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THE QUALITY ASSURANCE LIAISON: COMBINED TECHNICAL AND QUALITY ASSURANCE SUPPORT

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Abstract

This paper describes the role of the quality assurance liaison, the responsibilities of this position, and the evolutionary changes in duties over the last six years. The role of the quality assurance liaison has had a very positive impact on the Los Alamos Yucca Mountain Site Characterization (YMP) quality assurance program. Having both technical and quality assurance expertise, the quality assurance liaisons are able to facilitate communications with scientists on quality assurance issues and requirements, thereby generating greater productivity in scientific investigations. The quality assurance liaisons help ensure that the scientific community knows and implements existing requirements, is aware of new or changing regulations, and is able to conduct scientific work within Project requirements.

The influence of the role of the quality assurance liaison can be measured by an overall improvement in attitude of the staff regarding quality assurance requirements and improved job performance, as well as a decrease in deficiencies identified during both internal and external audits and surveillances. This has resulted in a more effective implementation of quality assurance requirements.

INTRODUCTION

In December 1987, the U. S. Congress amended the Nuclear Waste Policy Act of 1982 directing the U. S. Department of Energy (DOE) to perform intensive scientific studies, or "site characterization," of Yucca Mountain, Nevada, as the only potential site under consideration for the safe, permanent underground storage of high-level nuclear waste.(1) DOE contracted several participants, including the Los Alamos National Laboratory (Los Alamos), to perform the site characterization, which includes the assessment of geologic and environmental suitability of Yucca Mountain as well as research into a variety of social and economic questions about a repository's effect on the quality of life in nearby communities.(2) Because the repository may pose potential risks to the environment and the safety of human beings, site characterization must be performed in accordance with strict quality assurance (QA) requirements as prescribed in documents specified by the U. S. Nuclear Regulatory Commission, DOE, and the Office of Civilian Radioactive Waste Management. DOE directed each participant to develop and implement its own QA program to fulfill DOE's QA requirements applicable to the site characterizations to be performed (3) on what is now referred to as the "Yucca Mountain Site Characterization Project" (YMP).

Los Alamos initially hired subcontractors to develop its QA program. Unfortunately, there was inadequate implementation of the Los Alamos YMP QA program, primarily because of little or no direct involvement of the Project's scientists. Los Alamos YMP management determined that the scientists must be directly involved in integrating the concepts of the QA program into the scientific investigations processes. Management also recognized that the DOE-required QA implementation could not be accomplished as long as the QA organization and the scientists remained separate organizational entities with little direct interaction or cooperation. Los Alamos YMP decided to train selected scientists in QA requirements so they could become liaisons between the QA organization and the scientific community. These individuals are today Los Alamos YMP Quality Assurance Liaisons.

The position of QA Liaison has evolved significantly since its inception as to duties, responsibilities, and assignments within the Los Alamos YMP organization. Its goals, however, remain the same: to continually learn QA concepts, to develop a better understanding of how to integrate QA concepts into scientific investigation processes, and to help other scientists with these tasks. Although the success or failure of any QA program depends upon a variety of factors, the work of the QA Liaisons has contributed significantly to the overall improvements in the Los Alamos QA program and its subsequent acceptance by the DOE in 1990.

DEVELOPMENTAL HISTORY OF THE QA LIAISON FUNCTION

Pre-1990

In the pre-1990 time frame, particularly 1986-1987, subcontract personnel were hired to assist in developing and implementing a QA program for the Los Alamos YMP. The subcontractors reported directly to the Quality Assurance Project Leader (QAPL) (Figure 1). This arrangement had a number of drawbacks: the subcontractors did not fully understand how the Los Alamos YMP was organized or how work was to be performed; the scientists were overwhelmed with QA requirements they did not understand or support; and poor communications between the subcontractors and scientists impeded work.

