to a very low 0.0013%. Efforts in 1995 will probably be directed towards improving the software certification procedures and better understanding the RTN matrix process.

Verification activities have helped the quality organization identify specific problems in the Los Alamos YMP. These problems are addressed as resolution to deficiencies issued as part of internal or DOE verification activities. In 1994, the DOE personnel conducted one audit and two surveys of Los Alamos activities. Five corrective action reports (CARs) were issued. Los Alamos verification personnel internally conducted seventeen audits and sixteen surveys. This resulted in nineteen deficiencies. The cited deficiencies do not indicate any major problems with the quality program, but there was an increase in deficiencies associated with lack of attention to detail. A mandatory training class was developed and most YMP personnel attended the class. This should result in fewer of these "minor deficiencies" in 1995. Audited individuals were responsive and knowledgeable to YMP quality assurance requirements.

Trend analysis reports were issued quarterly in 1994 and the results are summarized herein. One open adverse trend, identified in early 1993, was closed. This status report includes comparisons between participants with respect to the number of corrective action reports issued as well as comparisons between individual groups at Los Alamos. When the number of corrective action reports issued by the DOE is examined, the number issued to the Los Alamos YMP quality program compares favorably to the number of corrective action reports issued to other participants (this is a general comparison because scopes of work differ and direct comparisons would be difficult). Over the last four years, the number of both project and internal corrective action reports issued to Los Alamos personnel has generally decreased. This supports the view that Los Alamos personnel are meeting the quality requirements of the YMP and improving annually upon their performance.

The Los Alamos YMP, as characterized in this report, is performing satisfactory work for the Yucca Mountain Site Characterization Project. The total number of deficiencies issued during DOE and Los Alamos audit and survey activities are decreasing over time, which shows that Los Alamos personnel are improving the processes used to meet quality assurance requirements.

5.0 REFERENCES

Bolivar, S. L, 1992, Los Alamos National Laboratory Yucca Mountain Site Characterization Project 1991 Quality Program Status Report, Los Alamos National Laboratory Report LA-12344-MS, 113p.

Bolivar, S. L., 1994, Los Alamos National Laboratory Yucca Mountain Site Characterization Project 1992 Quality Program Status Report, Los Alamos National Laboratory Report LA-12703-SR, 126p.

Bolivar, S. L., 1995, Los Alamos National Laboratory Yucca Mountain Site Characterization Project 1993 Quality Program Status Report, Los Alamos National Laboratory Report LA-12905-SR, 125p.

Bolivar, S., P. Gillespie, M. Clevenger, and J. Day, 1994, The Transition to a Revised Quality Assurance Standard: the Los Alamos Experience, 21st Annual National Energy and Environmental Quality Division Conference Proceedings, Tucson, AZ, Session 4B, 10p.

Day, J., P. Gillespie, and S. Bolivar, 1994, The Quality Council in the Scientific Arena, 48th Annual Quality Congress Conference Proceedings, May 24-26, Las Vegas, NV, pp. 87-92.

Environmental Safety Services, 1994 (Feb.), BabyTrex Database Utilities, 83p.

Environmental Safety Services, 1994 (Sept.), BabyTrex Data Bases and Code Validation, 13p plus two inclusive appendixes.

LATA, 1994a (C. Chavez, compiler), Orientation to the Los Alamos National Laboratory Yucca Mountain Site Characterization Project, Instructor's Guide, R5 (7 modules).

LATA, 1994b (C. Chavez, compiler), Orientation to the Los Alamos National Laboratory Yucca Mountain Site Characterization Project, Participant's Guide, R5 (7 modules plus attachments).

LATA, 1994c, TREX Training Records Data Base User's Manual (November 14, 1994; not paginated).

Reese, L. (Team Leader), 1994, Los Alamos National Laboratory Yucca Mountain Site Characterization Project Quality Assurance Management Assessment #94-21 Report (dated November 30, 1994), 6p.

US Department of Energy Office of Civilian Radioactive Waste Management, 1994, Office of Quality Assurance Annual Evaluation of OCRWM and Other Affected Organizations Quality Assurance Programs FY-1994, Informal Report dated 1-5-95, 29p.

