

*Los Alamos National Laboratory
Yucca Mountain Site Characterization Project
1995 Quality Program Status Report*

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Stephen L. Bolivar

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**LOS ALAMOS NATIONAL LABORATORY
YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT
1995 QUALITY PROGRAM STATUS REPORT**

by

Stephen L. Bolivar

ABSTRACT

This status report summarizes the activities and accomplishments of the Los Alamos National Laboratory Yucca Mountain Site Characterization Project's (YMP's) quality assurance program for January 1 to September 30, 1995. 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 as the "Q Team." In 1995, this team selected nine core values, established vision and mission statements, and as a result of a self-assessment, modified a goal/performance process to be more responsive to programmatic goals. The team also coordinated a myriad of program activities designed to improve existing processes or solve current problems. One of these activities involved putting all quality administrative procedures (QPs) and their forms onto a local area network. This data base is now accessible by YMP personnel. In the future, these documents will be placed on the Internet, making universal access possible. Another process improvement involved setting up a "linked" data base for all distribution lists. In essence, this allows one to make a change to the data base, and all corresponding distribution lists automatically change. The most time-consuming activities were the revision of procedures in response to the revision of the Quality Assurance Requirements and Description (the primary regulatory document), the transition of the internal audit function and the deficiency report tracking functions to DOE, and the transition of the Laboratory to the YMP management and operations (M&O) team. Although some of the revisions only required minor changes, twenty procedures were revised by the deadline of July 31, 1995. The biggest process change involved condensing five software documents into two procedures, reducing nineteen forms to six, and eliminating 40% of the original text. Thirty QPs were reduced to twenty-three documents. Lastly, records personnel submitted several hundred record packages to the project's records repository, with a rejection rate of only 0.0014 %.

Personnel from the Project Office conducted two audits of Los Alamos activities. No corrective action reports (CARs) were issued. Before transferring the internal audit function to DOE, Los Alamos verification personnel completed the FY95 audit and surveillance schedule, conducting six audits and five surveys. This resulted in five minor deficiencies, although no major problems were identified. An independent management survey revealed high job satisfaction and morale. Individuals interviewed during the performance of audits and surveillances were knowledgeable about quality assurance requirements and responsive to auditor inquiries.

Trend reports for 1995 were examined and are summarized herein. Most Los Alamos groups have reduced the number of deficiencies issued in 1995 compared to those issued in 1994. One exception is that some subcontractors were recognized as having high numbers of deficiencies issued; this was recognized as an adverse trend which was closed when the subcontracts were terminated. For the last five years, the number of both external and internal deficiency reports issued to Los Alamos personnel has decreased. The Los Alamos YMP, as characterized in this report, is performing satisfactory work for the DOE. Los Alamos personnel are annually improving upon the processes used to meet quality assurance program requirements. Anticipated extensive budget cuts for FY96 will require that many processes be further streamlined.

1.0 INTRODUCTION

This status report is for January 1, 1995, to September 30, 1995. In the past, status reports have been written for a calendar year, but to allow for better comparisons to DOE activities, future status reports will be issued per fiscal year (i.e. October 1 to September 30). For this report, "1995" covers only the period of January 1 to September 30.

This report summarizes the fiscal year activities and accomplishments of the Los Alamos National Laboratory (Los Alamos or Laboratory) 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 evaluate improvements. This is the fourth status report (Bolivar, 1992; Bolivar, 1994; Bolivar, 1995; Bolivar, 1996). Because the Quality Assurance Requirements and Description (the document that contains all quality assurance requirements for the YMP) was revised last year and because budget shortfalls will severely affect program work in fiscal year 1996 (FY96), care should be taken when comparing activities in previous reports.

Quality issues are discussed at quality (Q) meetings. Because many personnel are now more knowledgeable about the YMP and quality issues than they were in 1991, and because 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 Q 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 discuss the status of current issues. Any YMP personnel may bring any quality issue before the meeting for discussion. Discussions are resolved at the Q meeting, or 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, and 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 from January 1 to September, 1995 are discussed. The goals for this period (Bolivar, 1995) are also listed, followed by a discussion of their status. Lastly, goals for FY96 are identified. The Trend Analysis section is a summary of 1995 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 auspices 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 (ACPL) 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), Ned Elkins, and the Test Coordination Office (TCO) comprising three Project Leaders, whom he leads; Site and Regulatory Investigations led by Gilles Bussod; Administration and Control, headed by Allyn Pratt; 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, 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. In June, Andy Gallegos assumed the duties as QAL of Division CST. This change was made to better distribute QAL duties. There has been a decrease of 1.5 QALs in the last four years even though the technical scope of work has greatly increased.

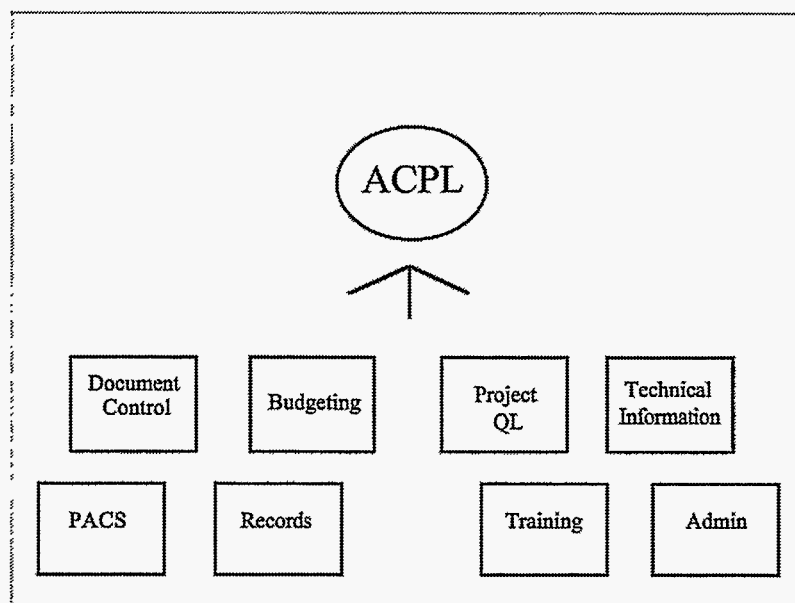
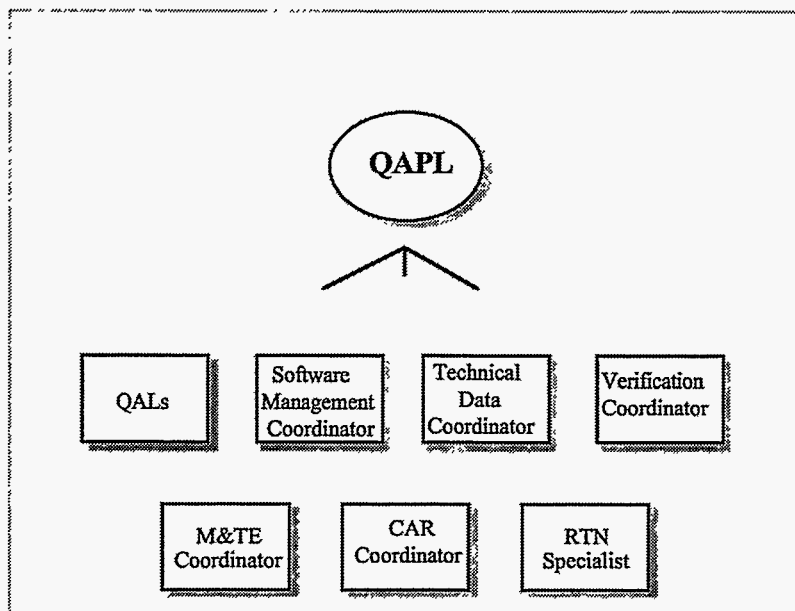


Fig. 1. Organizational Reporting Responsibilities (acronyms not previously defined: M&TE = measuring and test equipment; CAR = corrective action report; RTN = requirements traceability network; QL = quality liaison; PACS = Project accounting and control system; Admin = administration).

Training, Records, Project Control, and Document Control Coordinators report to the ACPL. Because the YMP requires dual storage of quality records, the Records Coordinator maintains a records processing center (RPC). These relationships are depicted in Fig. 1.

Personnel changes include the addition of Paul Gillespie as Verification Coordinator, and Lyle Wichman as the Deficiency Coordinator and also as the M&TE Coordinator. Gilles Bussod became the new Site and Regulatory Project Leader.

On September 30, 1995, 166 people were involved in the Los Alamos YMP, although not all were full time equivalents. Of these 166 people, 144 were involved in quality activities, i.e. activities governed by the Quality Assurance Requirements and Description document. Table II shows the Los Alamos YMP personnel categorized by Los Alamos group for 1995.

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), Golder Associates.
Mike Clevenger	Group EES-13; Deputy QAPL.
Andy Gallegos	CST Division; Subcontractors: Stanford University and Lawrence Berkeley Laboratory.
Lyle Wichman	Groups EES-1, EES-4, EES-5, EES-15, and LS-2; Deficiency Coordinator; M&TE Coordinator.

Table II. Laboratory Groups and YMP Personnel.

Groups	Q Activity	Non-Q Activity
Earth and Environmental Sciences (EES) Division	35	4
Program Management and Test Coordination Office	35	9
Chemical Science and Technology (CST) Division	28	2
Other Divisions	6	2
Contractors	40	5
Totals	144	22

2.0 PROGRAM ACTIVITIES

2.1 Program Development. Most program development activities are initiated and discussed in Q 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 Q meeting. In 1995 about 200 action items were addressed.

In 1991, about twenty-five Q meetings were held. In 1992, the frequency was reduced to about one per month. Since then, we have met about four times per year. These quarterly meetings were supplemented with smaller special process team meetings. For example, the QALs and QAPL met about once each month. The frequency of one Q 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 additional Q Team meetings (held approximately every third month) each of which is facilitated by a team member other than the QAPL. Topics are determined by the meeting facilitator. Usually some sort of social activity (such as an all green lunch on St. Patrick's Day) is supplemented by team-building activities. These meetings are excellent morale boosters.

The fourth Q meeting of 1995 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 when possible. Over the last three years, almost all members of the Q Team have visited the North Portal and various DOE and contractor support facilities, as well as having attended Las Vegas-based training classes. These activities greatly contribute to a better understanding of the YMP, and create better communication between various organizations.

In late 1994, the Deputy QAPL initiated several classes to promote human resource development. The first class covered the facilitation process. Two other classes helped the Q Team define core values. Lastly, two classes were devoted to establishing mission/vision statements. Ultimately, by early 1995, 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 and keep focused on the speaker. Approach a common solution.
4. Give opposing views equal consideration and 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 on a small card that can be worn with their badges. We then updated our team charter (Appendix A). The vision statement (Where do we want to be in the future?) and mission statement (How do we get there?) were also finalized at the first Q meeting. They are as follows:

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

The goal process, which was introduced in 1994, was modified. It seemed that although we identified goals for each individual, there was no common link to what the Q team wanted to accomplish. Therefore, Q Team goals were discussed and established at Q meetings. We ended up with three goals initially, which were later expanded to five goals. Individuals or processes were then given goals that directly related to the five main goals. We tried to quantify goals so that they could be easily identified when completed. Goals were updated periodically (every four to six months). We also tied the self-assessment goals to the Q Team goals, to end up with just one set of goals. This approach appeared to fit better with the work ethic—in other words, the new goals were actually part of an individuals' job requirements, rather than a special entity that some supervisor was constantly checking on. Individual goals thus related to the general goals of the Q Team.

Our Los Alamos program office established a local area network (LAN) last year, as did the TCO in Las Vegas. All members 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 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 Q meeting and drives many of our activities. The attempt to improve is one of the major reasons for implementing a LAN, making e-mail available to all personnel, and instituting electronic data bases when possible.

Successful social interactions of the Q Team members help to encourage better job performances. To encourage these interactions, different members of the Q team organize and lead selected Q Team meetings. These meetings included a St. Patrick's Day lunch where all food had to be green, a video on volcanic eruptions, and a personality determination based on birth dates. These meetings are an extremely good method for boosting morale and generating creativity.

The Ron Recognition Award was instituted in 1993 to recognize quality performances of Q Team members on a quarterly basis. In 1995 it was issued to Jim Young for his leadership in verifications for having reduced the amount of open deficiencies to less than ten; to Paul Gillespie for his work with the RTN matrix; and to Martin Herrera for completely revising the data submittal process. Each of these individuals in turn received the gold inlaid "Thank Q" stamp. The gift is rotated among recipients every quarter.

Most importantly, 1995 was a year of impending change. We were told by the DOE that we were to transfer our audit function to DOE by July 1, 1995. This included the deletion of our deficiency tracking system and the implementation of the DOE system. DOE would conduct vendor audits as needed. We were also to transition our Laboratory to the management and operations contractor (M&O) as a teammate. These tasks required developing and revising transition plans, performing budget planning exercises, and redefining selected work processes. Both transitions were completed by midyear, and both transitions resulted in a lot of issues that are addressed herein, as appropriate.

Part of the impending change had to do with potential budget cuts. Several budget exercises were run in midsummer for 20% and 30% shortfalls. We were notified just before October 1 (the beginning of the new fiscal year) that we might face an 80% cut. By mid-October, it looked as if the Los Alamos budget might settle at about a 50% cut. This will severely impact our support services, including quality assurance functions, which will face cuts of 50% to 60%. The early part of FY96 will be used to determine where these cuts will occur. Coupled with these changes, the Laboratory is facing a reduction in force (RIF). Consequently, personnel who may lose a programmatic position could have a difficult time finding a new position.

New protocol was required to interact with the M&O as FY96 approached. Several budget estimates were made and work scopes submitted. Initially, the M&O was contacting investigators directly. This caused some inconsistencies, and the TPO required that all changes

be channeled through her office. Because of budget uncertainties and political turmoil over the future of YMP in Congress, only limited funds were transferred to Los Alamos at the beginning of FY96. Unfortunately there were not adequate funds for contractor support, and it was necessary to furlough contract employees. Compounding the issue were several new or unplanned taxes on support personnel, which was not accounted for in initial FY95 planning. Consequently, at the beginning of FY96, most support functions are on hold. This probably will not initially have a negative impact on the Los Alamos quality program or associated activities, but if the delay persists, problems will arise. Hopefully the new budget, albeit reduced, will be implemented by November 1. The emphasis will then be to adapt to new strategies of trying to do more with less.

