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Sargent & Lundy Nuclear Quality Assurance Program
Topical Report SL-TR-1A, Revision 16 Transmittal

United States Regulatory Commission
Document Control Desk
Washington, DC 20555

Gentlemen:

In accordance with 10 CFR 50.4 (b)(7)(ii), enclosed is a signed copy of Revision 16 of our Nuclear Quality Assurance Program. This revision was accepted in a letter from Mr. Stephen Dembek of the NRC to me dated March 1, 2002.

Yours very truly,



R. L. Kurtz
Quality Assurance Manager

RLK:RPS:mt
Enclosure
Copy:
P. L. Wattelet (1/0)

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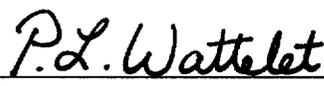
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SARGENT & LUNDY LLC
NUCLEAR QUALITY ASSURANCE PROGRAM
TOPICAL REPORT
SL-TR-1A

APPROVED
BY:



R. L. KURTZ
QUALITY ASSURANCE MANAGER



P. L. WATTELET
CHIEF EXECUTIVE OFFICER

1 00.00 INTRODUCTION

2 This Sargent & Lundy LLC (S&L) Nuclear Quality Assurance
3 Program was established by management policy. It is intended
4 to be used primarily to assure the quality of modifications
5 and design analyses for operating nuclear plants *and gaseous*
6 *diffusion plants*, and of the design and construction of
7 radioactive material packaging and of independent spent fuel
8 storage installations (ISFSIs). It is, however, written to
9 also assure the quality of design analyses and modifications
10 for nuclear plants that are under construction or are being
11 decommissioned. The program is employed where the
12 structures, systems and/or components are classified as
13 important to safety insofar as they prevent or mitigate the
14 consequences of postulated accidents that could cause undue
15 risk to the health and safety of the public. Safety-related
16 structures, systems and components of nuclear power plants
17 controlled by this Quality Assurance Program are identified
18 in the Safety Analysis Report (usually Section 3.2) and in
19 more detailed lists developed in response to NRC Generic
20 Letter 83-28. Quality assurance commitments for other types
21 of important to safety items, as found in licensees' or U.S.
22 Department of Energy contractors' quality assurance programs
23 and other licensing basis documents, are specified to S&L in
24 contract documents. Project instructions or project work
25 plans shall delineate the applicability of this program to
26 these other types of items.

27 The applicable criteria in this program shall be applied in
28 a graded approach to radioactive material packaging and
29 ISFSIs. The application shall be to an extent that is
30 commensurate with the importance to safety, such as

1 described in Appendix A of Regulatory Guide 7.10 (see items
2 in this chapter), or its equivalent for ISFSIs, such as the
3 classification system described in NUREG/CR-6407 titled
4 "Classification of Transportation Packaging and Dry Spent
5 Fuel Storage System Components According to Importance to
6 Safety."

7 *The applicable criteria in this program shall be applied in*
8 *a graded approach to operating gaseous diffusion plants to*
9 *an extent that is commensurate with the importance to safety*
10 *and is consistent with the quality assurance program*
11 *implemented by the United States Enrichment Corporation*
12 *(USEC), or its successor, in accordance with 10 CFR 76.93.*

13 To implement the program, standard operating procedures have
14 been prepared. Revisions to the Nuclear Quality Assurance
15 Program and the standard operating procedures will be made,
16 in accordance with a standard operating procedure, for any
17 of the following reasons:

- 18 a. the program or standard operating procedures may be
19 incomplete, unclear or incorrect;
- 20 b. the resolution of a nonconformance may require change to
21 some portion of the program or standard operating
22 procedures;
- 23 c. the personnel implementing or auditing the program or
24 standard operating procedures determine that the program
25 and/or procedures do not effectively control a work
26 function;

1 d. the standards, codes, regulatory requirements, or
2 organization may be changed.

3 S&L policy makes compliance with the S&L Nuclear Quality
4 Assurance Program and implementing procedures mandatory for
5 all personnel performing activities relating to safety.

6 For limited scope projects, such as modification work for
7 operating plants, implementation of various elements of this
8 Nuclear Quality Assurance Program will depend on S&L's
9 assigned responsibilities on the project.

10 The S&L Nuclear Quality Assurance Program, as represented
11 herein, complies with Title 10 of the Code of Federal
12 Regulations, Part 50, Appendix B, titled "Quality Assurance
13 Criteria for Nuclear Power Plants and Fuel Reprocessing
14 Plants." S&L is committed to meeting and implementing the
15 applicable provisions of the following requirements except
16 as indicated below and/or as these provisions may be
17 modified by a commitment in an applicable SAR:

18 a. ANSI/ANS-3.1 - 1987 - Selection, Qualification and
19 Training of Personnel for Nuclear Power Plants. For
20 qualifications of the Quality Assurance Manager, S&L is
21 committed to ANSI/ANS-3.1 - 1978.

22 b. Regulatory Guide 1.26, February, 1976 - Quality Group
23 Classification and Standards for Water-, Steam-, and
24 Radioactive-Waste-Containing Components of Nuclear Power
25 Plants.

1 c. Regulatory Guide 1.28, February, 1979 - Quality
2 Assurance Program Requirements (Design and Construction)
3 (ANSI/ASME N45.2 - Quality Assurance Program
4 Requirements for Nuclear Facilities).

5 If the quality assurance program of a potential supplier
6 is based on ANSI/ASME NQA-1, the evaluation of the
7 supplier's program, in accordance with Section 07.01,
8 shall include an evaluation of compliance with the
9 applicable criteria of Regulatory Guide 1.28, August,
10 1985 (ANSI/ASME NQA-1 - Quality Assurance Requirements
11 for Nuclear Facility Applications).

12 For design activities for which Section III of the ASME
13 Boiler and Pressure Vessel Code permits a supplier not
14 accredited by ASME to perform these activities, the
15 evaluation of the supplier's program shall include an
16 evaluation of compliance with Appendix B to 10 CFR 50.

17 d. Regulatory Guide 1.29, September 1978 - Seismic Design
18 Classification.