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Appendix A

Q Team Charter

Q TEAM CHARTER

Attendees: The Q meeting is open to any Laboratory employee (including contractors) who work on the Yucca Mountain Site Characterization Project. Representatives of the following groups are considered charter members and normally attend every meeting:

Project Office Liaison
Verification
Records
Document Control
Management (QAPL)
Training
Site Research (QALs)
Corrective Action Reports (CARs)
Measuring and Test Equipment (M&TE)
Test Coordination Office (TCO)
Software Quality Assurance

Meetings: Meetings are held on a quarterly basis (four per year). May be supplemented by short (1-2) hour meetings as needed.

Format: The Quality Assurance Project Leader convenes and presides over the meetings. The agenda is determined by the members.

Vision: To be recognized by the YMP and Los Alamos National Laboratory as a proactive participant for meeting YMP requirements.

Mission: To foster team building, and to promote communication between all entities of the YMP; to facilitate continuous improvement by identifying issues, providing advice and planning and resolving such issues when possible, in order to meet requirements in a timely manner.

Appendix B

Training Classes in 1994

Appendix B

Table B-1. Formal Training Classes Offered in 1994. Several classes which were hosted by Los Alamos, but taught by the DOE or M&O, are not listed.

Class	Date	Attendees
Orientation	1-26-94	13
Records Management	1-27-94 3-10-94 4-19-94 4-25-94 5-17-94 6-16-94 7-28-94	15 14 4 10 13 9 3
Auditor Training	2-95 6-95	4 2

Appendix C

Controlled Documents Issued in 1994

1994 Controlled Documents

Detailed Procedures

ADDED	
LANL-LS2-DP-403, R0	Preparation and Purification of Siderophore
LANL-LS2-DP-404, R0	Procedure for the Determination of Microbial Enhanced Colloidal Agglomeration
LANL-LS2-DP-405, R0	ESF Sample Collection for Microbial Analyses
LANL-CST-DP-99, R0	Collection of Bulk Well and Spring Water Samples
LANL-CST-DP-100, R0	Sorption and Desorption Determinations by a Batch Sample Technique within the Controlled Atmosphere of a Glovebox for the Dynamic Transport Task
LANL-EES-5-DP-701, R0	Light Detection and Ranging (LIDAR) Operations

DELETED	
TWS-INC-DP-05, R2	Sorption, Desorption Ratio Determination of Geologic Materials by a Batch Method
TWS-INC-DP-62, R2	Bulk NTS Well Water Samples
TWS-INC-DP-83, R1	Storage and Handling of Solid Samples
LANL-EES-DP-07, R4	Cameca MBX Electron Microprobe Operating Procedure

SUPERSEDED	
LANL-INC-DP-35, R2 by LANL-CST-DP-35, R3	pH Measurement
LANL-CST-60, R3 by LANL-CST-DP-60, R4	Preparation of NTS Samples for LANL YMP Solid Core Experiments
LANL-INC-DP-63, R3 by LANL-CST-DP-63, R4	Preparation of NTS Core Samples for Crushed Rock Experiments Preparation of Core Samples for Crushed Rock Experiments
LANL-CST-DP-66, R1 by LANL-CST-DP-66, R2	Saturated Diffusion Cell Experiment
TWS-INC-DP-67, R0 by LANL-CST-DP-67, R1	Rock Beaker Experiment

LANL-CST-DP-86, R0 by LANL-CST-DP-86, R1	Sorption and Desorption Determinations by a Batch Sample Technique for the Dynamic Transport Task
LANL-CST-DP-87, R2 by LANL-CST-DP-103, R0	Identification, Storage, & Handling of Samples at HydroGeoChem Identification, Storage, & Handling of Samples for the Water Movement Test
LANL-INC-DP-094, R0 by LANL-CST-DP-094, R1 by LANL-CST-DP-094, R2	Using Ion Chromatography to Determine Chloride and Bromide Concentrations
TWS-EES-DP-03, R3 by LANL-EES-DP-03, R4	Petrography Procedure
LANL-EES-DP-111, R3 by LANL-EES-DP-111, R4	Rigaku 3064 X-Ray Fluorescence Spectrometer Operating System
LANL-EES-DP-115, R2 by LANL-EES-DP-115, R3	Vaisala HMI-32 Humidity Probe Procedure Vaisala HMI-36 Humidity Probe Procedure