2.1.1. Self-Assessment.

The major focus of the initial Q meeting in 1995 was to conduct a self-assessment of last year's activities. The 1994 action item data base was examined to help determine the top accomplishments in 1994. The team selected the four most significant items. Brainstorming techniques were then used to identify major problems in the Los Alamos YMP that the Q Team experienced in 1994. These problems were then ranked and the top three identified. Lastly, five quantifiable goals for 1995 were identified. The results are summarized in Table III.

During the self-assessment, we also examined our progress with respect to 1994 goals (Bolívar, 1995). The self-assessment goals for last year were as follows:

1. Resolve internal conflicts/encourage team building. This will be measured by doing a survey. Presently, 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. Deficiencies for 1994 should decrease compared to 1993 totals.

There was unanimous agreement that we met our goal to reduce internal conflicts and encourage team building. The vision/mission statements were finalized early in 1995, and five classes on facilitation, core values, etc., were offered. Goal four was satisfied when QP-17.6 was revised and a primary record identifier established. This could allow us to retrieve our records at a 100% retrieval rate, however there still can be a problem with older records (or even the most recent records) that were not indexed correctly when they were entered into YMP record data bases. The last goal was partly met by interactions between the QALs and investigators, interactions between the auditors and investigators, and presentations by the QAPL at two "all-hands" meetings. However, the number of internal deficiencies increased slightly (compared to 1993). The majority of the deficiencies have to do with a lack of attention to detail. Most investigators comply with the regulations, but there is not a strong proactive attitude regarding fixing problems and improving processes. The QAPL has studied this problem and believes that an annual "refresher" orientation class should be provided in which program policies and regulations are reviewed. This class will be developed when the necessary funds become available. About 90% of the goals were met.

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

Issue Identification (Top 4 Issues—what most time was spent on)	<ol style="list-style-type: none"> 1. Revising all quality administrative procedures 2. Conducting 30 internal audits and surveys 3. Resolving Project Office deficiencies (i.e., CARs) 4. Developing the RTN process
Major Problems	<ol style="list-style-type: none"> 1. Developing an electronic training data base 2. Organizational chart updates were inconsistent 3. TCO and YMQAD conflicts over interpretations of requirements
Goals for 1995	<ol style="list-style-type: none"> 1. Create an electronic document system by 8-31-95. QPs, forms, audit schedules, and the organizational chart are to be available on the EES-13 network. 2. Transition the audit function to DOE by 7-1-95. This will require learning the new DOE deficiency system, revising QPs, etc. 3. Study and improve the organizational chart process by 12-31-95. A special process team will flow chart the process by 5-30-95. 4. Determine how we can emphasize employee responsibility. A special process team will come up with recommendations by 5-30-95. 5. Examine the QP process (in the mega sense). Consider the entire process. A special process team will flow chart the process and have recommendations by 6-30-95.

2.1.2 Issues.

- Issue 1.** To provide a greater variety of input for decisions, the QAPL formed a small (four people) Q management team. The individuals on this team are compatible and have very diverse backgrounds. They should be able to provide a variety of solutions for resolving the difficult programmatic issues that periodically arise.
- Issue 2.** The QAPL found that some monthly reports are still not always sent in on time. Fortunately, this is a minor problem. The QAPL modified the monthly reporting form to better reflect the needs of the DOE and now notifies personnel five days before the reports are due. This appears to have solved the problem.
- Issue 3.** One persistent problem is that whenever a procedure is revised, new forms (which are part of the new procedure) have to be distributed. This process isn't as smooth as it should be. To mitigate this problem, the Deputy QAPL developed a process to make these forms available on the LAN. By the end of FY95, most forms were available on the EES-13 LAN. Unfortunately, before it can be put on the LAN, each form has to be programmed and this is time consuming (and expensive). We are now looking at possible scanning methodologies to facilitate the input of forms (and procedures) onto the LAN.

- Issue 4. In an effort to use quality processes to improve distribution of memos, a distribution data base was created. The data base consists of subsets (e.g., principal investigators, management, project leaders, etc.) that are linked. Responsibility for maintaining this data base was given to one of the secretaries. Now, whenever there is a change in the data base, the appropriate distribution lists change correspondingly.
- Issue 5. The budget shortfall will create problems that will have to be addressed in FY96. Many support functions are handled by contractor employees. Several of these functions are run by only one individual. If that individual leaves, the function essentially stops. Although we have used cross-training in the past, we need to look at each function and have a contingency plan should the owner of the function be unable to continue.
- Issue 6. The deficiencies for each Laboratory group were examined, and it was found that one group and two subcontractors had high totals compared to the average. To help subcontractors be more aware of regulations and policies, the QALs agreed to visit subcontractor sites at least quarterly. One Los Alamos group was assigned a new QAL.
- Issue 7. A special process team was selected to examine ways to increase employee responsibility. Several suggestions (e.g., add some type of refresher training) were identified. However, a firm set of recommendations was not developed. If budgets allow, this effort will continue into FY96.
- Issue 8. One of the biggest problems has been the addition or deletion of people to the project. We simply do not have a very good handle on this process. A special process team, consisting of M. Clevenger, who handles the organization chart, and C. Chavez, the Training Coordinator, developed a process for verifying organization chart positions against position descriptions. They also recommended not including students on the chart who are in the YMP for less than three months. This appears to have lessened the immediate problem.

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 quality assurance management advisory team.
- Produce a relational data base for distribution lists.
- Hold four Q meetings, one of which will be in Las Vegas.

All members of the Q Team were electronically linked by the middle of 1995. The QAPL modified the monthly report form and now notifies personnel five days before the report is due. Vision/mission statements were completed in January, and a management advisory team was formed. The relational data base for distribution lists was developed, tested, and implemented. Six Q team meetings were held (three quarterly meetings and three team-led meetings). All goals were met or exceeded.

2.14 Goals for FY96.

- Establish a forms directory on our LAN.
- Cross-train personnel or develop desk procedures for support functions.
- Hold four Q meetings, one of which will be in Las Vegas.
- Reexamine ways to improve employee responsibility.

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.

The procedure revisions (Table IV) were the results of changes in responsibilities brought about by the transition of audit duties to DOE, and to a lesser extent, by the Laboratory making the transition to becoming a team member of the M&O. The changes generally did not introduce new requirements but rather transferred some responsibilities from the Laboratory to the DOE. Although many procedures were revised, most changes were relatively minor. Only the software (QPs-3.20 and 3.21) and data procedures (QP-08.3) were completely rewritten, and this was an effort to improve these processes rather than in response to transition changes. Much of the Q Team's and the quality assurance staff's time in 1995 was devoted to procedure revision activities.

There were also several revisions made as the result of DOE RTN reviews conducted as part of compliance audits. However, these changes were relatively minor and not a great inconvenience.

Table IV. Procedure Revision Status

Year	Procedure Type	Revised	New	Deleted	Total In Use at End of Year
1991	QP	10	11	4	38
1992	QP	13	7	7	36
1993	QP	29	10	8	37
1994	QP	28	0	0	30
1995	QP	19	1	6	23
1991	DP	17	4	2	96
1992	DP	13	16	18	94
1993	DP	7	3	2	95
1994	DP	11	5	4	96
1995	DP	5	8	22	82

2.2.1 Issues.

- Issue 1. The QAPL and Q Team try to avoid having to subject investigators to constant retraining to procedures. Consequently, to facilitate training, procedures are normally released in a block to facilitate training. However, in 1995 several procedures had to be revised as the result of either RTN review changes or changes necessitated by the transition of audits to the DOE. Investigators feel they are constantly having to train and retrain. Our efforts in 1995 to avoid continual procedure revisions were largely unsuccessful. With a revised QARD, scheduled to be released in the Fall of 1995, it appears that investigators will have to brace for yet another set of procedure revisions.
- Issue 2. The software process has been difficult for investigators to use. At one time there were over thirty forms, six procedures, and a guidebook. After discussions with DOE and consultations with the Software Advisory Group as to what they thought the process should involve, the Software Coordinator was tasked with the responsibility of revising the process. The procedures were revised somewhat in 1994, but much remained to be done. Over a several-month period in 1995, the software procedures were completely rewritten and the process was greatly simplified. Nineteen forms were reduced to six, and text was reduced by about 40%. Four procedures and a software quality assurance guidebook were condensed into two procedures. The upcoming year will determine how successful these efforts were.
- Issue 3. Over the last three years, the position of Data Coordinator has changed several times. The DOE has also modified their data submittal process. As a result, the Los Alamos data submittal process was not very efficient, the procedure contained inaccuracies, and investigators did not understand their duties. Subsequently, the data submittal procedure was entirely revised. The Data Coordinator worked very closely with the M&O and DOE counterparts to meet their needs and to meet the ever-changing set of requirements for submitting data. The Data Coordinator has tried to keep the requirements for investigators to a minimum. The new procedure appears to be working, as data submittals are periodically being released.
- Issue 4. Some procedures, including notebooks (QP-03.5), records (QP-017.6), and surveys (QP-018.2) were completely revised, but the changes incorporated simply reflect more efficient methods of doing business or slight modifications to better meet QARD requirements. In many cases requirements were relaxed. In general, changes to the majority of other procedures were editorial. One exception is that for procurement (QP-04.6), investigators are now required to obtain an independent technical review before the purchase request is released. This is no value added, for the person doing the procuring is the subject matter expert.
- Issue 5. It still takes a relatively long time to do a major revision of a procedure (Table V). However, most delays are conscious efforts because of conflicting priorities. If an editorial correction is immediately needed, a procedure can be revised in a matter of hours (Bolívar, 1995). If a major revision is immediately needed, the fastest turnaround would be about one month. However, most major revisions take several months because authors perform other duties while simultaneously revising the procedure. One of the goals of FY96 will be to examine the entire QP revision process and determine if it can be further streamlined. However, in FY96, the number of support staff will be decreased, which may cause delays in timely revisions.

Table V. Statistics for Revision of Procedures.

Year	Types of Revision	Time (major/minor)	Percent (of total) Procedures Revised
1989	4 major/0 minor	18 months	10%
1990	5 major/4 minor	18 months/11 months	22%
1991	13 major/4 minor	12 months/6 months	42%
1992	16 major/5 minor	5 months/2 months	53%
1993	23 major/15 minor	8.7 months/4.5 months	100%
1994	3 major/26 minor	8.0 months /1.9 months	77%
1995	8 major/12 minor	7.3 months/1.5 months	67%

- 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 World-Wide Web (WWW). In 1995, we were able to put most procedures on the EES-13 LAN. Some forms were also made available to QALs and investigators (in a beta test mode). In 1995, our goal is to transfer these documents to the WWW. However, we must resolve software inconsistencies (we currently use three separate software packages for text and forms). It is difficult to combine these various packages. We also need to find a faster or more efficient method of scanning documents. Presently, we have to combine graphic images (our cover page and several attachments are represented as graphical images) and text. The text scans relatively fast, but the graphics take a long time to transfer. We will have to make this process more efficient if it is to replace the current process. Lastly, if we do come up with a new process, we'll have to revise the controlled document procedure (QP-06.1). The eventual process will be to generate all forms and text under one software package and transfer procedure revisions to the WWW whereby investigators can access the documents. Eventually, electronic signatures may be used. Several parts of this process are now under development.
- Issue 7. The QAPL asked investigators to examine the number of DPs being controlled and to remove unwanted documents. This would simplify the controlled document distribution. About 20 DPs were removed from controlled distribution.
- Issue 8. Initially the DOE reviewed all RTN matrix changes as a procedure was revised. After the transfer of the audit function to DOE, they agreed to do the RTN reviews only during annual audits. This will greatly reduce the time it takes to release a revised procedure.
- Issue 9. A special process team was selected to examine the technical information product (TIP) process. This is a very lengthy and paper-intensive bureaucratic process. The team came up with several good suggestions that will be incorporated, if possible, when the procedure is next revised.

2.2.2 Goals for 1995.

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

The revision time for both major and minor revisions of procedures decreased in 1995. Selected QPs were revised to meet changes in the QARD and changes as the result of the transition of the audit function to DOE. All revisions were completed by 7-31-95, although some procedures were not released until the end of September. One QAL compiled a checklist for the notebook procedure and distributed the list to other QALs. All goals were met or exceeded.

2.2.3 Goals for FY96.

- Determine if the QP revision process can be made more efficient.
- Streamline the TIP process.
- Put the procedures and forms on the WWW and make them available to investigators.
- Revise QP-6.1 to allow for electronic access of controlled documents.

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. As a result of budget cuts projected for FY96, it will be necessary to obtain balance calibrations from a new source. In the past, we utilized a contractor who trained to our procedures and used our weight set, which is traceable to NIST. However, there probably will not be FY96 funding for this support. Thus, investigators will have to find new methods for obtaining balance calibrations. Using the Laboratory calibration group is a possibility, but they hesitate to get involved with our procedures and training. Negotiations are currently underway.
- Issue 2. As FY96 work begins, it appears that several activities may be closed down or put on hold. The M&TE for this equipment will have to be removed from the M&TE list or tagged as appropriate. It is not clear if we will have money to fund the M&TE Coordinator, who is responsible for coordinating these activities.
- Issue 3. It currently is easier to purchase a new certified weight set than to recalibrate an existing set. We need to examine this process and see if a remedy exists.

2.3.2 Goals for 1995.

- Reduce the M&TE bureaucracy and make the process more efficient.
- Refine the electronic data base for M&TE.

The M&TE Coordinator examined the M&TE notification process and streamlined it so that investigators are now notified when M&TE calibrations are due. The electronic data base was reprogrammed and simplified to some extent. The goals were accomplished, however the process can still be streamlined further.

2.3.3 Goals for FY96.

- Help investigators develop a new balance-calibration strategy.
- Examine all M&TE with respect to unfunded or terminated activities.
- Determine what needs to be done to recalibrate an existing weight set.

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 majority of training to our quality administrative procedures is by "read only". The majority of training to our detailed technical procedures is by formal or on-the-job training. Bolivar (1995) reports no correlation between records rejected, deficiencies, and number of classes taught. Consequently, we do not offer many formal training classes. However, our personnel do routinely attend classes taught in Las Vegas (e.g., field safety classes) and we do host classes at Los Alamos for DOE when requested (Table VI).