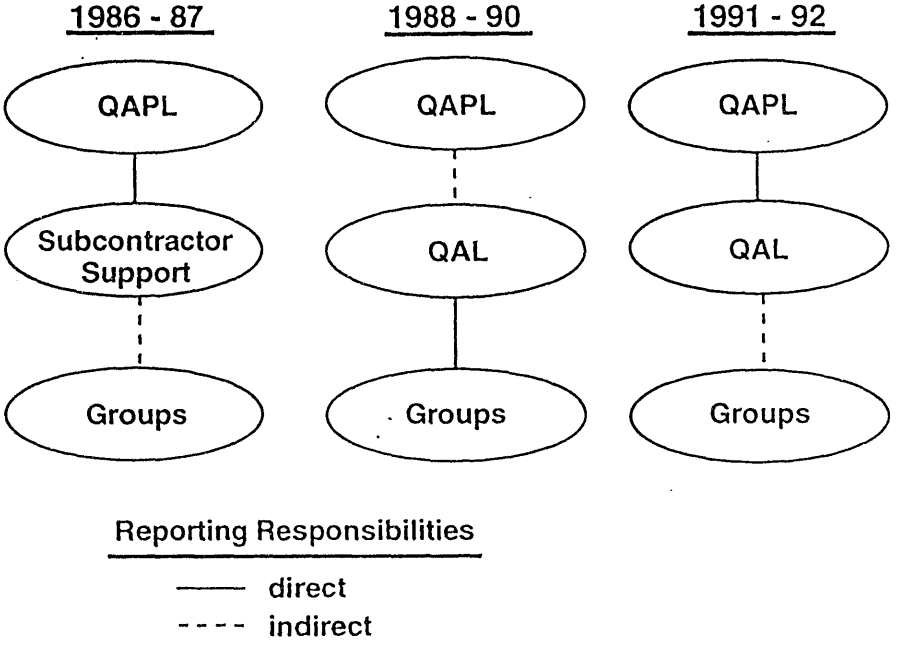

Figure 1. Programmatic reporting responsibilities.

The subcontractors were assigned to write quality administrative procedures that define support activities for Project scientific investigations. Because the scientists were not involved in writing, reviewing, and approving these procedures, the procedures failed to reflect how support activities were to be performed. This was, therefore, a period not only in which substantive changes were introduced into the ways scientists conducted their work, but also one in which an atmosphere of antagonism developed between subcontracts and scientists because of a basic lack of understanding and awareness of each other's roles and needs.

In 1988 Los Alamos YMP management replaced the subcontractors in key positions with QA Liaisons as a means of correcting the problems existing between the scientists and the QA organization. The first QA Liaisons were selected from the technical ranks. They performed, concurrently, technical work on the YMP and QA duties. The strengths of the QA Liaisons were their understanding of their groups' positions and approaches on technical issues and their proactive implementation of QA requirements. Their primary weakness, however, was a lack of formal QA experience because they were first and foremost technical members of the Los Alamos YMP. To strengthen the QA Liaisons skills and experience base in QA concepts, the Los Alamos YMP management instituted an intensive training program with an on-the-job component utilizing the subcontractors' extensive QA expertise.

1990-Present

A DOE audit finding on the Los Alamos YMP in 1990 required a separation of responsibilities for the QA Liaisons. The QA Liaisons today report programmatically to the QAPL, and they no longer conduct technical work on the YMP. This ensures the independence of the QA Liaisons and eliminates potential conflicts of interest during the performance QA activities.

The QA Liaisons continue to be selected from technical groups they ultimately will represent or on the basis of their combined technical and QA experience. The individuals chosen for these positions must clearly understand the technical aspect of the working group and have a willingness to implement the QA requirements. Today, however, the most important hiring factor is the willingness to work with the QA requirements and assist the scientists in successfully implementing necessary changes.

Initially, QA Liaisons worked full time on the Los Alamos YMP. Recently, the QA Liaisons' time commitments for the Los Alamos YMP were reduced. This reduction can be attributed to two factors. First, some people get frustrated with the intense documentation requirements of the YMP. They simply burn out. Second, the scientific community has now been exposed to the YMP quality requirements for several years and a culture change has begun. The requirements are better understood and implemented by the Project scientists. A QA Liaison may, consequently, assist more than one working group. This, of course, requires that the respective QA Liaison has a much broader technical knowledge than would be needed if only one group were supported. Eventually the current six QA Liaison positions will be handled by three or four individuals.

Finally, there is one potential risk to the role of a QA Liaison when actively helping scientists with QA requirements. Normal duties include assisting scientists with procurement documents and maintaining a training database that investigators can use to monitor training. Although the role is to assist, sometimes the QA Liaison

is put into the position of doing the work for the scientists. For example, another typical duty of a QA Liaison might be to help a scientist with the correct wording of a deficiency report, but the QA Liaison should not write the report for the scientist. This is a common pitfall. When it happens, both the scientist and the QA Liaison suffer: the scientist does not learn how to correct the deficiency, and the QA Liaison loses time that might be spent with other duties.