1994
Controlled Documents

Quality Procedures

DELETED	
QAPP, R5	Quality Assurance Program Plan
LANL-YMP-SQAP, R0	Software Quality Assurance Plan
TWS-QAS-02.3, R1	Procedure for Readiness Review
LANL-YMP-QP-02.9, R1	Personnel Proficiency Evaluations
TWS-QAS-QP-03.7, R0	Procedure for Peer Review
TWS-QAS-QP-03.18, R0	Creation, Management, and Use of Computational Data
TWS-QAS-QP-03.22, R0	Verification and Validation of Software and Computational Data
TWS-QAS-QP-13.1, R2	Procedure for Handling, Storage, and Shipping Equipment
TWS-QAS-QP-15.2, R1	Deficiency Reporting

SUPERSEDED	
LANL-YMP-QP-01.2, R1 by LANL-YMP-QP-01.2, R2	Stop Work Control
LANL-YMP-QP-01.3, R1 by LANL-YMP-QP-01.3, R2 by LANL-YMP-QP-01.3, R3	Conflict Resolution
LANL-YMP-QP-01.4, R0 by LANL-YMP-QP-01.4, R1 by LANL-YMP-QP-01.4, R2	The Los Alamos YMP Organization and Quality Program Description
LANL-YMP-QP-02.4, R1 by LANL-YMP-QP-02.4, R2	Management Assessrnent
LANL-YMP-QP-02.5, R1 by LANL-YMP-QP-02.5, R2 by LANL-YMP-QP-02.5, R3	Selection of Personnel
LANL-YMP-QP-02.7, R1 by LANL-YMP-QP-02.7, R2 by LANL-YMP-QP-02.7, R3	Personnel Training

LANL-YMP-QP-02.11, R1 by LANL-YMP-QP-02.11, R2 by LANL-YMP-QP-02.11, R3	Personnel Orientation
LANL-YMP-QP-02.12, R0 by LANL-YMP-QP-02.12, R1	Exemption Control
LANL-YMP-QP-02.15, R0 by LANL-YMP-QP-02.15, R1	Requirements Tracebility
LANL-YMP-QP-03.5, R1 by LANL-YMP-QP-03.5, R2 by LANL-YMP-QP-03.5, R3 by LANL-YMP-QP-03.5, R4	Documenting Scientific Investigations
TWS-QAS-QP-03.17, R0 by LANL-YMP-QP-03.26, R0 by LANL-YMP-QP-03.26, R1	Review of Software and Computational Data Reviews of Software
TWS-QAS-QP-03.19, R0 by LANL-YMP-QP-03.27, R0 by LANL-YMP-QP-03.27, R1	Documentation of Software and Computational Data Documentation of Software
TWS-QAS-QP-03.2D, R0 by	Software Configuration Management

LANL-YMP-QP-03.20, R1 by LANL-YMP-QP-03.20, R2	
TWS-QAS-QP-03.21, R0 by LANL-YMP-QP-03.21, R1 by LANL-YMP-QP-03.21, R2 by LANL-YMP-QP-0321, R3	Software Life Cycle
TWS-QAS-QP-03.23, R0 by LANL-YMP-QP-03.23, R1 by LANL-YMP-QP-03.23, R2	Preparation and Review of Technical Information Products and Study Plans

TWS-QAS-QP-03.24, R0 by LANL-YMP-QP-03.24, R1	Submittal of Design and Test-Related Information
LANL-YMP-QP-03.25, R0 by LANL-YMP-QP-03.25 R1	Review of Design and Test Related Information
LANL-YMP-QP-03.26 R0 by LANL-YMP-QP-03.26, R1	Reviews of Software
LANL-YMP-QP-03.27, R0 by LANL-YMP-QP-03.27, R1	Documentation of Software
LANL-YMP-QP-04.4, R1 by LANL-YMP-QP-04.6, R0	Procurement of Commercial-Grade Items and Services Procurement
LANL-YMP-QP-04.5, R2 by LANL-YMP-QP-04.6, R0	Procurement of Non-Commercial-Grade Items and Services Procurement
LANL-YMP-QP-04.6, R0 by LANL-YMP-QP-04.6, R1	Procurement
LANL-YMP-QP-06.1, R5 by LANL-YMP-QP-06.1, R6 by LANL-YMP-QP-06.1, R7	Document Control
LANL-YMP-QP-06.2, R1 by LANL-YMP-QP-06.2, R2	Preparation, Review, and Approval of Quality Administrative Procedures