2.4.1 Issues.

- Issue 1. As a result of the transition to the M&O, it was initially suggested that our personnel train to M&O orientation procedures. It became apparent that this would represent a lot of duplication (most Los Alamos employees already had attended the Los Alamos YMP orientation class) and unwanted expense. It was agreed that it wouldn't be necessary to duplicate these efforts.
- Issue 2. The records management class was offered seven times in 1994. We had planned to offer it in 1995, but revisions to the Project's records procedure allowed us no opportunity to revise our class to reflect these changes. After examining the deficiencies issued in 1995, it appears that deficiencies associated with record issues have dramatically decreased when compared to deficiencies issued in 1994, and there is no obvious weakness that correlates to the Los Alamos records management process. Therefore, we decided to make this class available by request only.
- Issue 3. Because of budget cuts, we may not be able offer our YMP orientation class in FY96. As an alternative, QP-02.11 (orientation) should be revised to allow employees the option of attending either the M&O's orientation classes or the Los Alamos class.

Issue 4. The QAPL attended a class in Las Vegas on listening effectively. He found the class to be beneficial and asked the instructor if she could come to Los Alamos and provide it for at least sixteen people (which has been normal protocol). Unfortunately, the M&O couldn't amend their training schedule for FY95. Because there would also be a charge for travel it was decided to withdraw the request.

Table VI. Training in 1995.

Training	Attendees	Date
Leadership & Communication Classes Santa Fe, NM	S. Bolivar	1/ 9-10/95, 1/13/95
YMP Orientation Los Alamos, NM	30 YMP personnel	1/2/95
IRIS Training Las Vegas, NV	S. Martinez	3/8/95
Licensing Workshop Las Vegas, NV	S. Martinez C. Chavez	3/22/95
M&O Orientation Classes Las Vegas, NV	A. Burningham	8/12/95
Underground Safety Training (GUT) Los Alamos, NM	12 investigators	5/31/95
Tom Peters Seminar Albuquerque, NM	S. Bolivar M. Clevenger	5/22/95
Deficiency and Trending Coordinator Training Las Vegas, NV	M. Clevenger	6/21/95
AP 16.1 and AP 16.2 Training Las Vegas, NV	P. Gillespie, S. Bolivar, L. Wichman	6/23/95
Effective Listening Las Vegas, NV	S. Bolivar	7/795

Issue 5. As a result of some instructional training held at Los Alamos, several lessons learned were identified. First, do not accept advertised costs; negotiations may greatly reduce published prices. Second, do not rely on e-mail for responses. Third, transferring money is difficult and time consuming with the Laboratory bureaucracy. Fourth, if questionnaires are to be submitted before the class, fill out the forms completely and have a point of contact for the inevitable problems that arise.

2.4.2 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 of a follow-up course to the orientation class.

The electronic version of the training data base is providing acceptable information. Several minor problems were recognized and fixed in 1995, and there are no current problems. The records management class is offered upon request; there were no requests for it in 1995. When

last revisited, the orientation class, when last revised, was put into a digital format. This will facilitate revisions the next time this document is reviewed. The feasibility was discussed with several investigators at an "all-hands" meeting. Investigators do not favor more training, but agreed that we need a mechanism to transfer annual changes to them by methods other than memos. The QAPL decided to further examine this issue in FY96.

2.4.3 Goals for FY96.

- Revise QP-2.11 (orientation) to allow new personnel to take either the Los Alamos YMP orientation class or the M&O's orientation class.
- Offer the records management class (QP-17.6) by request only.
- Review the YMP orientation class and update it in a timely manner.
- Continue to examine the feasibility for a follow-up to the orientation class.

2.5 Software. Requests to accept or modify software packages are submitted by means of 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 and placed under configuration control. Four codes were certified, or are in the process of being certified, in 1995. These are TRACRN, GZSOLVE, FEHMN, and SORBEQ.

The Software Management Coordinator spent much of 1995 revising existing software procedures. He was able to reduce four procedures, nineteen forms, and a guidebook to two procedures and six forms. The process is much easier to follow now, but it remains to be determined if the process will be more efficient. This revision did reduce the number of codes we had to track and control from 181 to only 4. Consequently, we were able to phase out a technician assistant position in February. In 1994, two CCB meetings were held.

2.5.1 Issues.

- Issue 1. The QARD has been revised, and the new version will probably be released late in 1995. The requirements determining which codes have to be controlled have apparently changed, and the impact of these new requirements is not clear. Funding for software configuration management in FY96 will be severely reduced. This may affect our ability to control the above codes.
- Issue 2. Los Alamos investigators work with several software codes, but the top priority for FY96 will be to get the documentation for the FEHMN code completed. This code needs a design baseline and an implementation baseline completed before it can be certified.
- Issue 3. The WWW provides access to a variety of home pages, including ones for YMP and OCRWM. In an effort to improve access to our procedures and to make an overview of our program available to a large number of individuals, the Software Coordinator has been tasked to create a home page for the group, with sections for QA, controlled documents, procedures, forms, etc.

Issue 4. Some software programs that are purchased (i.e., they are considered to be in the "acquired" category) may allow someone to create a macro. Some macros could place the software in the science and engineering (or SES) category, which would then require certification. We have conveyed this information to our investigators who now will use the notebook procedure (QP-03.5) to document when these types of codes are used.

2.5.2 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.

The revised software procedures appeared to work, but there was not enough activity to definitively state that they are more efficient. Regardless, the new procedures had 40% less text and the number of forms was reduced from nineteen to six in an effort to streamline the process. It was determined that "read only" training would be adequate. Our current software configuration control can be easily modified, but it appears to meet our needs. No system was identified that would justify changing the existing system. A local area network was established and is now being extensively used. All goals were met.

2.5.3 Goals for FY96.

- Determine the impact of any new software configuration control requirements.
- Certify the code FEHMN.
- Create a home page.

2.6 Records.

Records are locally submitted to a Records Processing Center (RPC) where they are checked for completeness before being forwarded to the Central Records Facility (CRF). The RPC maintains dual copies until notified by the CRF, whereby the RPC's copies are destroyed.

Record submittals were tracked by group from 1992 to 1994 (Bolivar, 1995). Group EES-13 (the management group), submitted more than 60% of the total number of records in 1992; this year they've submitted about 40% of the total. Group EES-13/LV (the TCO group in Las Vegas) submitted 20% to 25% of the total. Two technical organizations (EES-1 and CST Division) submitted 5% to 10 % of the total. These four groups have accounted for over 96% of the records annually submitted to the YMP. However, because rejections by the Central Records Facility (CRF) have decreased annually since 1992, only cumulative totals are shown (Table VII).

Although the number of total records submitted decreases each year, the amount of pages submitted increases. Thus we have started to track the number of pages submitted. There is also an increase in the number of pages handled by the TCO in Las Vegas, where individual packages can obtain volumes of several hundred pages each. The Records Coordinator will continue to monitor submittals to ensure that a negative trend doesn't develop.

Table VII. Records Statistics for 1992 through 1995.

Year	Documents Submitted to RPC	RPC Rejections	CRF Rejections	Pages Submitted
1992	971	117 (12%)	36 (3.7%)	NA
1993	816	101 (12%)	4 (0.5%)	NA
1994	800	123 (15%)	1 (0.0013%)	~100,000
1995	694	56 (8%)	1(0.0014%)	16,778

(1995 totals are for 9 months only)

2.6.1 Issues.

Issue 1. 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 record management plan that does not qualify as a requirement document in the eyes of quality assurance but that does 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 a "hands-on" mandatory training class. The class was offered five times in 1994, and the majority of YMP personnel trained to it.

The 1995 CRF rejection rate of 0.0014% is one of the lowest in the YMP (Table VIII); the internal rejection rate of 8% is almost half that of the previous year. These trends can be at least partly attributed to the records management class offered in 1994. Because of changes in records processing requirements and budget cutbacks, this class was not offered in 1995. Should record package rejections increase, this class may be reinitiated.

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 record retrieval process, we hesitate to throw these documents away until we verify that the records have been captured. Unfortunately we were able to make very little headway against this problem in 1995. Since FY96 budgets will decrease even further, these documents will remain in limbo. 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. It has always been difficult to get investigators to obtain accession numbers (tracking numbers the YMP assigns to documents). Since all quality documents have a unique identifier, these numbers represent a duplication of effort. They can also be very time consuming to obtain for new references. The YMP has agreed that it is no longer mandatory that we submit these numbers with documents (rather, they will assign these numbers after documents are submitted). This will help us submit documents in a more timely manner.
- Issue 4. The Q Team initiated a primary record identifier in 1994. This number can be used to quickly retrieve documents in the YMP record system. However, there are still indexing and retrieval problems with previously submitted records. Because we can not ensure that our primary identifiers will get indexed, we will remove this requirement from our records management procedure the next time it is revised. This is not a malicious action, rather it is being done to remove a bureaucratic obstacle that was self-imposed and that offers no added value.
- Issue 5. In an effort to save money, the Laboratory volunteered to look into transferring potential indexing responsibilities to Sandia National Laboratories. This was interpreted by the Central Records Facility people that we would let Sandia handle all of our records transactions. This is not the case. We will continue to check our records before we submit them.

2.6.2 Goals for 1995.

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

The records process was studied throughout 1995. Unfortunately, the process in Las Vegas is undergoing review with the potential for extensive change. Until any new changes are identified, our records system must operate in its current mode. Our Project Office Liaison has made tremendous progress in conveying our concerns to records personnel and has helped resolve several outstanding issues (such as indexing and accession numbers). The records management class is offered on an as-needed basis. All goals were met.

2.6.3 Goals for FY96.

- Continue to study the records process and implement more efficiency after the M&O process becomes better defined.
- Determine if the primary record identifier is truly needed; if not then remove it from QP-17.6.

2.7 Controlled Documents. The majority of controlled documents issued in 1995 were QPs and DPs (Appendix B). The controlled document system works smoothly, and there were not many associated issues. However, in an effort to be proactive and reduce the amount of paper that has to be handled, QPs and their associated forms were placed on the EES-13 LAN. This LAN also contains distribution lists, organization charts, and surveillance schedules.

2.7.1 Issues.

- Issue 1. In order for everyone to have access to our controlled documents, we are examining the possibility of placing all documents on the WWW. We are also struggling with whether to provide a separate file for forms or to have interactive forms that can be shipped electronically.
- Issue 2. When scanning a document (which will be entered into the home page), the logo on our procedure front page must be entered as a bit map (i.e., a graphic image). This causes it to take a long time to scan documents into the home page. We are examining ways to speed up this process.

2.7.2 Goal for 1995.

- Determine if further improvements can be implemented .

We determined that the controlled document system works very smoothly as is and decided not to expend further efforts. The one goal was realized.

2.7.3 Goal for FY96.

- Determine if controlled documents can be put onto a home page and accessed by personnel who use them.

2.8 Travel, Presentations, and Publications. Quality organization representatives attend Project meetings, workshops, and training classes and provide presentations as required. For example, the QAPL attends DOE quarterly quality assurance committee (PQAC) 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 VIII and presentations made are listed in Table IX. Publications are found in Section 6.0, References. These include conference articles (Day and Bolivar, 1995; Burningham and Thompson, 1995), a technical reference guide (Environmental Safety Services, 1995), and all status reports (Bolivar, 1992; 1994; 1995; 1996).

2.8.1 Issues

- Issue 1. Because of the transition to the M&O, it is not clear that the information in this status report is being used or that this report is the best method to report activities.

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.

Day and Bolivar (1995) provided a paper at a professional meeting. The status report was completed in 1995 but probably will not be published until early 1996. The length of preparation was three months less than in 1994 (but it still can be shortened considerably). All goals were completed.

2.8.3 Goals for FY96.

- Publish one professional paper on some aspect of the quality program.
- Determine if the status report is the best medium to report quality program issues.

Table VIII. Meetings Attended in 1995.

Meetings	Attendees	Month
Technical Data Management Las Vegas, NV	M. Herrera	1/18-19/95
Technical Project Review Las Vegas, NV	S. Bolivar	2/14-15/95
23rd Annual Energy & Environ. Q Div. Arlington, VA	S. Bolivar	2/27-28/95
Q Team, Las Vegas, NV	A. Burningham	2/7/95
Project QA Committee Meeting (PQAC) Las Vegas, NV	S. Bolivar L. Wichman	3/7/95
Software Advisory Group Las Vegas, NV	B. Gundlach	3/13-14/95
Pre-audit Conference Las Vegas, NV	S. Bolivar	3/20-21/95
Transition Plan to M&O Las Vegas, NV	S. Bolivar	3/16/95
Records Management Committee Las Vegas, NV	S. Martinez J. Day	3/21/95
Quality Coordinators Meeting Kansas City, NM	J. Day P. Gillespie	3/27-28/95
Q New Mexico, Albuquerque, NM	S. Bolivar	4/30-5/1/95
PQAC, Livermore, CA	S. Bolivar	4/26/95
Internat. High-Level Rad. Waste Meeting, Las Vegas, NV	S. Bolivar	5/22/95
Audit Schedule Discussions Las Vegas, NV	S. Bolivar	5/23/95
PQAC, Albuquerque, NM	S. Bolivar	6/6/95
Oconee Nuc. Power Plant & Bad Cr. Storage, Clemson, NC	S. Bolivar	6/26-29/95
World Conf. On Software Quality San Francisco, CA	B. Gundlach	6/20-23/95
Budget Discussions, Las Vegas, NV	S. Bolivar	7/7/95
Q Team, Las Vegas, NV	Q Team	7/11-13/95
PQAC, Las Vegas, NM	S. Bolivar	8/16/95
Nucl. Inform. Rec. Mgmt Assoc (NIRMA), Washington, DC	S. Bolivar, A. Burningham, J. Day	8/27-30/95

Table IX. Presentations.

Presentations	Presenter	Date
Orientation for QA Program, to attendees, Los Alamos, NM	S. Bolivar	2/9/95
Criticality Issues, to PQAC personnel	S. Bolivar	3/7/95
The Los Alamos QA Program, to M&O (PQAC), Las Vegas, NV	S. Bolivar	3/16/95
Changes in the Quality Program and Achievement Awards, to All Hands Meeting, in Los Alamos, NM	S. Bolivar	3/22/95
Changes in the QA Program, to All Hands Meeting Los Alamos, NM	S. Bolivar	6/16/95
Presentation of The Role of the Quality Assurance Liaison, to Nucl. Inform. Records Management Assoc. (NIRMA) Symposium, Washington, DC	J. Day	8/28/95
Presentation of the Test Coordination Office records system, to Nucl. Inform. Records Management Assoc. (NIRMA) Symposium, Washington, DC	A. Burningham	8/29/95

2.9 Verification Activities. Paul Gillespie became Verification Coordinator in January. We were ordered by the DOE to transition the audit function to them in 1995. We opted to conduct our own audits during the fiscal year so that DOE would not have to take over this function in the middle of the year. In 1995, six internal audits and five internal surveys were conducted (Tables X and XI). Subsequently, five deficiencies were issued (Table XII). This is the second year that the number of deficiencies issued was less than twenty. It is easier to maintain an effective quality program by keeping the number of issued deficiencies relatively small. Because 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.