19 e. Regulatory Guide 1.58, September 1980 - Qualification of
20 Nuclear Power Plant Inspection, Examination, and Testing
21 Personnel; (ANSI/ASME N45.2.6 - Qualifications of
22 Inspection, Examination, and Testing Personnel for
23 Nuclear Power Plants).

24 The QA experience cited for Level I, II and III should
25 be interpreted to mean actual experience in carrying out
26 the types of inspection, examination or testing activity
27 being performed.

1 f. Regulatory Guide 1.64, Revision 2, June 1976 - Quality
2 Assurance Requirements for the Design of Nuclear Power
3 Plants; (ANSI N45.2.11 - Quality Assurance Requirements
4 for the Design of Nuclear Power Plants). S&L takes
5 exception to Regulatory Position 2 regarding design
6 verification reviews. Refer to S&L position in Section
7 03.04.

8 g. Regulatory Guide 1.74, February 1974 - Quality Assurance
9 Terms and Definitions; (ANSI N45.2.10 - Quality
10 Assurance Terms and Definitions). S&L deviates from
11 these documents in the following definitions:

12 (1) Certification - the act of determining, verifying,
13 and attesting in writing to the qualifications of
14 personnel, processes, procedures, or items in
15 accordance with specified requirements.

16 (2) Inspection - examination or measurement to verify
17 whether an item or activity conforms to specified
18 requirements.

19 (3) Surveillance - the act of monitoring or observing
20 to verify whether an item or activity conforms to
21 specified requirements.

22 (4) Testing - an element of verification for the
23 determination of the capability of an item to meet
24 specified requirements by subjecting the item to a
25 set of physical, chemical, environmental, or
26 operating conditions.

- 1 h. Regulatory Guide 1.88, Revision 2, October 1976 -
2 Collection, Storage, and Maintenance of Nuclear Power
3 Plant Quality Assurance Records; (ANSI N45.2.9 -
4 Requirements for Collection, Storage, and Maintenance of
5 Quality Assurance Records for Nuclear Power Plants). S&L
6 takes exception to the four-hour minimum fire-rating
7 requirement for a single record storage facility. Refer
8 to S&L position in Section 17.03.
- 9 i. Regulatory Guide 1.116, May 1977 - Quality Assurance
10 Requirements for Installation, Inspection, and Testing
11 of Mechanical Equipment and Systems (ANSI N45.2.8 -
12 Supplementary Quality Assurance Requirements for
13 Installation, Inspection and Testing of Mechanical
14 Equipment and Systems for the Construction Phase of
15 Nuclear Power Plants).
- 16 j. Regulatory Guide 1.123, July 1977 - Quality Assurance
17 Requirements for Control of Procurement of Items and
18 Services for Nuclear Power Plants; (ANSI N45.2.13 -
19 Quality Assurance Requirements for Control of
20 Procurement of Items and Services for Nuclear Power
21 Plants).
- 22 k. Regulatory Guide 1.127, Revision 1, March 1978 -
23 Inspection of Water-Control Structures Associated with
24 Nuclear Power Plants.
- 25 l. Regulatory Guide 1.144, September 1980 - Auditing of
26 Quality Assurance Programs for Nuclear Power Plants;
27 (ANSI/ASME N45.2.12 -Requirements for Auditing of
28 Quality Assurance Programs for Nuclear Power Plants).

1 For certain activities, S&L takes exception to
2 Regulatory Position C.3.b(1) regarding external audits.
3 Refer to position in Section 07.03.

- 4 m. Regulatory Guide 1.146, August 1980 - Qualification of
5 Quality Assurance Program Audit Personnel for Nuclear
6 Power Plants; (ANSI/ASME N45.2.23 - Qualification of
7 Quality Assurance Program Audit Personnel for Nuclear
8 Power Plants).
- 9 n. ANSI/ASME N45.2.5-1978 - Supplementary Quality Assurance
10 Requirements for Installation, Inspection, and Testing
11 of Structural Concrete, Structural Steel, Soils and
12 Foundations During the Construction Phase of Nuclear
13 Power Plants.
- 14 o. IEEE Standard 336-1977 - IEEE Standard Installation,
15 Inspection, and Testing Requirements for Instrumentation
16 and Electric Equipment During the Construction of
17 Nuclear Power Generating Stations.
- 18 p. NRC Letter to All Licensees of Operating Reactors and
19 Holders of Construction Permits, "Plant Record Storage
20 on Optical Disks (Generic Letter 88-18)", October 20,
21 1988.
- 22 q. *NRC Regulatory Issue Summary 2000-18, Guidance on*
23 *Managing Quality Assurance Records in Electronic Media,"*
24 *October 23, 2000. S&L uses the guidance in this summary*
25 *for authentication of electronic records, i.e., the*
26 *guidance in Nuclear Information and Records Management*
27 *Association, Inc. (NIRMA) Technical Guide 11-1998,*

1 "Authentication of records and Media." See Chapter
2 17.00 for further details.

3 r. NRC Letter to All Holders of Operating Licensees and
4 Construction Permits for Nuclear Power Reactors,
5 "Actions to Improve the Detection of Counterfeit and
6 Fraudulently Marketed Products (Generic Letter 89-02),
7 March 21, 1989.

8 s. NRC Letter to All Holders of Operating Licenses and
9 Construction Permits for Nuclear Power Reactors,
10 "Licensee Commercial-Grade Procurement and Dedication
11 Programs (Generic Letter 91-05), April 9, 1991.

12 t. Regulatory Guide 7.10, June 1986 - Establishing Quality
13 Assurance Programs for Packaging Used in the Transport
14 of Radioactive Material.

15 The Topical Report is reviewed annually for continuing
16 conformance to regulatory requirements and industry codes
17 and standards. Changes in the Topical Report are submitted
18 to the Nuclear Regulatory Commission in accordance with 10
19 CFR 50.4 (b) (7) (ii). Any reductions in commitments to the
20 NRC contained in this Topical Report must be accepted by the
21 NRC before implementation. Changes to this Topical Report
22 that do not reduce commitments may be implemented prior to
23 NRC review. The examples given in 10 CFR 50.54 (a) (3) of
24 changes in licensees' QA program descriptions, that do not
25 require prior NRC approval, are also applicable to this
26 Topical Report. Those changes, that do not require prior
27 NRC approval, must be submitted to the NRC at intervals of
28 no greater than two years.