by LANL-YMP-QP-06.2, R3	
LANL-YMP-QP-06.3, R0 by LANL-YMP-QP-06.3, R1 by LANL-YMP-QP-06.3, R2 by LANL-YMP-QP-06.3, R3	Preparatio4 Review, and Approval of Detailed Administrative Procedures
LANL-YMP-QP-08.1, R2 by LANL-YMP-QP-08.1, R3 by LANL-YMP-QP-08.1, R4	Identification and Control of Samples
LANL-YMP-QP-08.3, R0 by LANL-YMP-QP-08.3, R1 by LANL-YMP-QP-08.3, R2	Transfer of Data

LANL-YMP-QP-12.1, R6 by LANL-YMP-QP-12.3. R0 by LANL-YMP-QP-12.3, R1	Control of Measuring and Test Equipment Control of Measuring and Test Equipment and Standards
LANL-YMP-QP-16.2, R2 by LANL-YMP-QP-16.2, R3	Trending
LANL-YMP-QP-16.3, R1 by LANL-YMP-QP-16.4, R0 by LANL-YMP-QP-16.4, R1	Deficiency Reports Corrective Action Reports
LANL-YMP-QP-17.4, R0 by LANL-YMP-QP-17.6., R0	Records Preparation Records Management
LANL-YMP-QP-17.5, R0 by LANL-YMP-QP-17.6, R0	Records Processing Records Management
LANL-YMP-QP-17.6, R0 by LANL-YMP-QP-17.6, R1	Records Management
LANL-YMP-QP-18.1, R4 by LANL-YMP-QP-18.1, R5 by LANL-YMP-QP-18.1, R6	Audits
LANL-YMP-QP-18.2, R2 by LANL-YMP-QP-18.2, R3	Surveys

by LANL-YMP-QP-18.2, R4	
LANL-YMP-QP-18.3, R2 by LANL-YMP-QP-18.4, R0	Auditor Qualification and Certification Auditor Qualification and Lead Auditor Certification

Appendix D

Los Alamos Deficiency Data Base

Appendix D. Los Alamos Deficiency Data Base

Introduction

In the following pages, deficiencies are categorized by implementation document, which is listed at the top of each page. Deficiencies are also grouped by year. Deficiencies are identified by the abbreviations listed below.

Deficiencies are compiled from Project Office and internal audit and survey reports, stop work order and conflict resolution logs, and the Los Alamos deficiency report data base. Deficiencies resolved during audits and surveys are included (identified in the FIXED column).

Abbreviations

SDR-562	Standard Deficiency Report 562, issued by Project Office.
YM-CAR-94-011	Corrective Action Report 011, issued by Project Office. 94 is the fiscal year (1994) deficiency was written
DR 135, R5, 18.2.7	Los Alamos Internal Deficiency Report #135. R5 is version of procedure; 18.2.7 is section of procedure violated.
CAR-94-05	Los Alamos Corrective Action Report 05; 94 (1994) is the year deficiency was issued.
91-008-1	Los Alamos internal audit 91-008, conducted in 1991. Deficiency #1 was fixed during the audit.
AR-94-07-02	Los Alamos internal audit 94-07, conducted in 1994. Deficiency #2 was fixed during the audit
YA-90-01-07	Project Office audit 90-01, conducted in 1990. Deficiency #7 was fixed during the audit.
SR-91-014	Project Office Survey 91-014, conducted in 1991. Deficiency #14 was fixed during the survey.
SWO-LA07	Los Alamos stop work order #07.
CR-001	Los Alamos conflict resolution #01.

Table D-I. QP-01.2 (Stop Work).

	Total
1990 Issued deficiencies - See Bolivar, 1995 Other deficiencies - See Bolivar, 1995	3 1
1991 No deficiencies	0
1992 No deficiencies	0
1993 No deficiencies	0
1994 Baseline to QARD, R0 No deficiencies	0

Table D-II. QP-01.3 (Conflict Resolution).