A management assessment was to be conducted late in September. However, there was a scheduling conflict with the assessment team. Because of budget uncertainties and because the DOE assumed this responsibility in FY95, the assessment was canceled. However, we received the results of an independent management system survey (i.e., not related to the YMP) conducted by one of the Laboratory's assessment teams. The survey revealed that the Los Alamos YMP uses two management systems. This redundancy is caused by the inefficiency of one system, making the second system necessary to maintain control. In general, employees are happy, and job satisfaction and morale are good. There is strong management support, and most employees feel empowered. Because of extensive travel to Las Vegas by the TPO, some issues may not be addressed in a timely manner. These problems could be handled by having the TPO delegate more tasks. Lastly, the group felt that the technical side of the house should work on improving relations between DOE and Los Alamos.

Table X. Internal Audit Schedule.

Audit Number	Date	Group
LA-AR-EES-1/PSU-95-01	3/13-14	ESS-1 (Pennsylvania State University)
LA-AR-EES-1/YU-95-02	3/15-16	EES-1 (Yale University)
LA-AR-EES-1-95-03	4/3-6	EES-1
LA-AR-EES-4-95-04	4/19-20	EES-4
LA-AR-EES-13/LV/VOL-95-05	4/25-5/28	EES-13/LV
LA-AR-EES-13/VOL-95-06	5/22-6/14	EES-13

Table XI. Internal Survey Schedule.

Survey Number	Date of Survey	Reason for Survey
LA-SR-EES-5-95-01	4/17-20	To determine if any Q work was being done
LA-SR-EES-15-95-02	5/16-31	Final examination of activities before closure
LA-SR-LS2-95-03	6/21-7/7	To determine status of beginning activities
LA-SR-EES-13-95-04	6/27-7/14	To examine implementation for selected controlled document holders
LA-SR-EES-13/LV/VOL-95-05	7/10-14	Evaluate data and sample traceability for volcanism report

Table XII. Internal Deficiencies Issued Each Year.

Year	Deficiencies
1990	128
1991	65
1992	22
1993	17
1994	19
1995	7

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 pre-audit meetings and provides 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 each year. Our subcontractors are treated as augmented staff. In the future we will conduct periodic surveys to ensure performance.

Issue 2. The QAPL and the Verification Coordinator met early in 1995 and discussed guidelines for improving the audit and surveillance process as well as other issues that needed to be looked at. These issues were also discussed at Q meetings. These are simply recommendations to try and improve upon a process that works relatively well. The following guidelines were established:

- Send out audit plans at least two weeks before the audit, and personally involve the appropriate investigators of the audit 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 have been followed.
- Audit reports should contain a section on strengths and good practices.
- If a deficiency 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 that the 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.
- Issue 4. The Test Coordination Office still is struggling with job packages, test planning packages, and work plans and with whether these documents represent planning documents or are implementing documents. After much discussion between DOE and the parties involved, it was decided that the best solution might be for Los Alamos to write one inclusive procedure. This option is being explored.
- Issue 5. There has been a minor problem with providing the DOE with technical specialists for audits. The TPO feels that because no funding is supplied, investigators actually get penalized by providing assistance (i.e., they still have to report their milestones, but with no cost or time adjustments. This problem was somewhat alleviated when specialists from a subcontractor were provided when DOE required assistance late in the fiscal year and Los Alamos YMP quality assurance could cover the cost. Unfortunately, schedule conflicts resulted in a cancellation of the planned audit. Due to budget cuts, we probably will be unable to provide specialists for FY96.
- Issue 6. The deficiency system used by Los Alamos was abolished in the transition to the new system to be used by all participants. The new system implements three levels of deficiencies whereby the DOE will be able to distinguish between relatively minor and major problems. Unfortunately, the new system is very paper intensive. With manpower reductions as the result of budget cuts, it may be difficult to keep up with the new process. To be objective, however, the system must be tried before it is further criticized.
- Issue 7. As a result of the transfer of the audit function to DOE, participants found that they could lose the ability to maintain certified lead auditors and auditors. This was a potential resource that DOE could call upon whenever the need arose. After much discussion, the DOE has agreed to allow participants to maintain their qualification procedures, but with the understanding that auditors would be used on an as-needed basis, and lead auditors would probably not be used. Los Alamos currently has ten certified auditors, of which five are qualified as NQA-1 lead auditors.
- Issue 8. In May, the QAPL authorized the Verification Coordinator to issue surveillance and audit plans and reports without QAPL signature. This was done to promote empowerment and to speed up distribution times. There have been no problems with the implementation of this policy.

2.9.2 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.
- In audit reports, include sections on good practices.
- Leave an evaluation sheet with auditees.

By the end of FY95, Los Alamos only had five open deficiencies. A draft procedure combining the work plan and job package procedures (QP-06.4) was drawn up and distributed for review. Investigators were involved directly in the planning of all audits and appreciated the opportunities for input. All audit reports recognized good practices. The audit team has started to leave evaluations with investigators in an effort to solicit improvement suggestions. All goals were achieved.

2.9.3 Goals for FY96.

- Maintain the number of outstanding deficiencies at less than ten.
- Revise the appropriate DOE procedures or write a new QP so that work plans are not a contentious issue.
- Continue to involve investigators in planning audits.
- Continue to use surveillance performance evaluation sheets and use the information to improve the process.

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 19. New staff were introduced, and the plan for transition to the M&O was presented and discussed. G. Guthrie also discussed the health effects of erionite. This meeting included a DOE planning team (A. Gil, J. Summers, and R. St. Clair) that discussed current transitions to the M&O. Over sixty YMP personnel attended. The second activity was an all-hands meeting, held June 15. Presentations included topics on quality assurance, volcanic risk simulations, and the TCO (Table XIII). The agenda included an update on quality assurance activities, the FY95 budget, TCO progress, and technical presentations on P-Tunnel and LIDAR activities. However, the focus of the meeting was the impending transfer to the M&O and the impact it would have on our work. In February, investigators briefed Steven Hanauer, Science Advisor to the OCRWM, on YMP programs.

2.10.1 Issues.

- Issue 1. The Los Alamos YMP information brochure ("The Quality Connection") was not published because it is difficult for the QAPL to devote time for providing this publication. The brochure provided 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 it has not been published regularly. This probably dilutes its message. The QAPL conducted a survey which revealed that most people like the one-page format and content. Most suggested that it only be issued when needed. The QAPL consequently decided to cancel its publication while maintaining the possibility of reissuing it at some future date.
- Issue 2. The transition of Los Alamos to being a teammate on the M&O is very difficult for Los Alamos personnel. Most have never been in this type of working relationship. However, for the Laboratory to succeed in the YMP, it will be necessary for all personnel to make this transition work.
- Issue 3. A newspaper article appeared that had two scientists at Los Alamos (not members of the YMP group) suggesting that the repository might "erupt in a nuclear explosion" if certain conditions evolved. Officials at DOE were upset with the content, whereas scientists at Los Alamos were upset with the political methods used to release the paper before it could be technically reviewed. Eventually several reviews were conducted by various organizations and teams, and the paper was found to be lacking in technical credibility.

2.10.2 Goals for 1995.

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

The two meetings were held. The QAPL decided to discontinue the publication of "The Quality Connection" brochure. All goals were met.

2.10.3 Goal for FY96.

- Hold one annual YMP meeting and one all-hands meeting.

Table XIII. Program Agenda for the Annual YMP Meeting

Subject	Speaker
Changes in the Quality Program	Stephen L. Bolivar, QAPL
Life inside Yucca Mountain (TBM and TCO Activities)	Ron Oliver, Project Leader
The P-Tunnel Wars	Gilles Bussod, Site and Regulatory Project Leader
LIDAR—Our Desert Storm in Nevada	Dan Cooper, Principal Investigator
YMP Update—The Latest News from the Front	Julie A. Canepa, TPO

3.0 TREND ANALYSIS

3.1 Introduction. The purpose of this section is to summarize the three trend reports issued in 1995. DOE and internal audit and survey reports, stop work orders, and other quality assurance documents, such as deficiency report logs, 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 and other participants.

3.2 Methodology. The Los Alamos corrective action report (CAR) log and the DOE deficiency reports data base were 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 C). 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 M&TE for being 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 surveillances. However, a group category is normally not identified because these deficiencies usually represent a Laboratory-wide problem.

Lastly, DOE and Los Alamos audits, surveys, 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 1995, six internal audits and five internal surveys were conducted. Most of the identified deficiencies are minor and have to do with a lack of attention to detail. All reports were issued within two to three weeks after the audit or survey was completed. Table XIV lists the findings.

3.4 Internal Deficiencies. In 1995, seven internal deficiencies were identified (Table XV). This compares to nineteen CARs issued in 1994, and seventeen in 1993. 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 an essentially 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. Figure 2 supports this hypothesis.

Table XIV. Summary of Internal Audit and Survey Findings.

Audit or Survey Number	Group	Deficiencies Identified	Deficiency Issued	Criteria Examined and Status
LANL-AR-EES-1/PSU-95-01	EES-1 (PSU) Contractor	five	none	2, 4-6,12,SIII adequate but improvement needed 7,17,SII indeterminate
LANL-AR-EES-1/YU-95-02	EES-1 (YU) Contractor	eleven	CAR 253 CAR 254 CAR 255	4-6 adequate and effective 2,12,SIII adequate but improvement needed 7,17,SII indeterminate
LANL-AR-EES-1-95-03	EES-1	none	none	2,6,12,17,SII,SIII adequate and effective 4,5,7 indeterminate
LANL-AR-EES-4-95-04	EES-4	none	none	2,6 adequate and effective 4,5,7,SII indeterminate 12,17,SIII not fully assessed
LANL-AR-EES-13/LV/VOL-95-05	EES-13/LV	one	none	2,5,6,17 adequate and effective SII adequate but improvement needed 4,7,12,SII indeterminate
LANL-AR-EES-13/VOL-95-06	EES-13	three	none	2,6,17 adequate and effective 4,7 SII,SIII adequate but improvement needed 5,12 indeterminate
LA-SR-EES-5-95-01	EES-5	none	none	2,17,SI,SIII adequate and effective
LA-SR-EES-15-95-02	EES-15	one	none	2,5,6,SIII adequate and effective 12 adequate but improvement needed 4,7,17,SI,SII indeterminate
LA-SR-LS-2-95-03	LS-2	three	none	2,4,12,17 adequate and effective 6,SII,SIII adequate but improvement needed 5,7 indeterminate
LA-SR-EES-13-95-04	Document Control	three	none	5,6 adequate and effective
LA-SR-EES-13/LV/VOL-95-05	Volcanology/LV	none	none	17, SIII adequate & effective

Table XV. Deficiencies Issued in the Last 12 Months.

Deficiency Report	Group	Abbreviated Description
LA-CAR-243	SU	Notebook entries do not follow prescribed format
LA-CAR-244	SU	No bill of lading record available for shipped sample
LA-CAR-245	CST-7	Co-authors had not received training on DP preparation
LA-CAR-246	voided	Several supervisors missing training to 2.x revisions
LA-CAR-247	CST-7	Various documentation missing for several PRs
LA-CAR-248	CST-7	PR packages incorrectly compiled; documentation missing
LA-CAR-249	CST-7	Supplier requirements documentation missing for PRs
LA-CAR-250	CST-7	Sample incorrectly stored
LA-CAR-251	EES-4	Prototype work not identified as such in notebook
LA-CAR 252	PSU	Calibration of M&TE not correctly documented
LA-CAR 253	YU	Supervisor orientation not documented
LA-CAR 254	YU	Initial entries for notebook in error
LA-CAR 255	YU	Three pieces of M&TE not calibrated correctly
LA-CAR 256	Records	QP-17.6 out of compliance with YAP 17.1 on accession numbers
LANL- 95-D-001	Controlled Documents	QA manual held by person not on YMP; various superseded documents in manuals or required documents not in manuals
LANL- 95-D-002	EES-1	XRD PN 819049 out of tolerance

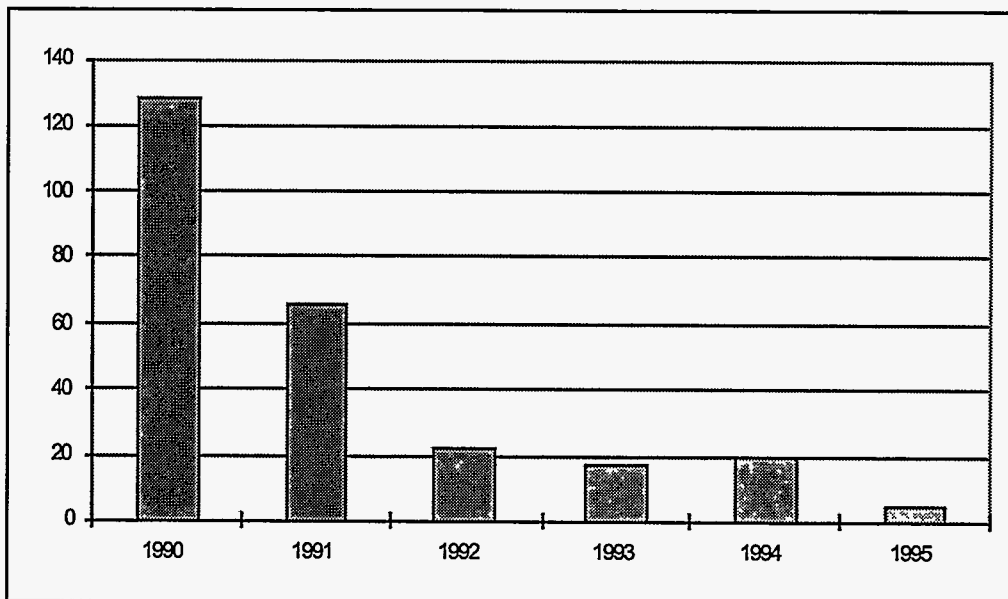


Fig. 2. Internal deficiencies issued since 1990. The actual data is given in Table XIV.

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. There are no open stop work orders and no new stop work orders nor conflict resolutions occurred (Table XVI).