1 01.00 ORGANIZATION

2 01.01 S&L organizational structure and functional responsibility
3 assignments are based on the recognition of quality
4 assurance as an inter-disciplinary process with quality-
5 related activities being performed by individuals at all
6 levels. The responsibilities of persons implementing
7 quality-related requirements are established, assigned, and
8 documented. Assignments are such that:

- 9 a. attainment of quality objectives is accomplished by
10 individuals assigned responsibility for specifying
11 quality or performing work to quality assurance
12 procedures;
- 13 b. verification of conformance to established quality
14 requirements is accomplished by project personnel who
15 are independent of those responsible for establishing or
16 performing the activity;
- 17 c. personnel performing key quality assurance functions
18 have direct access to management.

19 S&L's management organizational structure is shown in Figure
20 01.01-1, Sargent & Lundy Management Organization Chart.
21 Company services are organized into business groups and
22 functional support groups. The business groups are Nuclear
23 Power Technologies and other business groups as determined
24 by the Chief Executive Officer. The functional support
25 groups are Engineering and Finance & Administration. The
26 Chief Executive Officer exercises administrative control
27 over the Directors of business groups, as well as the
28 Director of Engineering and the Director of Finance &

1 Administration. Although the individual groups are distinct
2 entities, the management and execution of their respective
3 functions and responsibilities may involve staff sharing
4 with other groups.

5 The Director of the Nuclear Power Technologies business
6 group oversees nuclear services provided for operating and
7 decommissioning plants and other specialized projects.

8 In a similar fashion, the Directors of the other business
9 groups oversee services provided within their areas of
10 responsibilities.

11 The Director of Engineering exercises administrative control
12 over the *Project Services and Plant Support Services*
13 Departments.

14 The Director of Finance & Administration exercises
15 administrative control over the Managers of the
16 Administrative Services, Facilities & Operations, and Human
17 Resources Divisions. The Facilities & Operations Division
18 is responsible for the configuration control of computer
19 software used in production, including the review and filing
20 of software verification and validation documentation.

21 The Quality Assurance Manager reports to the Chief Executive
22 Officer.

23 Personnel from the Director of Engineering's staff and the
24 appropriate support services divisions in the Finance &
25 Administration Group normally report to the Directors of
26 these two functional support groups. However, some
27 personnel from these two groups may be temporarily assigned

1 to projects controlled by a Director of a business group, as
2 required, to perform the necessary technical and
3 administrative functions pertaining to design engineering,
4 procurement, and inspection. The Director of Engineering is
5 responsible for establishing processes, methods and
6 techniques for achieving technical objectives. The Director
7 of a business group has overall responsibility for the
8 technical adequacy and acceptability of S&L nuclear design
9 work within the responsibility of the group, and for
10 providing feedback to the Director of Engineering on the
11 effectiveness of the engineering processes, methods, and
12 techniques.

13 Project Instructions and governing company standards are
14 established to control quality-related activities. These
15 instructions and company standards are reviewed by Quality
16 Assurance for conformance to this program's requirements
17 before issuance.

18 Within a business group, a project organization is
19 established for each project in which S&L has essentially
20 all the engineering responsibility and for services projects
21 (or tasks) for units under construction, in operation or in
22 decommissioning which may have been engineered by others.
23 The size and composition of the project organization is
24 dependent on the project responsibilities as delineated by
25 the project scope of work. Since S&L serves a wide variety
26 of clients with different service requirements, different
27 project organizations may be established to best accommodate
28 the scope of work.

29 For each project, the project organization is comprised of
30 qualified individuals. In cases where an onsite design

1 engineering and/or services project organization is required
2 and falls under the cognizance of the QA Program,
3 organizational charts, functional descriptions of
4 responsibilities and relationships, job descriptions of key
5 personnel positions, or equivalent forms of documentation
6 are prepared showing the lines of responsibility.
7 Delegation of authority passes from the responsible Director
8 of a business group and Project Director through the Project
9 Manager to Senior Project Engineers and responsible
10 engineers and consultants.

11 The responsibility for implementation of the S&L Quality
12 Assurance Program on a project is assigned to the Project
13 Manager. The project team provides the S&L interface with
14 the client and major contractors, and establishes the
15 technical requirements on the project to assure compliance
16 with applicable codes, standards, and regulations. In
17 project matters, the Senior Project Engineers report to the
18 Project Manager, who reports to the Project Director, who
19 represents S&L management on the project.

20 Interfacing relationships and lines of communication among
21 S&L, the client, vendors, and major contractors on a project
22 are established by and/or described in documents such as,
23 but not limited to, the scope of work, the project work
24 plan, procurement documents, and project instructions.
25 Internal interfaces within S&L are established in company
26 standards and procedures, project instructions, and quality
27 assurance procedures.

1 The Chief Executive Officer establishes quality assurance
2 policy and objectives. The Chief Executive Officer has
3 delegated to the Quality Assurance Manager responsibility
4 for providing and maintaining the Quality Assurance Program,
5 for providing programmatic policy and direction on quality
6 assurance, and for coordinating and verifying its
7 implementation on projects.

8 01.02 Quality Assurance, as indicated in Figure 01.01-1, S&L
9 Management Organization Chart, is independent of any S&L
10 project organization. The Quality Assurance Manager has the
11 authority and organizational freedom to identify quality
12 problems within S&L, recommend or provide solutions and
13 verify their implementation, and to stop unsatisfactory work
14 or otherwise control further processing of a nonconforming
15 item until the proper disposition of the unsatisfactory
16 condition has been achieved. S&L personnel are required to
17 bring to the attention of the Quality Assurance Manager
18 conditions which may merit stop-work consideration. The
19 Quality Assurance Manager provides expertise as applicable
20 in interpretation of quality assurance requirements in codes
21 and standards, in regulations, in NRC Regulatory Guides and
22 in the Quality Assurance Articles, Section III, Nuclear
23 Power Plant Components, ASME Boiler and Pressure Vessel
24 Code.