	Total
1990 No deficiencies	0
1991 No deficiencies	0
1992 No deficiencies	0
1993 No deficiencies	0
1994 Baseline to QARD, R0 No deficiencies	0

Table D-III. QP-01.4 (Organization and Quality Program Description).

	Procedure initiated in 1994	Total
1994	Baseline to QARD, RO	
	Issued deficiencies - CAR 246, Rl, Att 1, c.	1
	Other deficiencies - YA-94-08-04, R1	1

Table D-IV. QP-02.4 (Management Assessment).

		Total
1990	Issued deficiencies - See Bolivar, 1995	1
1991	No deficiencies	0
1992	No deficiencies	0
1993	No deficiencies	0
1994	Baseline to QARD, R0	0
	No deficiencies	

Table D-V. QP-02.5 (Selection of Personnel).

		Total
1990		
	Issued deficiencies - See Bolivar, 1995	5
1991		
	Issued deficiencies - See Bolivar, 1995	5
	Other deficiencies - See Bolivar, 1995	7
1992		
	Other deficiencies - See Bolivar, 1995	5
1993		
	Issued deficiencies - DR-227, R1, 6.1.1 DR 229, R1, 6.2.3 DR 231, R1, 6.2.3	3
	Other deficiencies - 93-09-1, R1, 6.1.2 93-10-1, R1, 6.1.1, 6.1.2 93-12-1, R1, 6.1.2	3
1994		
	Baseline to QARD, R0	
	Issued deficiencies - CAR 246, R3, 9.0, 9.1	1
	Other deficiencies - SR-94-09-01, R1, 6.1.2 SR-94-07-01, R2, 6.3.1	2

Table D-VI. QP-02.7 (Training).

		Total
1990		
	Issued deficiencies - See Bolivar, 1995	13
1991		
	Issued deficiencies - See Bolivar, 1995	3
	Other deficiencies - See Bolivar, 1995	2
1992		
	Issued deficiencies - See Bolivar, 1995	5
	Other deficiencies - See Bolivar, 1995	6
1993		
	Issued deficiencies - DR 219, R1, 6.2 DR 221, R1, 6.2 DR 214, R1, 9.0 DR 213, R1, 6.2	4
	Other deficiencies - 93-05-1, R1, 6.2 93-10-2, R1, 6.2	2
1994		
	Baseline to QARD, R0	
	Issued deficiencies - CAR 246, R3, 9.0, 9.1	1
	Other deficiencies - AR-94-04-01, R3, 6.1 SR-94-10-01, R2, 6.1.1 SR-94-11-01, 02, R2	4

Table D-VII. QP-02.11 (Orientation).

		Total
1990		
	Issued deficiencies - See Bolivar, 1995	6
1991		
	Issued deficiencies - See Bolivar, 1995	1
	Other deficiencies - See Bolivar, 1995	2
1992		
	Other deficiencies - See Bolivar, 1995	2
1993		
	Other deficiencies - 93-07-2, R1, 6.2.4 93-09-2, R1, 6.1.1 93-10-3, R1, 6.1.2	3
1994		
	Baseline to QARD, R0	
	Issued deficiencies - CAR 246, R3, 9.0, 9.1	1

Table D-VIII. QP-02.12 (Exemption Control).

	Procedure initiated in 1994	Total
1994		
	Baseline to QARD, R0	
	No deficiencies	0

Table D-IX. QP-02.15 (Requirements Traceability).

	Procedure initiated in 1994	Total
1994		
	Baseline to QARD, R0	
	No deficiencies	0

Table D-X. QP-03.5 (Scientific Investigations).