Table XVI. 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

3.6 DOE Audits, Surveillances, and Issued Deficiencies. The DOE conducted two audits in 1995 (Table XVII). Four minor deficiencies were fixed during the audit and no formal deficiencies were issued. Investigators performed satisfactorily in the audited criteria. There are no open DOE deficiencies. Adverse trends are described in Section 3.7.

Table XVII. 1995 DOE Audits of the Los Alamos YMP.

Activity	Date	Result
Audit YM-ARP-95-06	January 9-13, 1995	Performance-based audit. One minor problem with a notebook signature fixed during audit.
Audit YM-ARC-95-11	May 8-12, 1995	Compliance-based audit. Three minor problems with M&TE fixed during audit.

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 (Table XV). The majority of deficiencies represent isolated instances of nonconformance. However, there are three CARs issued against infractions on procurement (CARs 247, 248, 249). This trend has already been recognized (adverse trend AT-94-01 in Table XVIII). Because the procurement procedure was revised shortly after these deficiencies were issued and because there have been no further deficiencies issued in this area, this probably isn't a continuing concern.

There are also three deficiencies (CARs 252, 255 and LANL-95-D-002) concerning M&TE. These three problems involved three different people and three different pieces of equipment. In one case, an instrument was out of tolerance and the procedure required that a deficiency report be issued. In another instance the instrument was used before the calibration documentation (which was already done) was sent to the M&TE Coordinator. The third instance was more significant in that the person involved did not follow the procedure correctly. Two of these instances are problems with contractor personnel, rather than with the M&TE process. This issue will be discussed below.

There are six deficiencies that were issued against three subcontractors (SU, PSU, and YU). Most of the deficiencies were relatively minor and can be attributed to "lack of attention to detail" or oversight. However, at least two of the deficiencies (CARs 243, 255) were the result of failure to follow the appropriate procedure. This adverse trend (AT-95-01 in Table XVIII) indicates that contractors need closer supervision with respect to quality requirements. The QAPL has notified the appropriate QALs, who will in turn monitor their contractors more closely. Since these contracts were terminated on 9/31/95 due to budget shortfalls, the trend has been closed. Should these contracts be reinitiated, these concerns will be closely monitored.

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 might increase, because these revisions represented a new baseline for quality requirements. However, in 1995, our verification personnel found relatively few problems.

Table XVIII. 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 on 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 deficiencies issued against the procurement process.	Closed (QP-04.6 revised 12-94)
AT-95-01	Contractors received numerous deficiencies compared to other YMP groups.	Closed (Contracts terminated 9/31/95)

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 in terms of the total number of deficiencies identified or resolved during YMP audits for calendar year 1995. 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 1995 YMP performance-based audits were examined for selected participants. The data, which are not inclusive of all participants or all audits, were tabulated from audit reports distributed to participants. Deficiencies were weighted, and the results are presented in Figure 3. It is difficult to compare specific organizations because the scope of work varies greatly. The results from performance-based audits also only reflect how a selected area of study is doing, and do not accurately represent the overall performance of the selected organization. However, the data do indicate general trends and show a wide range of performance. 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 deficiency report (e.g., a CAR or DR) are assigned two points.

Unfortunately, Fig. 3 may give a somewhat biased view of a participant's program. The figure does not include deficiencies issued as the result of surveillances or other assessment activities. The US Department of Energy Office of Civilian Radioactive Waste Management annually issues a report that tabulates all CARs issued to participants (Fig. 4). Because the report for 1995 hasn't been issued yet, data for 1994 are shown. This type of presentation is probably a better representation of a participant's overall program. However, since each participant conducts unique work for the YMP; these types of comparisons are not truly indicative of performance, they only indirectly indicate the overall health of an individual participant's quality program.

Another way to look at performance indicators is to look at trends, i.e., whether the number of deficiencies increasing or decreasing annually. Deficiency reports issued to Los Alamos for the period 1987 to 1995 are displayed in Fig. 5. The number of deficiencies resolved during audits generally decreases from 1987 to 1993.

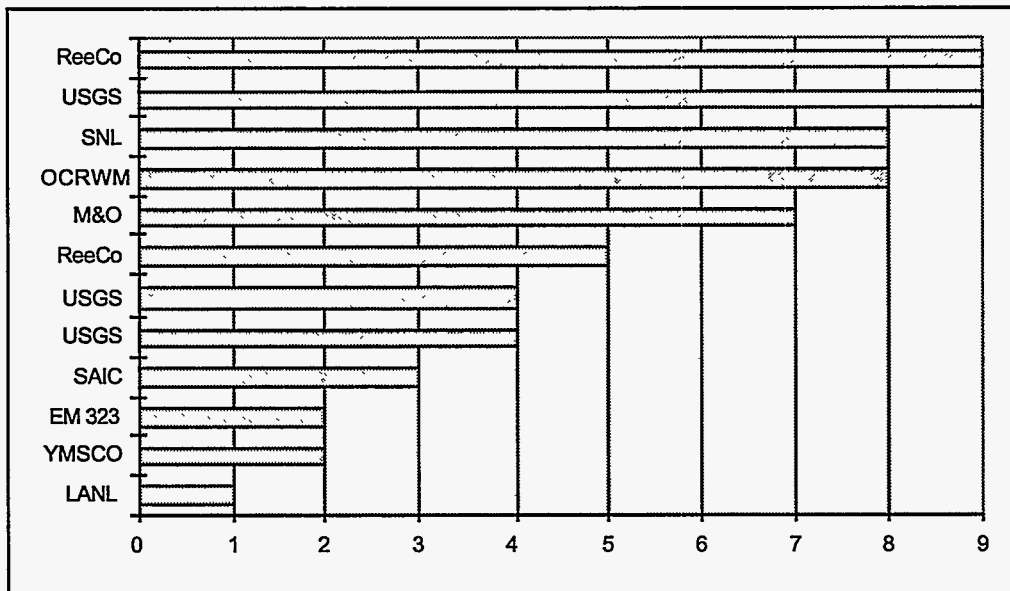


Fig. 3. Representative Deficiencies Resulting From DOE Audits. Deficiencies are weighted; those formally issued (as CARs) are multiplied by two, whereas those resolved during audits are multiplied by one. (Key: ReeCo = Reynolds Electric Company; USGS = United States Geological Survey; SNL = Sandia National Laboratories; OCRWM = Office of Civilian Radioactive Waste Management (headquarters); M&O = Management and Operations Contractor TRW Environmental Systems, Inc.; EM 343 = Department of Energy, Washington DC group; YMPO = Yucca Mountain Project Office; LANL = Los Alamos National Laboratory.

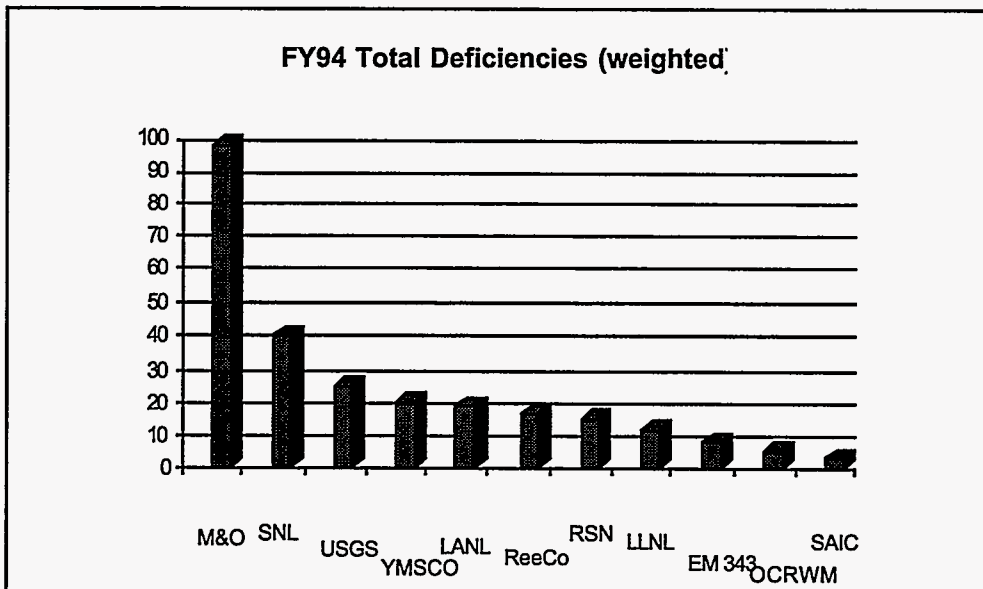


Fig. 4. CARs Resulting From All DOE Verification Activities. This data is for 1994 (the 1995 report hasn't been released yet). The CARs are not weighted. (Key: SAIC = Scientific Applications International Corporation; LLNL = Lawrence Livermore National Laboratory; LANL = Los Alamos National Laboratory; EM-343 = a Department of Energy, Washington DC group; USGS = United States Geological Survey; YMSCO = Yucca Mountain Site Characterization 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 TRW).

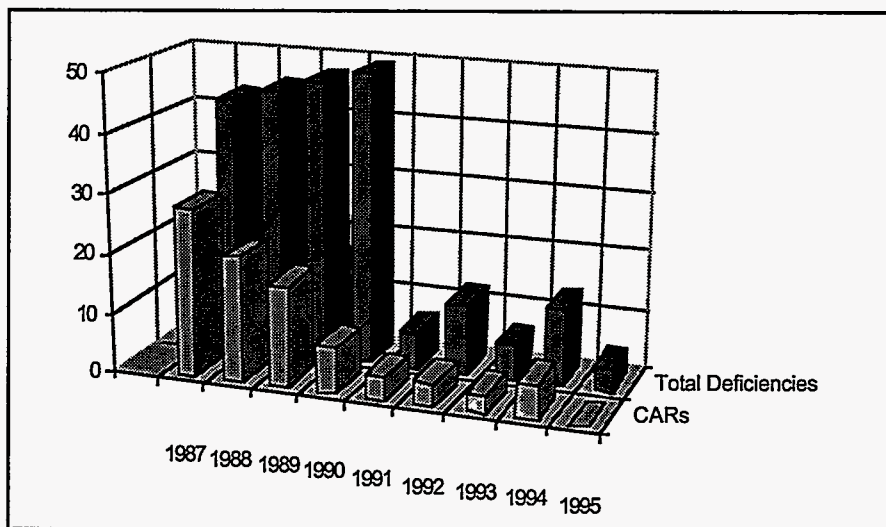


Fig. 5. CARs Issued to Los Alamos by the DOE. Plot compares total deficiencies (including deficiencies fixed during the examination) with formal deficiency reports issued (CARs). Deficiencies were identified in audits and surveillances. They are not weighted.

The number of formal deficiencies issued (such as CARs) also decreases from 1987 to 1993. In 1994, there is a small increase in the number of deficiencies. This was to be expected because the entire quality program was revised and new procedures were issued in January 1994. Consequently, the total number of deficiencies could decrease in 1995 as personnel become familiar with the new requirements. Figure 5 shows the 1995 value for Los Alamos to be zero, which supports this hypothesis.

3.9 Group Trends. During the calendar year, the Los Alamos Verification Coordinator conducted several internal audits and surveillances of various groups, including subcontractors, working on Los Alamos YMP activities. The number of internal deficiencies issued against these groups since 1991 is shown in Table XIX. These results are also plotted for eight of the groups (Fig. 6).

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. Other groups might have several deficiencies simply because of the volume of activity associated with their activity (e.g., records). In other words, the number of deficiencies identified in a particular group must be placed in overall context before it can be considered significant.

For most groups the number of deficiencies issued in 1995 is less than the amount for 1994. Although the program has matured and groups should have improved their performance over time, the number of deficiencies might have been expected to increase in 1995 because every procedure was revised in response to changes in the QARD. Part of the improvement could also be attributed to fewer audits and surveillances than in 1994 (about 50% fewer). However, part of the improvement could also be attributed to more conscientious work by investigators. Regardless, almost all groups show improvement over the last few years and no negative trends were recognized.

Unfortunately, this may not be the case with subcontractors. Many subcontractors are located a long distance from Los Alamos. Some subcontractors are also part of university bureaucracies, where the compliance nature of the YMP and the culture of the Laboratory are not fully appreciated. Consequently, one might expect more deficiencies to be issued to subcontractors than to Los Alamos groups. Figure 7 supports this hypothesis.

Table XIX. Los Alamos Deficiencies by Group.

Group	1991	1992	1993	1994	1995
EES-1	5 (5 fixes)	2 (3 fixes)	3 (6 fixes)	2 (7 fixes)	1
EES-4	2 (1 fix)	0 (1 fix)	1	1 (1 fix)	0
EES-5	7	0 (4 fixes)	0	0	0
EES-13 Management	10	0 (1 fix)	3 (9 fixes)	2 (3 fixes)	NA
EES-13 Software	N/A	7 (1 fix); SWO-08	1	1	NA
EES-13/LV TCO	0 (4 fixes)	0	1 (8 fixes)	0 (2 fixes)	NA
EES-13/LV, VOLC	0 (3 fixes)	2 (5 fixes)	0 (18 fixes)	0 (1 fix)	0 (4 fixes)
EES-15	1 (1 fix)	0 (1 fixes)	0	0	0 (1 fix)
LS-2	5 (1 fix); CR-01	NA	NA	NA	0 (3 fixes)
CST	10 (4 fixes)	1	3 (17 fixes)	8 (10 fixes)	0 (1 fix)
UC-Riverside	0	0	0	0	NA
UNM	3 (3 fixes)	1 (3 fixes)	0 (1 fix)	0	NA
LBL	5 (8 fixes)	1 (3 fixes)	0 (18 fixes)	6 (22 fixes)	NA
SU	3 (3 fixes)	N/A	1 (13 fixes)	2 (10 fixes)	NA
HGC	2 (2 fixes)	1	0	0 (8 fixes)	NA
PSU	NA	NA	NA	NA	1 (5 fixes)
YU	NA	NA	NA	NA	3 (6 deficiencies) (5 fixes)
M&TE	1	0	1	2	0 (2 fixes)
Records	1; SWO-07	1	2	0	1
Controlled Docs	0	0	0	0	1 (4 fixes)
Training	1	0	0	2	0
Audits	3	1	1	0	0
Q Organization	7; SWO-05, 06	2	0	0	0

Key: N/A = not applicable; SWO = stop work order; CST = all CST groups combined; deficiencies fixed during audits are listed in parentheses.