LOS ALAMOS YMP ORGANIZATION

A brief look at the management structure of the Los Alamos YMP will put the QA Liaison position into better perspective. The Los Alamos YMP is led by a Technical Project Officer, who is assisted by four Project Leaders (Figure 2), who are responsible for respective aspects of the Project. Some QA Liaisons report administratively to Los Alamos line management in their specific groups but programmatically to the QAPL on the Los Alamos YMP while others report both administratively and programmatically to the QAPL. This latter management structure is preferable because the QAPL can more effectively mange the assignments and time of the QA Liaisons.

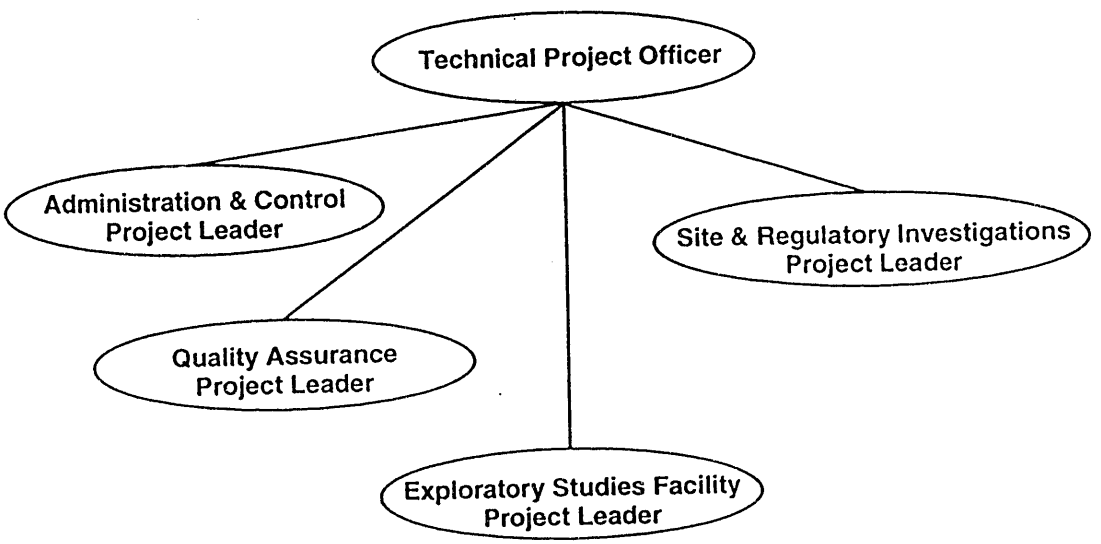

Figure 2. Technical Project Officer and Project Leaders.

Project Leaders coordinate several functions. The QAPL is responsible for verification activities, including audits and surveys, and the Administration and Control Project Leader (ACPL) is responsible for budgeting and office support functions. Although the functions coordinated by the ACPL are independent of the QA organization (i.e., do not report to the QAPL), personnel performing these activities and the QA organization staff must interact daily for the overall QA program to run smoothly. For example, a QA Liaison reports to the QAPL while a Resident File Custodian (RFC) reports to the ACPL. The RFC maintains a dual storage facility for Los Alamos YMP records as required by QA documents while the QA Liaison assists the project scientists in duplicating records and transferring them to the RFC for storage. The smooth and affective interaction for this and other types of day-to-day activities between the QA Liaison, project scientists, RFC, and staff is very important to the success of the Los Alamos YMP.

QA LIAISON DUTIES AND RESPONSIBILITIES

The QA Liaisons' duties and responsibilities continue to evolve in order that they can remain abreast of Los Alamos YMP needs. For example, upon approval by DOE of the Los Alamos YMP QA software plan and implementing procedures, the QA Liaisons were assigned to assist the Project scientists with the implementation of the procedural guidelines. All QA Liaisons are currently responsible for the following:

- coordinating and hosting internal and external surveys and audits,
- assisting in the preparation of responses to survey and audit findings,
- preparing quality implementing procedures (QP),
- reviewing QPs and detailed technical procedures (DP) for understanding,
- reviewing purchase requests to assure that appropriate QA requirements are incorporated in the specifications,
- identifying measurement and test equipment (M&TE) to be placed under calibration control,
- reviewing QA records for accuracy and completeness,
- assisting Principal Investigators with training and training records,
- assisting Principal Investigators with software qualification needs, and
- assisting the QAPL in all quality-related matters.