		Total
1990		
Issued deficiencies	- See Bolivar, 1995	15
1991		
Issued deficiencies	- See Bolivar, 1995	14
Other deficiencies	- See Bolivar, 1995	13
1992		
Issued deficiencies	- See Bolivar, 1995	2
Other deficiencies	- See Bolivar, 1995	8
1993		
Issued deficiencies	- DR 220, R1, 6.5.3	1
Other deficiencies	- 93-04-1, R1, 6.4 93-06-1, R1, 6.5.3.1 93-12-2, R1, 6.2-.4	3
1994		
Baseline to QARD, R0		
Issued deficiencies	- CAR 234, R2, 6.4.4 CAR 235, R1, 6,6,1 CAR 236, R1 CAR 237, R1 CAR 238, R1, 6.5.3.1 CAR 243, R2, 6.4.5 CAR 251, R2 YM-CAR-94-081, R2, 6.6.1	8
Other deficiencies	- YA-94-08-07, R2, R3, 6.4.4.1, 6.1.5.1 AR-94-04-04, R0, 6.6.3 AR-94-05-01(4), R2, 6.4.6.1 AR-94-13-08, R3, 6.4.5 AR-94-14-01(6), R3, 6.1.5 SR-94-09-02(5), R1, 6.4.6	18

Table D-XI. QP-3.20 (Software Configuration Management).

	Procedure initiated in 1991	Total
1992	Issued deficiencies - See Bolivar, 1995	6
1993	Issued deficiencies - DR 222, R0, 6.0	1
1994	Baseline to QARD, R0 No deficiencies	0

Table D-XII. QP-03.21 (Software Life Cycle).

	Procedure initiated in 1991	Total
1992	Issued deficiencies - See Bolivar, 1995	5
	Other deficiencies - See Bolivar, 1995	1
1993	Issued deficiencies - DR 222, R0, 6.0	1
1994	Baseline to QARD, R0 No deficiencies	0

Table D-XIII. QP-03.23 (TIPs and Study Plans).

		Total
1990		
	Issued deficiencies - See Bolivar, 1995	14
	Other deficiencies - See Bolivar, 1995	3
1991		
	Issued deficiencies - See Bolivar, 1995	8
1992		
	Issued deficiencies - See Bolivar, 1995	3
	Other deficiencies - See Bolivar, 1995	1
1993		
	Other deficiencies - DR 222, R0, 7.0	1
1994		
	Baseline to QARD, R0	
	Issued deficiencies - CAR 239, R1, 6.1, 6.2	1
	Other deficiencies - SR-94-09-07, R1, 6.1.3	1

Table D-XIV. QP-03.24 (Submittal of Design and Test Information).

		Total
1990		
	No deficiencies	0
1991		
	No deficiencies	0
1992		
	No deficiencies	0
1993		
	No deficiencies	0
1994		
	Baseline to QARD, R0	
	No deficiencies	0

Table D-XV. QP-03.25 (Review of Design and Test Information).

	Total
1990 No deficiencies	0
1991 No deficiencies	0
1992 No deficiencies	0
1993 Other deficiencies - 93-01-1, R0, 6.3.3, 7.1.1	1
1994 Baseline to QARD, R0 No deficiencies	0

Table D-XVI. QP-03.26 (Software Reviews).

	Total
1990 No deficiencies	0
1991 No deficiencies	0
1992 Issued deficiencies - See Bolivar, 1995	6
1993 Issued deficiencies - DR 222, QP-03.17, R0, 6.0 Other deficiencies - 93-01-1, R0, 6.3.3, 7.1.1	1 1
1994 Baseline to QARD, R0 Issued deficiencies - YM-CAR-94-082, R1, 6.1.2.1.6	1

Table D-XVII. QP-03.27 (Software Documentation).

		Total
1990	No deficiencies	0
1991	No deficiencies	0
1992	Issued deficiencies - See Bolivar, 1995	4
1993	Other deficiencies - 93-01-1, R0, 6.3.3, 7.1.1	1
1994	Baseline to QARD, R0	
	No deficiencies	0

Table D-XVIII. QP-04.6 (Procurement).

		Total
1990	Issued deficiencies - See Bolivar, 1995	25
	Other deficiencies - See Bolivar, 1995	3
1991	Issued deficiencies - See Bolivar, 1995	11
	Other deficiencies See Bolivar, 1995	1
1992	Other deficiencies - See Bolivar, 1995	1
1993	Issued deficiencies - DR 224, QP-04.5, R2, 6.3	1
	Other deficiencies - 93-12-4, QP-04.4, R1, 6.2, 6.7 93-09-3, QP-04.4, R1, 6.5.1 93-10-4, QP-04.4, R1, 6.3, 6.5.1	3
1994	Baseline to QARD, RO	
	Issued deficiencies - CAR 241, R2, 6.2.2, 6.3 CAR 247 CAR 248 CAR 249 YM-CAR-94-080, R1	5
	Other deficiencies - SR-94-04-01, R0, 6.3.5.2	1

Table D-XIX. QP-06.1 (Document Control).