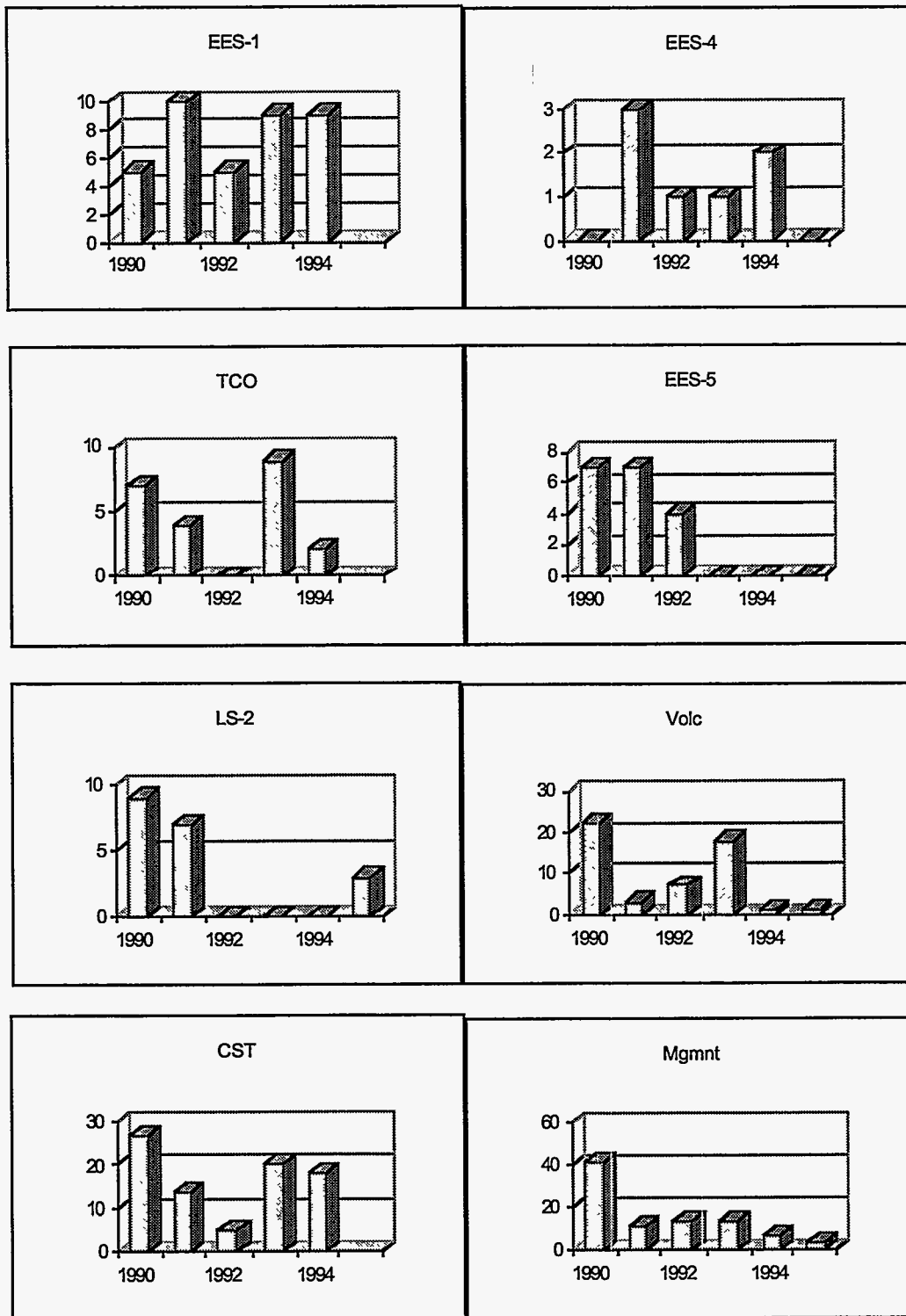


Fig. 6. Deficiencies issued to selected groups. Data taken from Table XIX.

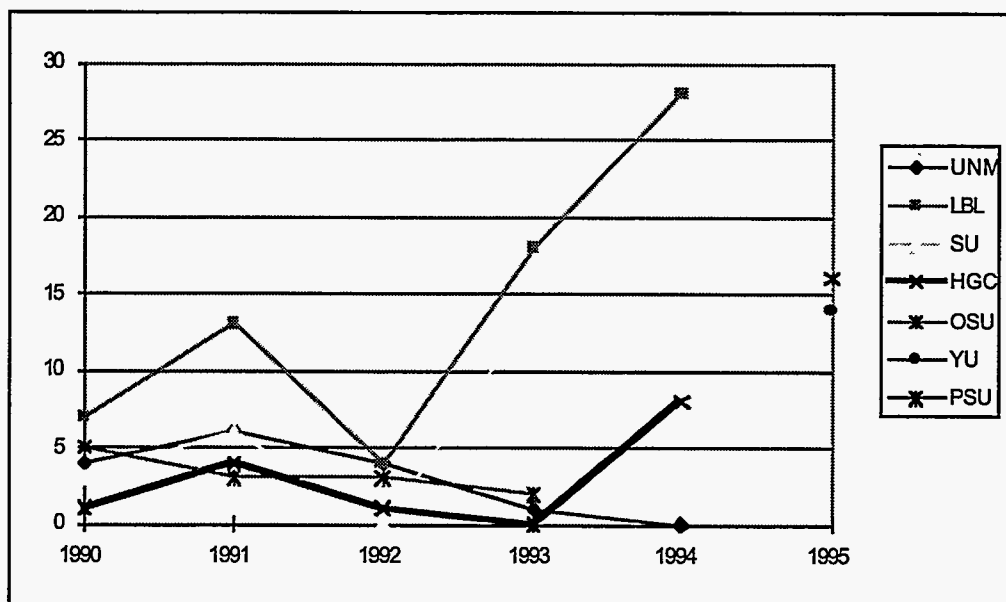


Fig. 7. Number of deficiencies (y-axis) issued to subcontractors from 1990 to 1995. (Contractors: UNM = University of New Mexico; LBL = Lawrence Berkeley Laboratory; SU = Stanford University; HGC = HydroGeoChem; OSU = Ohio State University; YU = Yale University; PSU = Pennsylvania State University).

Most subcontractors show improvement trends until 1993. In 1993, the work for two contracts (LBL and SU) was scheduled for completion, so audits and surveys were conducted to ensure that final documents were prepared and acceptable. This resulted in several findings. In 1995, two new subcontractors were examined for the first time (YU and OSU); thus they might be expected to have some findings. Regardless, the identified deficiencies were of a minor nature, and all subcontracts were terminated at the end of FY95 because of budget cuts. Should any subcontracts be reinitiated, QALs will be asked to monitor the programs very closely.

3.10 Possible Adverse Trends Associated with Criteria or Procedures. The Los Alamos deficiency log was examined, and deficiencies were categorized by assigning each one to the QARD criterion with which it was they are associated. Having numerous deficiencies associated with a criterion does not necessarily signify an adverse trend, but it does help to identify areas of concern. Figure 8 shows this data grouped by criteria; obviously criteria six, twelve, and supplement III are possible areas of concern (for a criterion with deficiencies at low levels, an increase or decrease in frequency is insignificant). However, to determine if an adverse trend exists, the data must be examined in greater detail.

Appendix C lists the number of deficiencies noted against each QP. Table XX identifies those current procedures for which two or more deficiencies were identified in 1995. 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 identifying a true adverse trend.

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, -06.1 and -12.3). Procedure QP-03.5 corresponds to Supplement III in Fig 8. In 1995, we made a conscious effort to examine selected notebooks from each group audited or surveyed. 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 requiring a written formal deficiency such as a CAR). The number of deficiencies in criterion 6 (QPs-06.2, -06.3) are also numerous.

These deficiencies were mostly minor problems associated with controlled documents. Almost all were fixed during the respective audit or surveillance. A similar problem existed with M&TE. Several minor instances of non conformance were recognized (e.g., a calibration report was completed but had not yet been sent in). A couple of instruments were out of tolerance and this requires that a deficiency report be written. However, all deficiencies were minor and no trends are recognized. The other deficiencies are not excessive and merely represent minor infractions (these are described in detail in the quarterly trend reports).

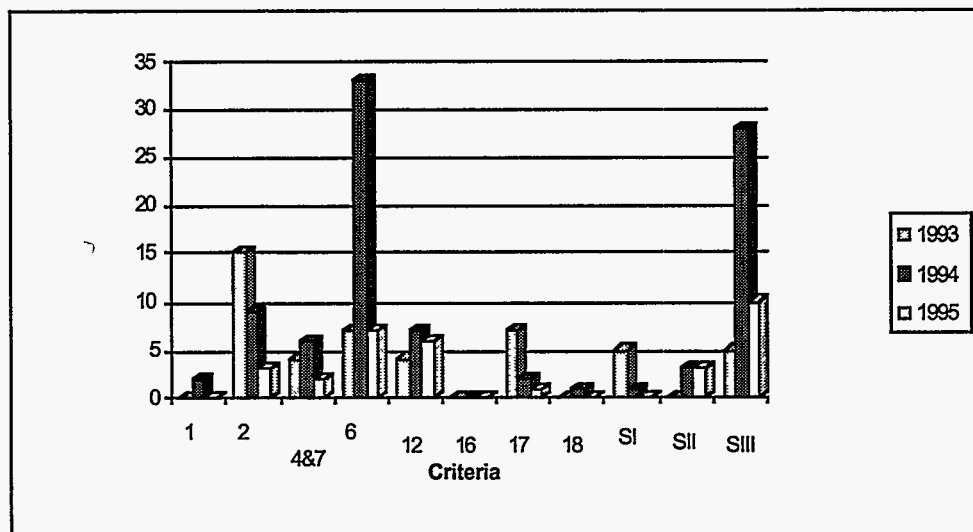
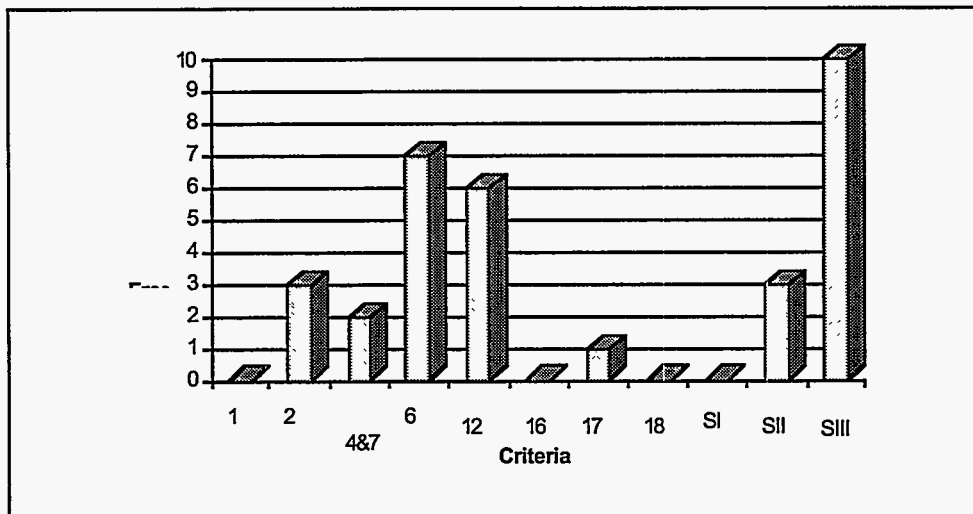


Fig. 8. Deficiencies correlated by QARD criteria. Top graph shows deficiencies associated with respective QARD criteria for 1995, whereas the bottom graph shows the data for 1993–1995. Deficiencies include both those formally issued and those resolved during audits and surveillances.

Table XX. Deficiencies Associated with Procedures.

Plan or Procedure	Title	Number of Deficiencies
QP-03.5	R&D (notebooks)	10
QP-04.6	Procurement	2
QP-06.1	Controlled Documents	7
QP-8.1	Samples	2
QP-12.3	M&TE	6

(only those with 2 or more deficiencies are listed).

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, which may not be valid for all deficiencies. However, this approach does reveal some interesting information.

The probable cause categories are (a) not trained (Table XXI), (b) failure to follow procedural guidance (Table XXII), (c) conflicting procedural guidance (Table XXIII), (d) oversight (Table XXIV), and (e) M&TE (Table XXV). These data are plotted in Fig. 9. Large numbers of associated deficiencies do not necessarily identify an adverse trend; as mentioned above, the data must be placed in the context of the overall program.

The number of probable causes attributed to not following a procedure correctly (Table XXII), lack of training (Table XXI), and conflicting procedural guidance (Table XXIII) have decreased compared to 1994 levels. The deficiencies attributed to not following a procedure dramatically decreased compared to totals for 1994. This probably is a result of every procedure having been revised and reissued in early 1994. During this process, poorly written sections in procedures were revised for better clarity. The deficiencies attributed to M&TE (Table XXV) are the same as in 1994 (i.e., one), but this level is so low that it is insignificant. These results suggest that the quality program is under control and improving and do not merit further discussion.

There is a slight increase in deficiencies associated with oversight compared to 1994 levels. Most of these deficiencies can be attributed to human error (Table XXIV). Possibly these problems are related to the implementation of recently revised QPs. In other words, people are not fully accustomed to the changes in the revised procedures. Because there are not similar problems with other probable cause categories (e.g., training) it appears plausible that this is the case. In response to these findings, the QAPL has asked the QALs to help investigators pay more attention to detail. Because the number of deficiencies for this probable cause is relatively low compared to the "big picture", this is an area for improvement but not a major concern.

Table XXI. Deficiencies Attributed to Lack of Training.

1993		1994		1995	
Deficiency/ Associated Procedure		Deficiency/ Associated Procedure		Deficiency/ Associated Procedure	
DR 216	QP-17.4	CAR 245	QP-02.5	AR-95-02-01	0QP-03.5
DR 216	QP-12.1		QP-02.7		
DR 219	DP-101		QP-02.11		
DR 221	QP-06.3	CAR-246	QP-06.2		
CAR-93-051	QP-17.4		QP-06.3		
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				

(numbering scheme explained in Appendix C).

Table XXII. Deficiencies Attributed to Failure to Follow Procedural Guidance.