QA Liaisons are also assigned other duties on an individual basis including serving as a member of special committees or task forces that support the Los Alamos YMP QA program; identifying to the QAPL any quality related issues that may effect technical, administrative, or management efforts; and knowing and interpreting QA requirements for the technical staff in the organizations for which they perform liaison duties. These assignments are based on the individual QA Liaisons expertise. For example, a QA Liaison in a software development group needs extensive computer expertise, but probably very little field experience. This individual, therefore, may also be assigned an additional task outside the group such as serving on a software configuration control board.

QA LIAISON ACCOMPLISHMENTS

The role of the QA Liaison has a positive impact on the Los Alamos YMP QA program. Scientists are conducting research, but they must also be aware of changing programmatic guidelines, attend Project functions, and be knowledgeable of existing (and changing) QA requirements. The QA Liaisons are able to assume a part of this responsibility by facilitating communications with the scientists on QA issues and requirements, thereby generating greater productivity in scientific investigations. The QA Liaisons help ensure that the scientific community knows and implements existing requirements, is aware of new or changing requirements, and is able to conduct scientific work with Project requirements. The support of the QA Liaisons and their facility with project QA requirements have resulted in enhanced, more positive attitudes among the scientists toward the QA program and their effective, conscientious implementation of the QA requirements.

DOE audits and other verification activities in 1987 identified 28 program deficiencies. Since that time, the yearly total of Los Alamos QA program deficiencies identified by DOE has steadily decreased, with only one identified in 1991 (Figure 3), clearly indicating the overall Project job performance improvements. Over the years the scientific community has become better adapted to the quality assurance regulations, consequently fewer deficiencies occur. This is, however, in large part because the QA Liaisons have identified requirements for the scientists and assisted them in appropriate, effective implementation. The scientists now know the QA program much better and, therefore, implement it more effectively with the result being fewer and fewer DOE program deficiencies. The QA Liaisons are a critical element in the document success and effectiveness of the Los Alamos QA program over the last few years.

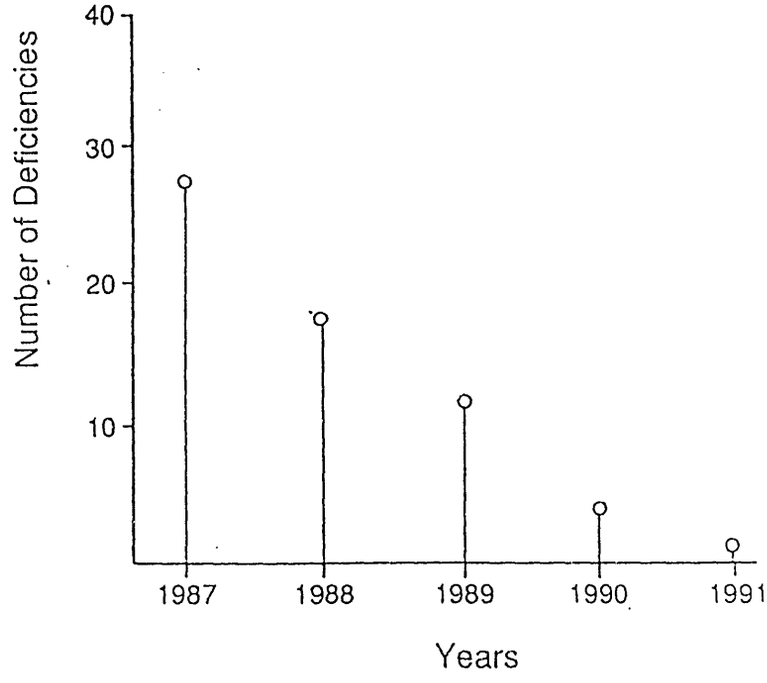

Figure 3. Deficiencies issued by DOE on the Los Alamos YMP, 1987-1991.

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