		Total
1990		
	Issued deficiencies - See Bolivar, 1995	8
1991		
	Issued deficiencies - See Bolivar, 1995	4
	Other deficiencies - See Bolivar, 1995	2
1992		
	Issued deficiencies - See Bolivar, 1995	1
	Other deficiencies - See Bolivar, 1995	1
1993		
	Issued deficiencies - DR 232, R5, 6.1.1	1
	Other deficiencies - 93-12-5, R5, 6.3 93-09-4, R5, 9.0	2
1994		
	Baseline to QARD, RO	
	No deficiencies	0

Table D-XX. QP-06.2 (Quality Administrative Procedures).

		Total
1990		
	Issued deficiencies - See Bolivar, 1995	5
1991		
	No deficiencies	0
1992		
	Issued deficiencies - See Bolivar, 1995	5
1993		
	Issued deficiencies - DR 217, R1, 6.2.2 DR 226, R0, 6.1.1	2
1994		
	Baseline to QARD, R0	
	Issued deficiencies - CAR 245, R3, 9.1	1
	Other deficiencies - AR-94-04-03, R1, 6.1.1.3 SR-94-13-01(9)	10

Table D-XXI. QP-06.3 (Detailed Technical Procedures).

		Total
1990	Issued deficiencies - See Bolivar, 1995	3
1991	Issued deficiencies - See Bolivar, 1995	3
1992	Issued deficiencies - See Bolivar, 1995	2
1993	Issued deficiencies - DR 221, R0, 9.1	2
	Other deficiencies - 93-02-2, R0, 6.2	
1994	Baseline to QARD, R0	
	Issued deficiencies - CAR 245, R2, 9.1	1
	Other deficiencies - SR-94-13-01(21), R0	21

Table D-XXII. QP-08.1 (Samples).

		Total
1990	Issued deficiencies - See Bolivar, 1995	3
1991	Issued deficiencies - See Bolivar, 1995	1
1992	Other deficiencies - See Bolivar, 1995	2
1993	No deficiencies	0
1994	Baseline to QARD, R0	
	Issued deficiencies - CAR-244, R3, 6.5.3 CAR-250, R3	2
	Other deficiencies - YA-94-08-03, R4, 6.1.1.1	1

Table D-XXIII. QP-08.3 (Data).

1990		Total
	No deficiencies	0
1991		
	Issued deficiencies - See Bolivar, 1995	2
1992		
	No deficiencies	0
1993		
	Issued deficiencies - DR 225, R0, 6.1.2, 6.2.1	1
1994		
	Baseline to QARD, R0	
	Issued deficiencies - CAR 240, R2, 6.4.5 YM-CAR-94-083	2
	Other deficiencies - AR-94-05-08, R3	1

Table D-XXIV. QP-12.3 (M&TE).

1990		Total
	Issued deficiencies - See Bolivar, 1995	15
	Other deficiencies - See Bolivar, 1995	1
1991		
	Issued deficiencies - See Bolivar, 1995	9
	Other deficiencies - See Bolivar, 1995	3
1992		
	Issued deficiencies - See Bolivar, 1995	4
	Other deficiencies - See Bolivar, 1995	2
1993		
	Issued deficiencies - DR 216, QP-12.1, R6, 9.0 DR 228, QP-12.1, R6, 6.4	2
	Other deficiencies - 93-04-4, QP-12.1, R6, 6.2 93-09-05, QP-12.1, R6, 6.4.3.2	2
1994		
	Baseline to QARD, R0	
	Issued deficiencies - CAR 233, R0 CAR 242, R1, 6.6, 6.7	2
	Other deficiencies - YA-94-08-01, R1, 6.6.2 YA-94-08-02, R1, 6.3.2 AR-94-05-05-07 (3), R1, 6.6.2.9, 6.5.6	5

Table D-XXV. QP-16.2 (Trending).