25 The responsibilities and functions of the Quality Assurance
26 Manager include, but are not limited to:

- 27 a. developing for management approval by the Chief
28 Executive Officer standard operating procedures
29 necessary for implementation of the program;

- 1 b. recommending to the Chief Executive Officer desirable
2 changes in the Nuclear Quality Assurance Program;
- 3 c. reviewing procedure, administrative standards and
4 instructions prepared by groups, departments, divisions,
5 and project organizations for conformance to the Nuclear
6 Quality Assurance Program and procedure requirements;
- 7 d. interfacing with clients and the Nuclear Regulatory
8 Commission on audits and quality assurance matters;
- 9 e. interfacing with project organizations and support
10 divisions to assist in the implementation of quality
11 assurance requirements on a project;
- 12 f. maintaining and controlling the distribution of the
13 Nuclear Quality Assurance Manual and revisions thereto;
- 14 g. training and instructing S&L personnel performing
15 quality-related activities in the implementation of the
16 Nuclear Quality Assurance Program and standard operating
17 procedures;
- 18 h. developing and conducting audits and surveillance on
19 design, procurement and other activities of S&L
20 personnel assigned to the home office and to the field;
- 21 i. providing quality assurance input in S&L procurement
22 documents;
- 23 j. reviewing, evaluating and reporting on S&L suppliers'
24 quality assurance programs and/or procedures;

- 1 k. certain types of inspection as specified in Section
2 10.00 of the Program and in implementing procedures;

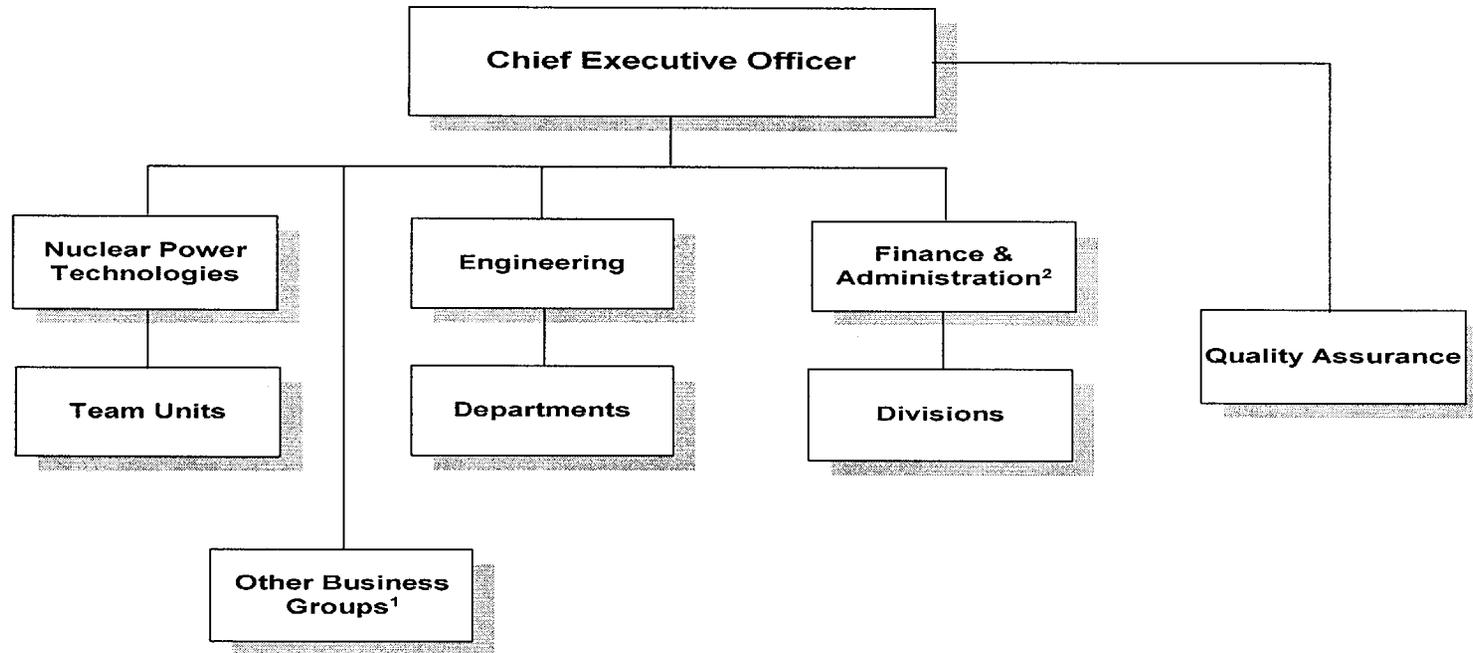
- 3 l. audit and surveillance of suppliers' compliance to their
4 approved quality assurance programs;

- 5 m. providing direct quality assurance services as
6 requested by clients, including such services as
7 preparation of QA programs and procedures, auditing and
8 surveillance of the client's organization and its
9 suppliers, and training of client personnel in quality
10 assurance activities;

- 11 n. furnishing qualified personnel to clients for assistance
12 in quality-related activities.

13 When responsible for procurement, S&L delegates, or a client
14 may delegate to the Quality Assurance Manager, authority to
15 identify supplier quality control problems and to stop
16 unsatisfactory work or otherwise control further processing
17 of an item by a supplier.

Sargent & Lundy Management Organization Chart
Figure 01.01-1



¹Other Business Groups and their area of responsibility are determined by the Chief Executive Officer.

²Configuration control of computer software used in production, including review and filing of software verification and validation documents, is the responsibility of the Finance & Administration functional support group.

1 02.00 QUALITY ASSURANCE PROGRAM

2 02.01 This Quality Assurance Program has been established in
3 accordance with the requirements of 10 CFR Part 50, Appendix
4 B. During the preparation of the Program and the standard
5 operating procedures, steps are taken to verify that the S&L
6 Nuclear Quality Assurance Program and procedures responds to
7 each of the applicable criteria of 10 CFR Part 50, Appendix
8 B, Quality Assurance Criteria for Nuclear Power Plants; 10
9 CFR 71, Subpart H, Quality Assurance; 10 CFR 72, Subpart G,
10 Quality Assurance; and to the requirements of the applicable
11 Regulatory Guides, and ANSI/ASME Standards referenced in
12 Section 00.00, Introduction (except as noted therein). NRC
13 Regulatory Guides are reviewed for suitability and used as
14 appropriate for S&L activities.