1993		1994		1995	
Deficiency	Deficiency Resolved	Deficiency	Deficiency Resolved	Deficiency	Deficiency Resolved
DR 217	93-01-01	CAR 235	YA-94-08-01	CAR 251	AR-95-02-02
DR 225	93-07-01	CAR 239	YA-94-08-02	CAR 252	AR-95-02-03
DR 227	93-09-02	CAR 240	YA-94-08-03	CAR 254	AR-95-06-03
DR 222	93-10-03	CAR 241	YA-94-08-05	CAR 255	AR-95-01-02
	93-12-01	CAR 242	YA-94-08-06	LANL-95-D-01	AR-95-01-04
	93-12-04	CAR 243	YA-94-08-07		AR-95-01-05
	93-10-01	CAR 244	AR-94-04-04		YM-ARC-95-11-01
	93-10-04	CAR 247	AR-94-04-01		YM-ARC-95-11-02
		CAR 237	AR-94-05-01		YM-ARC-95-11-03
		CAR-94-083	(four)		SR-95-02-01
		CAR-94-078	AR-94-05-05		SR-95-03-01
		CAR-94-082	AR-94-05-06		
		CAR 233	AR-94-14-01		
		CAR 236	(six)		
		CAR 237	AR-94-13-01		
		CAR 247	(eight)		
		CAR 248	SR-94-09-02		
		CAR 249	(five)		
		CAR 250	SR-94-13-01		
			(thirty)		

(numbering scheme explained in Appendix C).

Table XXIII. Deficiencies Attributed to Conflicting Procedural Guidance

1993		1994		1995	
Deficiencies	Deficiencies Resolved	Deficiencies	Deficiencies Resolved	Deficiencies	Deficiencies Resolved
CAR-93-049	YA-93-11-1	CAR-94-083	YA-94-08-04	CAR-256	
CAR-93-050	93-04-03	CAR-94-078	YA-94-08-07		
CAR-93-051		CAR-94-079			
DR 226		CAR-94-081			
DR 218		CAR 234			
DR 220		CAR 236			
DR 221		CAR 244			
DR 222		CAR 243			
DR 232					

(numbering scheme explained in Appendix C).

Table XXIV. Deficiencies Attributed to Oversight.

1993		1994		1995	
Deficiencies	Deficiencies Fixed	Deficiencies	Deficiencies Fixed	Deficiencies	Deficiencies Fixed
DR 217	YA-93-11-02	CAR 242	AR-94-04-03	CAR 253	YM-ARP-95-06-01
DR 223	YA-93-11-03	CAR 240	SR-94-09-01	CAR 254	SR-95-03-02
DR 224	93-12-06	CAR 238	SR-94-09-07	CAR 255	SR-95-03-03
DR 229	93-02-01	CAR 247	SR-94-11-01	LANL-95-D-01	SR-95-04-01
DR 230	93-02-02	CAR 248	SR-94-11-02		SR-95-04-02
DR 231	93-09-05	CAR 249			SR-95-04-03
	93-04-01	CAR 250			AR-95-01-01
	93-04-02	CAR 251			AR-95-01-03
	93-09-06				AR-95-05-01
	93-12-05				AR-95-06-01
	93-06-01				AR-95-06-02
	93-06-02				
	93-07-02				
	93-10-02				
	93-09-01				
	93-12-02				
	93-12-04				
	93-09-03				
	93-10-04				

(numbering scheme explained in Appendix C).

Table XXV. Deficiencies Attributed to M&TE.

1993		1994		1995	
Deficiencies	Deficiencies Fixed	Deficiencies	Deficiencies Fixed	Deficiencies	Deficiencies Fixed
DR 228	Bal PN620505	CAR 242	Bal PN817330	CAR 255	Bal SN F39854
		CAR 233	NA		Bal SN F0911
		CAR 236	NA	LANL-95-D-02	Therm. SN 6L1490
					XRD PN 819049

(numbering scheme explained in Appendix C).

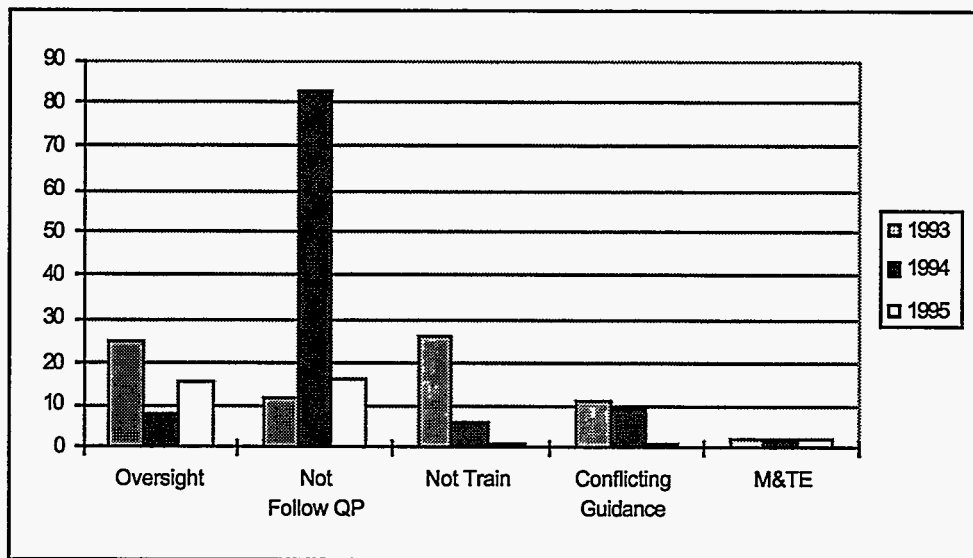
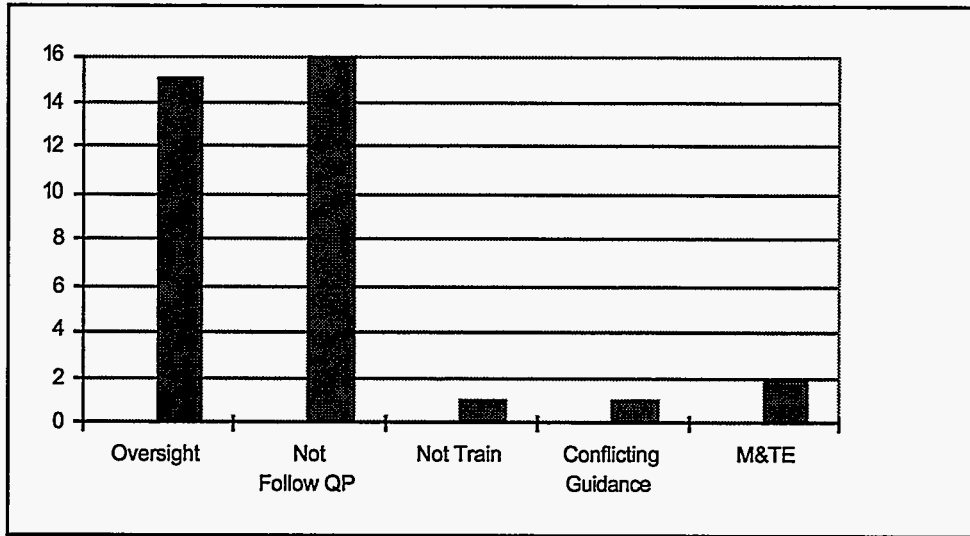


Fig. 9. Number of deficiencies (y-axis) assigned to probable cause categories. Top graph shows groupings for 1995. Bottom graph shows data for 1993-1995.

4.0 WHAT DOES THE FUTURE HOLD?

FY96 (October 1, 1995 to September 30, 1996) will be a pivotal year for all support activities, including quality assurance. FY96 began with a drastic reduction in funding. The budget was reduced by 50% with very little advance warning. Many support functions, which were handled by subcontractor employees, were put on hold until budget uncertainties could be resolved. Much of the remainder of FY96 will be used to try to adapt to the reduced funding level, while yet maintaining a vigorous quality program.

There were two significant transitions in 1995. First, Los Alamos National Laboratory joined the M&O team. Rather than report directly to DOE, Los Alamos now reports to the M&O. This approach, after all of the mechanics have been worked out, may help reduce the work load in some areas. It could also result in poorer communication between the Laboratory and the DOE.

The second transition required moving audit responsibilities and the tracking of internal deficiencies from Los Alamos to the DOE. This also may result in less auditing "overhead". On the negative side, it might be harder to maintain the same level of quality simply because there will be fewer audits to ensure compliance, and the audits performed will be by individuals who are not completely familiar with the Los Alamos program. However, this approach should decrease overall audit costs.

The future efforts by DOE and the M&O team will be to consolidate into one coherent quality program. Ideally this would help reduce duplication of effort and would result in a much more efficient approach. Unfortunately, each organization has a "culture" that must be integrated into the team. This will require tremendous dedication by those involved if there is to be any hope of succeeding. Communication will be the key. If new processes are "handed down", they will not have much chance for success. However, if personnel who are involved in the processes are consulted and their needs and concerns are addressed, then everyone will benefit and the new way of doing business will succeed. There will also be a concerted effort to do "more with less". Change is difficult and it will take dedicated efforts by all of those involved to ensure its success, not only to help reduce costs but also to ensure that the change results in a process that will work rather than introduce additional problems.

5.0 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 1995, this team identified nine core values, established vision and mission statements, and as a result of a self-assessment, modified its goal-setting and performance-measuring process. Efforts were also spent on making several processes, such as personnel verifications, more efficient. However, the most time-consuming activity was the revision of procedures in response to the revision of the QARD (the regulatory guidance document), the transition of the audit and deficiency tracking functions to the DOE, and the transition of Los Alamos to the M&O team. Thirty quality administrative procedures were reduced to twenty-three documents. Many of the revisions simply involved minor changes. However, five software documents were condensed to two, nineteen forms were reduced to six, and 40% of the text was eliminated in the most dramatically revised process. Forms and procedures are available on a local area network, and future efforts will be to make these documents available on the Internet. Records personnel submitted several hundred records to the Project's records repository with a rejection rate of only 0.0014%. An independent management survey found happy employees, high job satisfaction, and good morale. Efforts in FY96 will be directed towards adapting to a 50% budget cut, while maintaining a strong quality program.

Verification activities have helped the quality organization identify specific problems in the Los Alamos YMP. These problems are addressed as resolutions to deficiencies issued as part of internal or DOE verification activities. In 1995, the DOE personnel conducted two audits of Los Alamos activities. No corrective action reports were issued. Because all audit and deficiency report tracking functions were to be transferred to the DOE by 7/31/95, Los Alamos chose to complete their audit and survey schedule internally before this transition date. Los Alamos verification personnel conducted six audits and five surveys internally. This resulted in three CARs and several minor problems that were fixed during the activity. The cited deficiencies do not indicate any major problems with the quality program. A mandatory training class offered in 1994 was apparently successful in helping to reduce the number of deficiencies in 1995 that were attributed to "lack of attention to detail." Audited individuals were responsive to and knowledgeable about the YMP quality assurance requirements.

Trend analysis reports were issued quarterly in 1995 and the results are summarized herein. 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. Most Los Alamos groups reduced the number of deficiencies issued in 1995 compared to 1994. This is partly the result of more quality awareness and partly the result of better-written procedures. One adverse trend was recognized. Subcontractors were found to have rather high totals of deficiencies compared to their Los Alamos counterparts. This trend disappeared in FY96 when the appropriate subcontracts were terminated. 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 five years, the number of both Project and internal deficiency reports issued to Los Alamos personnel has decreased.

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 surveillance activities are decreasing over time. Los Alamos personnel are annually improving upon the processes used to meet quality assurance requirements.

6.0 REFERENCES

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ACKNOWLEDGMENTS

Special thanks to S. Klein for help in preparation of this document. This work was supported by the Yucca Mountain Site Characterization Project as part of the Civilian Radioactive Waste Management Program. The YMP is managed by the US Department of Energy, Yucca Mountain Site Characterization Project. This report is not governed by the Quality Assurance Requirements and Description (QARD). It does not introduce any new data, only summarizes previous activities.

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 (YMP). Representatives of the following groups are considered charter members and normally attend every meeting:

Project Office Liaison
Verification
Records
Document Control
Management (Quality Assurance Project Leader)
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- to 2-hour) meetings as needed.

Format: The Quality Assurance Project Leader (QAPL) 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 in 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
Controlled Documents Issued in 1995

Table B-1. Controlled Documents (QPs) Issued in 1995.

ADMINISTRATIVE PROCEDURES		
LANL-YMP-QP-01.2, R3	Stop Work Complete	ISSUED 1/20/95
LANL-YMP-QP-01.2, R3	Stop Work Complete	DELETED 7/31/95
LANL-YMP-QP-01.4, R3	The Los Alamos YMP Organ. and Q Program Description	Issued 7/31/95
LANL-YMP-QP-02.4, R3	Management Assessment	Issued 7/31/95
LANL-YMP-QP-02.4, R3	Management Assessment	Deleted 9/28/95
LANL-YMP-QP-02.11, R4	Personnel Orientation	Issued 7/31/95
LANL-YMP-QP-03.5, R5	Documenting Scientific Investigations	Issued 9/5/95
LANL-YMP-QP-03.20, R3	Software Configuration Management	Issued 9/28/95
LANL-YMP-QP-03.20, R4	Software Configuration Management	Issued 12/21/95
LANL-YMP-QP-03.21, R4	Software Life Cycle	Issued 9/28/95
LANL-YMP-QP-03.21, R5	Software Life Cycle	Issued 12/21/95
LANL-YMP-QP-03.23, R3	Preparation and Review of TIPs and Study Plans	Issued 9/5/95
LANL-YMP-QP-03.24, R1	Submittal of Design and Test-Related Information	Deleted 1/31/95
LANL-YMP-QP-03.25, R2	Review of Design and Test-Related Information	Issued 1/20/95
LANL-YMP-QP-03.26, R1	Review of Software	Deleted 9/28/95
LANL-YMP-QP-03.27, R1	Documentation of Software	Deleted 9/28/95
LANL-YMP-QP-04.6, R2	Procurement	Issued 1/20/95
LANL-YMP-QP-04.6, R3	Procurement	Issued 7/31/95
LANL-YMP-QP-06.2,R4	Preparation, Review, and Approval of QPs	Issued 1/20/95
LANL-YMP-QP-06.4, R0	Exploratory Studies Facility Testing Field Work Packages	Added 10/1/95
LANL-YMP-QP-08.3, R3	Transfer of Data	Issued 9/5/95
LANL-YMP-QP-12.3, R2	Control of Measuring and Test Equipment and Standards	Issued 7/31/95
LANL-YMP-QP-16.2, R4	Trending	Issued 7/31/95
LANL-YMP-QP-16.2, R4	Trending	Deleted 9/28/95
LANL-YMP-QP-16.4, R1	Corrective Action Reports	Deleted 12/21/95
LANL-YMP-QP-17.6, R2	Records Management	Issued 1/20/95
LANL-YMP-QP-17.6, R3	Records Management	Issued 7/31/95
LANL-YMP-QP-17.6, R4	Records Management	Issued 9/28/95
LANL-YMP-QP-18.1, R6	Audits	Deleted 7/31/95
LANL-YMP-QP-18.2, R5	Surveys	Issued 7/31/95
LANL-YMP-QP-18.4, R0	Auditor Qualifications and Lead Auditor Certification	Deleted 7/31/95