		Total
1990	Issued deficiencies - See Bolivar, 1995	3
1991	No deficiencies	0
1992	No deficiencies	0
1993	No deficiencies	0
1994	Baseline to QARD, R0 No deficiencies	0

Table D-XXVI. QP-16.4 (Corrective Action Reports).

		Total
1990	Issued deficiencies - See Bolivar, 1995	3
	Other deficiencies - See Bolivar, 1995	1
1991	Issued deficiencies - See Bolivar, 1995	2
	Other deficiencies - See Bolivar, 1995	2
1992	No deficiencies	0
1993	No deficiencies	0
1994	Baseline to QARD, R0 No deficiencies	0

Table D-XXVII. QP-17.6 (Records).

		Total
1990		
	Issued deficiencies - See Bolivar, 1995	18
	Other deficiencies - See Bolivar, 1995	3
1991		
	Issued deficiencies - See Bolivar, 1995	13
	Other deficiencies - See Bolivar, 1995	4
1992		
	Issued deficiencies - See Bolivar, 1995	4
	Other deficiencies - See Bolivar, 1995	3
1993		
	Issued deficiencies - DR 216, QP-17.4, R0, 9.0 DR 223, QP-17.4, R0, 6.1, 6.3 DR 218, QP-17.5, R0, 6.1.2	3
	Other deficiencies - 93-02-1, QP-17.4, R0 93-06-2, QP-17.4, R0, 6.3.5 93-09-6, QP-17.4, R0, 6.3.5 93-12-6, QP-17.4, R0, 6.4.1	4
1994		
	Baseline to QARD, R0	
	Issued deficiencies - YM-CAR-94-078	1
	Other deficiencies - SR-94-01-01, R0, Att.2	1

Table D-XXVIII. QP-18.1 (Audits).

		Total
1990		
	Other deficiencies - See Bolivar, 1995	1
1991		
	Issued deficiencies - See Bolivar, 1995	2
1992		
	No deficiencies	0
1993		
	No deficiencies	0
1994		
	Baseline to QARD, R0	
	Other deficiencies - YA-94-08-05, R6, 6.1.3.4	1

Table D-XXIX. QP-18.2 (Surveys).

		Total
1990	Other deficiencies - See Bolivar, 1995	1
1991	Issued deficiencies - See Bolivar, 1995	1
	Other deficiencies - See Bolivar, 1995	2
1992	Issued deficiencies - See Bolivar, 1995	1
1993	No deficiencies	0
1994	Baseline to QARD, R0	
	No deficiencies	0

Table D-XXX. QP-18.4 (Auditor Certifications).

		Total
1990	Other deficiencies - See Bolivar, 1995	1
1991	Other deficiencies - See Bolivar, 1995	1
1992	Other deficiencies - See Bolivar, 1995	1
1993	No deficiencies	0
1994	Baseline to QARD, R0	
	No deficiencies	0

Table D-XXXI. DPs (Detailed Technical Procedures).

		Total
1990		
Other deficiencies -	YA-90-01-12, DP 07, R3	1
1991		
Issued deficiencies -	DR 140, DP 06 DR 160, DP 35 DR 174, DP 607, R0 DR 178, DP 401, R0 DR 187, DP 35, R0	5
Other deficiencies -	91-02-3, DP 606, R1 91-08-4, DP 15 91-10-2, DP 607, R0, 6.6	3
1992		
Issued deficiencies -	DR 199, DP 607, R0, 2.0, 4.0 DR 201, DP 608, R0 DR 206, DP 87, R1 DR 206, DP 90, R0 DR 206, DP 87, R2 DR 206, DP 96, R0 DR 206, DP 95, R0 DR 206, DP 90, R1	8
1993		
Issued deficiencies -	DR 219, DP 101, R2, 9.0 DR 232, DP 79, R1	2
Other deficiencies -	93-04-4, DP 606, R2 93-04-2, DP 607, R0, 6.1 93-12-3, DP 86, R0	3
1994		
Baseline to QARD, R0		
Issued deficiencies -	YM-CAR-94-079, DP 35, R2, 6.2.2	1
Other deficiencies -	AR-94-04-02, DP 110, R2 AR-94-13-01(7), DP 94, R1, 6.5.4.3, 6.2.4.1 SR-94-13-01(21), Various DPs AR-94-04-01, DP 25, R4	30

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