15 Those responsible for defining the content of the Nuclear
16 Quality Assurance Program are the Chief Executive Officer
17 and the Quality Assurance Manager. The Quality Assurance
18 Manager is responsible for approval of this Quality
19 Assurance Program and implementing procedures. The Chief
20 Executive Officer provides senior management approval of
21 this Quality Assurance Program and the standard operating
22 procedures.

23 The Nuclear Quality Assurance Program is made available to
24 personnel responsible for quality-related work through
25 controlled distribution in accordance with a standard
26 operating procedure.

1 Since this program is included in the document control
2 system, S&L personnel who receive the program electronically
3 are provided with a master list so that they can verify that
4 they are working with the current issue of the program. S&L
5 personnel and other organizations who receive controlled
6 hard copies of this program are required to acknowledge
7 receipt of the program and revisions.

8 To implement the Nuclear Quality Assurance Program and
9 comply with the standard operating procedures, the Director
10 of Engineering, Department/Division Managers and Project
11 Managers establish standards, procedures, and instructions
12 for the control of quality-related activities. Specific
13 implementing procedures are established to control
14 activities in compliance with the requirements of the
15 program.

16 S&L policy, as established by the Chief Executive Officer,
17 makes compliance with this Nuclear Quality Assurance Manual
18 mandatory for all personnel performing quality-related
19 activities.

20 02.02 Safety-related structures, systems and components for a
21 project are identified, and design and procurement
22 activities are controlled by the Nuclear Quality Assurance
23 Program and the implementing procedures.

24 The Nuclear Quality Assurance Program and procedures are in
25 effect prior to initiation of activities affected thereby.

1 02.03 S&L standards and procedures provide for the documentation
2 and dissemination of management policies and practices for
3 the control of activities affecting the quality of nuclear
4 safety-related structures, systems and components. Each
5 level of management generates standards and/or procedures
6 covering its areas of responsibility unless standards and/or
7 procedures issued by another level of management adequately
8 specify requirements. These standards/procedures establish
9 design, performance, fabrication, installation or operation
10 requirements for a system, structure or component; or
11 establish methods for controlling activities within a
12 department or division. Such standards/procedures are
13 applied to the work performed by the personnel within the
14 related department or division.

15 The mandatory requirements for nuclear quality-related
16 activities are delineated in the standards/procedures. When
17 a deviation from such requirements is necessary, appropriate
18 review and approval of the proposed deviation is required
19 and is documented.

20 02.04 S&L quality-related activities meet the requirements of the
21 client, S&L, applicable codes, standards, and regulatory
22 agencies.

23 02.05 The development and use of computer programs for quality-
24 related activities are controlled by the Nuclear Quality
25 Assurance Program. Computer programs and other software are
26 developed in defined sequential phases as part of a software
27 life cycle. Engineering application programs

1 are verified for correctness and feasibility of program
2 functions and for achievement of requirements for each phase
3 within the assumptions and limitations stated in the program
4 documentation. Prior to use, programs are validated by
5 documented testing to demonstrate proper performance. Test
6 requirements and acceptance criteria are provided or
7 approved by the responsible design organization. A variety
8 of typical problems is used in the validation process.
9 Results are checked against known solutions, solutions
10 obtained from other verified and validated computer
11 programs, and/or hand calculations.

12 Procedures require computer programs used for engineering
13 design or analysis applications to be uniquely identified.
14 These programs, which will not be individually verified and
15 validated for each application, are listed in the S&L online
16 configuration management database. To the extent
17 appropriate, controls are established to prevent
18 unauthorized changes to verified and validated program
19 files. Temporary changes to listed programs may be
20 authorized in special circumstances. However, all such
21 changes are required to be validated and documented.

22 02.06 To assure that appropriate skills are utilized in the
23 performance of quality-related activities, position
24 descriptions and experience records have been prepared. The
25 position descriptions include minimum educational and
26 experience requirements for each position. Experience
27 records are used to verify qualification of persons in
28 quality-related positions.

29 The Nuclear Quality Assurance Program provides for
30 indoctrination and training of personnel performing

1 activities affecting quality. Training ensures that
2 personnel will achieve proficiency in those parts of the
3 quality assurance program and procedures pertinent to their
4 activities before assuming responsibility for those
5 activities. This training is accomplished in accordance with
6 a standard operating procedure.

7 Training in appropriate S&L administrative and technical
8 standards and procedures is provided, as applicable, for
9 personnel performing quality-related tasks. The responsible
10 managers establish the training scope and designate who is
11 to be trained.

12 A *standard operating* procedure provides for training of
13 project personnel in project instructions controlling
14 quality-related activities.

15 Training activities are documented. Identification of
16 personnel receiving training and of the standards,
17 procedures, and project instructions in which they were
18 trained is documented.

19 02.07 Differences of opinion between Quality Assurance and other
20 S&L organizations are resolved by the Chief Executive
21 Officer. Resolution is documented.

1 02.08 Management annually assesses the adequacy of this QA
2 Program's overall implementation. This assessment is
3 initiated by the Chief Executive Officer. The management
4 team is led by an S&L owner and consists of senior level
5 personnel, such as Project Managers and Senior Project
6 Engineers, with expertise in the engineering disciplines.
7 The report of the assessment is approved by the Chief
8 Executive Officer and is distributed to the responsible
9 management for action.

1 06.00 DOCUMENT CONTROL

2 06.01 Procedures and practices are established to control the
3 issuance of design documents, instructions, and procedures,
4 including changes thereto, which prescribe activities
5 affecting quality.

6 The Nuclear Quality Assurance Program and implementing
7 procedures include measures which provide assurance that
8 documents, including changes, are reviewed for adequacy and
9 inclusion of quality requirements, approved for release by
10 authorized personnel, and distributed for use at the
11 location where the prescribed activity is performed. The
12 groups and/or individuals responsible for these activities
13 are identified.