Table B-II. Controlled Documents (DPs) Issued in 1995

DETAILED PROCEDURES		
LANL-INC-DP-69, R0	The Operation of Spex Fluorometer Model 222	Deleted 6/26/95
LANL-CST-DP-75, R1	Determination of Particle Size Distribution by Autocorrelation Photon Spectroscopy	Issued 1/26/95
LANL-CST-DP-79, R1	Liquid Scintillation Counting of Samples	Issued 3/31/95
LANL-CST-DP-93, R0	Step-Leaching to Extract Soluble Chloride and Bromide	Issued 6/20/95
LANL-CST-DP-93, R1	Step-Leaching to Extract Soluble Chloride and Bromide	Issued 9/13/95
LANL-CST-DP-101, R0	Colloid Sampling for YMP Studies	Added 8/17/95
LANL-CST-DP-102, R0	Redox Potential (EH) Measurement	Added 9/13/95
LANL-CST-DP-104, R0	Electrical Conductivity of Aqueous Solutions	Added 4/21/95
LANL-CST-DP-105, R0	Extraction of Chloride from Rad-Urine Samples for Cl-36 Analysis	Added 7/31/95
LANL-EES-DP-125, R1	Certification of Standards for Electron Microanalysis	Deleted 6/22/95
LANL-HSE12-DP-301, R1	Field Collection of Experimental Materials	Deleted 7/31/95
LANL-HSE12-DP-302, R0	Cation and Anion Exchange	Deleted 7/31/95
LANL-HSE12-DP-303, R0	Zero Point of Charge (Potentiometric Method)	Deleted 7/31/95
LANL-HSE12-DP-304, R0	Zero Point of Charge (Electrophoresis Method)	Deleted 7/31/95
LANL-HSE12-DP-305, R0	Equilibrium Batch Sorption	Deleted 7/31/95
LANL-HSE12-DP-306, R0	Kinetic Batch Sorption	Deleted 7/31/95
LANL-HSE12-DP-307, R1	Sample Identification and Control	Deleted 7/31/95
LANL-HSE12-DP-310, R1	Calibration and Use of the Phototachometer	Deleted 7/31/95
LANL-HSE12-DP-311, R1	Sample Preparation	Deleted 7/31/95
LANL-HSE12-DP-312, R1	Particle Size Reduction of Geologic Media	Deleted 7/31/95
LANL-HSE12-DP-313, R1	Calibration and Use of Centrifuges	Deleted 7/31/95
LANL-HSE12-DP-314, R0	Electrical Conductivity Measurement	Deleted 7/31/95
LANL-HSE12-DP-315, R0	Calibration and Use of Temperature Measurement and Control Devices	Deleted 7/31/95
LANL-HSE12-DP-318, R1	pH Measurement, Acid-Base Solution Standardization, and Total Alkalinity Determination	Deleted 7/31/95
LANL-HSE12-DP-320, R0	Measurement of Dissolved Oxygen	Deleted 7/31/95
LANL-HSE12-DP-322, R0	Magnetic Separation of Solid Materials	Deleted 7/31/95
LANL-HSE12-DP-323, R0	Spectrophotometric Determination of Constituent Concentrations in Solution	Deleted 7/31/95
LANL-EES-13-DP-609, R2	Balance and Weight Calibration by LANL Standards and Calibration Group	Issued 12/18/95
LANL-EES-13-DP-611, R0	Use of the Garmin GPS 100 for Location of Volcanic Features	Added 4/14/95
LANL-EES-5-DP-701, R0	Light Detection and Ranging (LIDAR) Operations	Added 1/26/95
LANL-EES-5-DP-701, R0	Light Detection and Ranging (LIDAR) Operations	Deleted 9/13/95

Appendix C
Los Alamos Deficiency Database

Appendix C. Los Alamos Deficiency Database

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 YMP data bases 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 in the totals).

Abbreviations	Explanations
CAR 246; R1, 2.3	Internal corrective action report 246. R1 is the version of affected procedure; 2.3 is the section of procedure violated.
YM-CAR-94-011; R1, 2.3	Corrective action report 011, issued by YMP. 94 is the fiscal year (FY94) deficiency was written. R1 & 2.3 is as stated above.
LANL-95-D-001; R1, 2.3	Los Alamos YMP deficiency, issued in 1995. D is for deficiency report (the intermediate deficiency level). R1 & 2.3 as described above.
LANL-95-P-001; R1, 2.3	Los Alamos YMP deficiency, issued in 1995. P is for performance report (the lowest deficiency level). R1 & 2.3 as described above.
AR-94-07-02; R1, 2.3	Los Alamos internal audit 94-07, conducted in 1994. Deficiency #2 was fixed during the audit. R1 and 2.3 as described above.
SR-95-07-03; R1, 2.3	Los Alamos internal survey 95-07, conducted in 1995. Deficiency #3 was fixed during the audit. R1 & 2.3 as described above.
YA-94-08-07; R1, 2.3	YMP audit 94-08, conducted in 1994. Deficiency #7 was fixed during the audit. R1 & 2.3 as described above.
YM-ARC-95-11-01; R1, 2.3	YMP audit 95-11(ARP=performance-based; ARC=compliance), conducted in 1995. Deficiency 01 was fixed during the audit. R1 & 2.3 as described above.

Table C-I. QP-01.3 (Conflict Resolution).

1990-1993 No deficiencies	<u>Total</u> 0
1994 Baseline to QARD, R4 No deficiencies	 0
1995 No deficiencies	0

Table C-II. QP-01.4 (Organization and Quality Program Description).

Procedure initiated in 1994	<u>Total</u>
1994 Baseline to QARD, R4 Issued deficiencies - CAR 246; R1, Att 1, c. Other deficiencies - YA-94-08-04; R1	 1 1
1995 No deficiencies	0

Table C-III. QP-02.5 (Selection of Personnel).

1990-1993 See Bolivar, 1995	<u>Total</u> 28
1994 Baseline to QARD, R4 Issued deficiencies - CAR 246; R3, 9.0, 9.1 Other deficiencies - SR-94-09-01; R1, 6.1.2 SR-94-07-01; R2, 6.3.1	 1 2
1995 No deficiencies	0

Table C-IV. QP-02.7 (Training).

1990-1993 See Bolivar, 1995	<u>Total</u> 35
1994 Baseline to QARD, R4 Issued deficiencies - CAR 246; R3, 9.0, 9.1 Other deficiencies - AR-94-04-01; R3, 6.1 SR-94-10-01; R2, 6.1.1 SR-94-11-01; R2, 2.0	 1 3
1995 Other deficiencies - AR-95-01-01; R3, 6.1	1

Table C-V. QP-02.11 (Orientation).

1990-1993 See Bolivar, 1995	<u>Total</u> 14
1994 Baseline to QARD, R4 Issued deficiencies - CAR 246; R3, 9.0, 9.1	 1
1995 Issued deficiencies - CAR 253; R3, 6.1.4 Other deficiencies - AR-95-02-01; R3, 6.1.4	 1 1

Table C-VI. QP-02.12 (Exemption Control).

Procedure initiated in 1994	<u>Total</u>
1994 Baseline to QARD, R4 No deficiencies	 .0
1995 No deficiencies	 0

Table C-VII. QP-02.15 (Requirements Traceability).

Procedure initiated in 1994	<u>Total</u>
1994 Baseline to QARD, R4 No deficiencies	0
1995 No deficiencies	0

Table C-VIII. QP-03.5 (Scientific Investigations).

<p>1990-1993 See Bolivar, 1995</p>	<p><u>Total</u> 56</p>
<p>1994</p> <p>Baseline to QARD, R4</p> <p>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</p> <p>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</p>	<p>8</p> <p>18</p>
<p>1995</p> <p>Issued deficiencies - CAR 254; R4, 6.1.6</p> <p>Other deficiencies - SR-95-03-01; R4, 6.1.6 AR-95-01-02; R4, 6.1.6, 6.3.2 AR-95-01-03; R4, 6.1.6, 6.3.2 AR-95-02-02; R4, 6.1.6 AR-95-02-03(3); R4, 6.1.8.1 AR-95-06-01; R4, 6.4.1 YM-ARP-95-06-01; R4, 6.1.8</p>	<p>1</p> <p>9</p>

Table C-IX. QP-3.20 (Software Configuration Management).

1991-1993 See Bolivar, 1995	<u>Total</u> 7
1994 Baseline to QARD, R4 No deficiencies	0
1995 No deficiencies	0

Table C-X. QP-03.21 (Software Life Cycle).

1991-1993 See Bolivar, 1995	<u>Total</u> 7
1994 Baseline to QARD, R4 No deficiencies	0
1995 No deficiencies	0

Table C-XI. QP-03.23 (TIPs and Study Plans).

1990-1993 See Bolivar, 1995	<u>Total</u> 30
1994 Baseline to QARD, R4 Issued deficiencies - CAR 239; R1, 6.1, 6.2 Other deficiencies - SR-94-09-07; R1, 6.1.3	 1 1
1995 No deficiencies	0

Table C-XII. QP-03.25 (Review of Design and Test Information).

1990-1993 See Bolivar, 1995	<u>Total</u> 1
1994 Baseline to QARD, R4 No deficiencies	 0

Table C-XIII. QP-03.26 (Software Reviews).

1990-1993 See Bolivar, 1995	<u>Total</u> 8
1994 Baseline to QARD, R4 Issued deficiencies - YM-CAR-94-082; R1, 6.1.2.1.6	1
1995 No deficiencies	0

Table C-XIV. QP-03.27 (Software Documentation).

1990-1993 See Bolivar, 1995	<u>Total</u> 5
1994 Baseline to QARD, R4 No deficiencies	0
1995 No deficiencies	0

Table C-XV. QP-04.6 (Procurement).

1990-1993 See Bolivar, 1995	<u>Total</u> 45
1994 Baseline to QARD, R4 Issued deficiencies - CAR 241; R2, 6.2.2, 6.3 CAR 247 CAR 248 CAR 249 YM-CAR-94-080, R1 Other deficiencies - SR-94-04-01; R0, 6.3.5.2	5 1
1995 Other deficiencies - AR-95-06-03; R1, 6.6.3 AR-95-01-04; R0, 6.1.3	2

Table C-XVI. QP-06.1 (Document Control).

1990-1993 See Bolivar, 1995	<u>Total</u> 19
1994 Baseline to QARD, R4 No deficiencies	0
1995 Issued deficiencies - LANL-95-0-01; R7, 6.3.1, 6.3.2 Other deficiencies - SR-95-03-03; R6, 6.3.2 AR-95-01-05; R7, 6.4.1 SR-95-04-01; R6, 6.3.1, 6.3.2 SR-95-04-02; R6, 6.3.1, 6.3.2 SR-95-04-03; R6, 6.3.1, 6.3.2 YM-ARC-95-11-01; R7, 6.3.1	1 6

Table C-XVII. QP-06.2 (Quality Administrative Procedures).

1990-1993 See Bolivar, 1995	<u>Total</u> 12
1994 Baseline to QARD, R4 Issued deficiencies - CAR 245; R3, 9.1 Other deficiencies - AR-94-04-03; R1, 6.1.1.3 SR-94-13-01(9)	 1 10
1995 No deficiencies	0

Table C-XVIII. QP-06.3 (Detailed Technical Procedures).

1990-1993 See Bolivar, 1995	<u>Total</u> 10
1994 Baseline to QARD, R4 Issued deficiencies - CAR 245; R2, 9.1 Other deficiencies - SR-94-13-01(21); R0	 1 21
1995 No deficiencies	0

Table C-XIX. QP-08.1 (Samples).

1990-1993 See Bolivar, 1995	<u>Total</u> 6
1994 Baseline to QARD, R4 Issued deficiencies - CAR-244; R3, 6.5.3 CAR-250; R3 Other deficiencies - YA-94-08-03; R4, 6.1.1.1	 2 1
1995 Other deficiencies - SR-95-03-02; R4, 6.4.3 AR-95-06-02; R4, 6.4.4	 2

Table C-XX. QP-08.3 (Data).

1990-1993 See Bolivar, 1995	<u>Total</u> 3
1994 Baseline to QARD, R4 Issued deficiencies - CAR 240, R2; 6.4.5 YM-CAR-94-083 Other deficiencies - AR-94-05-08; R3	 2 1
1995 Other deficiencies - AR-95-05-01; R2, 6.3.3.4	 1

Table C-XXI. QP-12.3 (M&TE).

1990-1993 See Bolivar, 1995	<u>Total</u> 38
1994 Baseline to QARD, R4	
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
1995	
Issued deficiencies - CAR 255; R1, 6.7.2 LANL-95-D-02; R2, 6.6.2.6 CAR 252; R2, 6.6.2.6	3
Other deficiencies - SR-95-02-01; R1, 6.4.7, 6.4.8 YM-ARC-95-11-02; R1, 6.3.2 YM-ARC-95-11-03; R1, 6.3.2	3

Table C-XXII. QP-17.6 (Records).

1990-1993 Issued deficiencies - See Bolivar, 1995	<u>Total</u> 52
1994 Baseline to QARD, R0	
Issued deficiencies - YM-CAR-94-078	1
Other deficiencies - SR-94-01-01; R0, Att. 2	1
1995	
Issued deficiencies - CAR 256; 17.6, R2, 6.13.2-.4	1

Table C-XXIII. QP-18.2 (Surveys).

1990-1993 See Bolivar, 1995	<u>Total</u> 5
1994 Baseline to QARD, R4 No deficiencies	 0
1995 No deficiencies	0

Table C-XXIV. DPs (Detailed Technical Procedures).

1990-1993 See Bolivar, 1996	<u>Total</u> 22
1994 Baseline to QARD, R4 Issued deficiencies - YM-CAR-94-079; DP 35, R2, 6.2.2 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	 1 30
1995 No deficiencies	0

Table C-XXV. QARD.

1994		<u>Total</u>
	Baseline to R4	
	No deficiencies	0

1995		
	R5 issued (10-2-95)	0