14 Those participating in an activity are made aware of and use
15 proper and current instructions, procedures, drawings,
16 specifications, codes and standards for performing the
17 activity. Participating organizations have procedures for
18 control of these documents and changes thereto, to preclude
19 the possibility of use of outdated or inappropriate
20 documents. Master lists are distributed on a regular basis
21 or made available electronically so that recipients can
22 verify that they are working with current issue of this
23 program, procedures and drawings. Master lists of other
24 activities are provided on a timely basis.

25 06.02 Document control measures provide for:

26 a. reviewing documents and their revisions for adequacy and
27 inclusion of quality requirements prior to release for
28 use;

- 1 b. identifying individuals or organizations responsible for
2 preparing, reviewing, approving, and issuing documents
3 and revisions thereto;
- 4 c. identifying and maintaining current the proper documents
5 and their status, e.g., "preliminary," "approved for
6 construction," "approved for bids," etc., as
7 appropriate;
- 8 d. coordinating and controlling interface documents;
- 9 e. assuring availability of documents at the onset of work
10 for which they are needed;
- 11 f. establishing current and updated document distribution
12 lists *for hardcopy distributions*;
- 13 g. obsoleting, recalling, or in some manner identifying
14 documents not intended for current use.

15 Changes to documents are reviewed and approved with a degree
16 of control commensurate with the original document, by the
17 same organizations that performed the original review and
18 approval unless other qualified organizations are
19 specifically designated by S&L management. However,
20 nontechnical editorial changes to design documents may not
21 require that the revised document receive the same review
22 and approval as the original document. In such cases, these
23 types of changes and the person who can authorize such a
24 decision are delineated in the procedure controlling
25 issuance of the document. Reviewers have access to
26 pertinent background information upon which to base the

1 review, and have an adequate understanding of the
2 requirements and intent of the original document.

3 The Nuclear Quality Assurance Program and implementing
4 procedures require that approved changes be reviewed for
5 applicability to related instructions, procedures, drawings,
6 and other appropriate documents, and that those affected
7 documents be changed through controls consistent with the
8 original issue. Approved changes are required to be
9 traceable as well as implemented by all organizations
10 involved.

11 06.03 The scope of the S&L document control system includes
12 procedures and instructions for such activities as
13 construction, modification, installation, test and
14 inspection, procurement documents, nonconformance reports,
15 manuals, design documents (e.g., calculations, drawings,
16 specifications and analyses), and documents related to
17 computer codes and as-built information.

1 07.00 CONTROL OF PURCHASED MATERIAL, EQUIPMENT AND SERVICES

2 07.01 Implementing procedures to the Nuclear Quality Assurance
3 Program establish measures to assure that purchased items
4 and services are clearly and adequately specified in
5 procurement documents and that suppliers are capable of
6 producing items and furnishing services, whether purchased
7 directly or through subsuppliers, which conform to
8 procurement document requirements. These procedures include
9 provisions for supplier evaluation, review of procurement
10 requirements, and surveillance of the supplier, when S&L is
11 responsible for the procurement or requested by the client.

12 Results of evaluations performed on suppliers prior to
13 contract award are documented, and available for audit.

14 Evaluation of procurement sources is performed by S&L
15 engineering and quality assurance personnel, as appropriate.

16 Recommendation of procurement sources is based on these
17 evaluations. The evaluations cover review of capabilities
18 and facilities for technical, manufacturing, erecting,
19 installing, and quality performance, and include any or all
20 of the following as appropriate:

21 a. historical performance data, particularly in product
22 quality and on-time performance;

23 b. review and comment on supplier quality assurance program
24 and procedures;

25 c. source audits to verify supplier implementation of his
26 quality assurance program, as required;

1 d. source qualification programs.

2 The quality assurance programs of potential suppliers are
3 evaluated to determine compliance with the applicable
4 criteria of 10 CFR Part 50, Appendix B, with ANSI/ASME N45.2
5 or NQA-1 and applicable Regulatory Guides, with ASME Section
6 III, Divisions 1 and 2, and with other ANSI Standards. The
7 evaluation is accomplished prior to an award by S&L or
8 submittal of the recommendation letter to the client, as
9 applicable, and thereby precedes initiation of quality-
10 related activities. Proposals from bidders are reviewed by
11 S&L in accordance with approved quality assurance procedures
12 by the appropriate divisions, and Quality Assurance. The
13 evaluation of proposals includes review for bidder
14 capability to meet Nuclear Quality Assurance Program
15 requirements in procurement documents.

16 S&L may recommend to the client that an audit be performed,
17 prior to award of purchase order or contract, to evaluate
18 current implementation of the supplier quality assurance
19 program. Preaward meetings with suppliers to resolve any
20 questions are held prior to any recommendation for purchase,
21 when required.

22 When S&L is responsible for procurement or when S&L is
23 requested by the client, S&L assures that procurement
24 documents require the successful bidder to submit the
25 following, as applicable, to S&L for review by cognizant
26 divisions in accordance with procedures:

27 a. special process procedures such as, but not limited to,
28 welding, heat treating, nondestructive examination;

- 1 b. recommended supplier inspection point program;
- 2 c. appropriate documentation as established by applicable
3 codes, standards, regulations, and procurement
4 documents;
- 5 d. notices of nonconformances and deviations;
- 6 e. test procedures in accordance with applicable codes and
7 standards;
- 8 f. documentation of quality of any commercial, "off-the-
9 shelf" items.
- 10 07.02 On client request or per procurement requirements,
11 surveillances are performed in facilities of suppliers
12 furnishing materials, parts, components, or services to
13 assure compliance with quality requirements. Surveillances
14 are conducted by qualified personnel in accordance with
15 documented procedures that specify the characteristics or
16 processes to be witnessed or verified and accepted, the
17 method of surveillance and documentation required, and those
18 responsible for implementation of the procedure.
- 19 When appropriate, provisions are established by procedures
20 for the identification of mandatory inspection hold points.
- 21 S&L supplier surveillances may include but are not limited
22 to monitoring of in-process manufacturing, witnessing of
23 tests, inspections and nondestructive examinations (per
24 inspection point programs), monitoring of conformance to
25 accepted welding procedures and a review of supporting
26 documentation thereof, monitoring of control and calibration

1 of measuring equipment, surveillance of heat treating
2 processes, and observation of packing and shipping
3 activities. As requested by the client, or as determined by
4 S&L, supplier surveillances may include review of pertinent
5 supplier documentation during fabrication, shipping and
6 final inspection, review of documentation to be shipped to a
7 plant or construction site, and review of completed project
8 checklists and release tags prior to release of equipment
9 for shipping.

10 The intervals and depth of the surveillances are determined
11 by client or S&L requirements, but are consistent with the
12 relative importance, complexity, and quantity, and the
13 frequency of procurement of the item or service being
14 furnished.

15 07.03 Audits of suppliers are conducted, per Section 18.00 and
16 implementing procedures at maximum three-year intervals,
17 except as stipulated below, to assure compliance with
18 quality requirements. Supplier audits include auditing of
19 suppliers' certificates of conformance when these
20 certificates are used as a basis for accepting the item or
21 service.

22 Audits of suppliers, after award of a contract, and annual
23 evaluations of suppliers are not necessary for procurement
24 actions when the items or related services are all of the
25 following:

- 26 a. relatively simple and standard in design, manufacture
27 and test, and

1 b. adaptable to standard or automated inspections or tests
2 of the end product to verify quality characteristics
3 after delivery, and

4 c. such that receiving inspection does not require
5 operations that could adversely affect the integrity,
6 function or cleanliness of the item.

7 For the following cases, audits and annual evaluations of
8 suppliers are also not necessary. S&L may accept these
9 procurements by the following methods in lieu of those given
10 in the NRC Regulatory Guide 1.144:

11 a. For short-term engineering and consulting services, such
12 as qualification testing or a design performed by a
13 consultant which will be independently verified by S&L,
14 acceptance may be by technical verification of data
15 produced as discussed in Section 03.04, by surveillance
16 of the activity by a design engineer or a QA engineer,
17 and/or by review of objective evidence for conformance
18 to the procurement document requirements, such as by
19 review of a stress report, as discussed in Section
20 03.04.

21 b. For procurement of computer programs, including
22 maintenance contracts which provide updates to the
23 programs and which provide for error reports, acceptance
24 may be verification and validation of the portion of the
25 program and updates to be utilized in accordance with
26 Section 3.04.

1 07.04 S&L suppliers may install safety-related items in nuclear
2 plant or, for financial reasons, S&L may elect to purchase a
3 safety-related item and transfer ownership to a client at
4 the point of receipt at the site, in a client's warehouse,
5 or at some other time prior to installation.

6 In this case of ownership transfer, there shall be a written
7 agreement with the client delineating the division of
8 responsibility for quality assurance. In the case where S&L
9 or its suppliers conduct receiving inspection of items, the
10 inspection is performed in accordance with the client's QA
11 program and implementing procedures, or Chapter 10.00 of
12 this program and implementing procedures.

13 Receiving inspections ensure that:

- 14 a. materials, components, or equipment are properly
15 identified and correspond to the identification of the
16 purchase document and the receiving documentation;
- 17 b. materials, components, equipment and acceptance records
18 satisfy the inspection instructions prior to
19 installation or use;
- 20 c. damaged items are reported.

21 If a S&L supplier will be installing safety-related items in
22 a nuclear plant or if ownership is to be transferred,
23 receipt inspection also ensures that specified inspection,
24 test and other records (such as certificates of conformance
25 attesting that the material, components, and equipment
26 conform to specified requirements), are available at the

1 nuclear plant prior to installation, use or ownership
2 transfer.

3 S&L receiving inspections for other items do not include
4 responsibility for availability of inspection, test and
5 other records at plant sites prior to installation or use of
6 the corresponding equipment. This function is assumed by
7 the client.

8 07.05 When S&L will be supplying records for purchased items to a
9 client, the following records shall be furnished:

10 a. Documentation that identifies the purchased items and
11 the specific procurement requirements (e.g., codes,
12 standards, and specifications) met by the item.

13 b. Documentation identifying any procurement requirements
14 that have not been met.

15 c. A description of those nonconformances from the
16 procurement requirements dispositioned "use-as-is" or
17 "repair."

18 07.06 Where the design utilizes commercial grade items, the
19 following requirements are a permissible alternative for
20 acceptance, to other requirements of this chapter:

21 a. An approved design document identifies the commercial
22 grade item. (An alternate commercial grade item may be
23 applied, provided S&L provides verification that the
24 alternate commercial grade item will perform the
25 intended function and will meet design requirements

- 1 applicable to both the replaced item and its
2 application.)
- 3 b. S&L performs source evaluation and selection, where
4 determined necessary, based on complexity and importance
5 to safety.
- 6 c. S&L identifies commercial grade items in the purchase
7 order by the vendor's published product description.
- 8 d. After receipt of a commercial grade item, S&L determines
9 the following:
- 10 (1) Damage was not sustained during shipment;
- 11 (2) The item received was the item ordered;
- 12 (3) Inspection and/or testing is accomplished, as
13 required by the purchaser, to assure conformance
14 with the manufacturer's published requirements;
- 15 (4) Documentation, as applicable to the item, was
16 received and is acceptable.

1 17.00 QUALITY ASSURANCE RECORDS

2 17.01 Requirements are established in this program and
3 implementing procedures for generation, collection,
4 compilation, storage, and retrieval of documentation
5 necessary to provide records of quality for S&L quality-
6 related activities.

7 Unless S&L is directed to forward all project-related
8 quality assurance records to the client, procedures require
9 retention of quality assurance records such as, but not
10 limited to design input documents, project design documents
11 (design criteria, drawings, calculations, specifications,
12 and standards), personnel qualification statements and
13 certifications, personnel training records, audit and
14 surveillance reports and replies thereto, inspection
15 reports, calibration procedures/reports, nonconformances and
16 corrective action reports, change control documents,
17 deviations, design review reports, applicable correspondence
18 and meeting notes.

19 17.02 Procedures require that sufficient records be prepared as
20 work is performed to provide assurance of the quality of the
21 activities performed, and that such records be consistent
22 with applicable codes, standards, and specifications. The
23 quality assurance records are identified and filed in a
24 timely and orderly manner to allow for access and
25 retrievability. They are carefully handled to maintain
26 legibility and preserve the original quality of the records
27 to the maximum extent.

- 1 17.03 Inspection and test records, other than for computer
2 software, contain the following where applicable:
- 3 a. A description of the type of observation;
 - 4 b. The date and results of the inspection and test;
 - 5 c. Information related to conditions adverse to quality;
 - 6 d. Inspector or data recorder identification;
 - 7 e. Evidence as to the acceptability of the results;
 - 8 f. Action taken to resolve any discrepancies noted.
- 9 17.04 Procedures, consistent with regulatory requirements, have
10 been prepared and include the requisites for transmittal,
11 retention, maintenance and retrieval of records. Records
12 are stored in a facility or in separate remote locations
13 that provide controlled access, minimize the risk of damage
14 or destruction from fire, flood, tornadoes, condensation,
15 vermin and decay and satisfy the requirements described in
16 Regulatory Guide 1.88, except for the minimum fire rating
17 requirement for a single record facility. Instead, S&L
18 provides for a:
- 19 a. 2 hour fire rated vault meeting NFPA 232-1975, or
 - 20 b. 2 hour fire rated class B file containers meeting the
21 requirements of NFPA 232-1975, or

- 1 c. 2-hour fire rated file room meeting the requirements of
2 NFPA 232-1975 with the following additional provisions:
- 3 (1) early warning fire detection and automatic fire
4 suppression capability with electronic supervision
5 at a constantly attended central station;
 - 6 (2) records storage in fully enclosed metal cabinets;
 - 7 (3) adequate access and aisle ways;
 - 8 (4) prohibition in the room of work not directly
9 associated with record storage or retrieval;
 - 10 (5) prohibition in the room of smoking, eating, or
11 drinking;
 - 12 (6) 2-hour fire rated dampers or doors in all boundary
13 penetrations.

14 17.05 Quality assurance records are maintained by S&L until a
15 project is complete unless otherwise directed by the client.
16 At completion of the project, the quality assurance records
17 are delivered to the client in accordance with procedures.

18 17.06 Records associated with radwaste packaging shall include the
19 instructions, procedures, and drawings required by 10 CFR
20 71.111 to prescribe quality assurance activities and

21 shall include closely related specifications such as
22 required qualifications of personnel, procedures, and
23 equipment. Records shall be retained for 3 years beyond the
24 date when S&L or its suppliers last engages in the related

1 activity. If any portion of the written procedures or
2 instructions is superceded, S&L or its suppliers shall
3 retain the superceded material for 3 years after it is
4 superceded.

5 17.07 Records associated with ISFSIs must include the following:
6 design records, records of use and the results of reviews,
7 inspections, tests, audits, monitoring of work performance,
8 and material analysis.

9 Records pertaining to the design fabrication, erection,
10 testing, maintenance, and use of ISFSI structures, systems,
11 and components important to safety shall be maintained under
12 the control of, and as directed by, the licensee until the
13 NRC terminates the ISFSI license.

14 17.08 *Electronic records may be authenticated in accordance with*
15 *the guidance given in NIRMA Technical Guide 11. This*
16 *authentication shall be made in one of three ways: a*
17 *hardcopy authorization from the authentication authority to*
18 *add the authority's electronic signature to the document; an*
19 *electronic signature controlled by a user ID/password*
20 *combination; or a digital signature.*

21 *When authentication authority is transferred to a designee,*
22 *measures are identified and documented to ensure that only*
23 *those designees properly authorized do authenticate*
24 *records/media. These measures include a counter (secondary)*
25 *signature.*

26 *System administrator(s) assign passwords to be used for*
27 *electronic signatures.*

1 18.00 AUDITS

2 18.01 S&L utilizes a system of planned and periodic audits and
3 surveillances to verify compliance with and to assess the
4 effectiveness of all aspects of the S&L Nuclear Quality
5 Assurance Program and the implementing procedures.
6 Organizations subject to audit and surveillance by S&L
7 include:

8 a. S&L business and functional support groups, departments,
9 divisions and project groups;

10 b. S&L suppliers, or other suppliers as requested by a
11 client.

12 Audits and surveillances include evaluation of quality system
13 practices and/or procedures and the effectiveness of their
14 implementation, monitoring of work areas and activities, and
15 review of pertinent documents and their control and
16 maintenance.

17 18.02 Audits and surveillances within S&L are carried out by
18 Quality Assurance in accordance with the requirements of
19 standard operating procedures. The objectives of these
20 audits and surveillances are:

21 a. to verify that the policies, procedures, and instructions
22 necessary for implementation of *this* program are
23 established in a timely manner;

24 b. to determine the degree of compliance with this program
25 and its implementing procedures by personnel performing
26 quality-related functions;

- 1 c. to determine the degree of compliance on each project
2 with project instructions, standards, procedures and
3 other applicable documents, such as codes and national
4 standards which provide guidance for the project;
- 5 d. to assess the effectiveness of this program and its
6 implementing procedures.

7 Audits and surveillances are conducted by S&L personnel who
8 have no direct responsibility in the areas they audit and
9 review. Auditors are required to possess the educational,
10 training, and experience qualifications for auditing and
11 surveillance as specified in implementing procedures.

12 The Nuclear Quality Assurance Program requires that the work
13 of support divisions and nuclear project teams be audited on
14 applicable elements of this program, implementing quality
15 assurance procedures, project instructions, standards and
16 procedures on the basis of the safety importance of the
17 activity being performed, but at least biennially for nuclear
18 projects *or projects supporting gaseous diffusion plants*
19 *which are in the operating or decommissioning phase, and*
20 *annually or once during the life of the activity, whichever*
21 *is shorter, for projects in the construction phase. Projects*
22 *supporting radioactive material packaging or ISFSIs are*
23 *audited at least annually. An audit schedule is prepared*
24 *each year identifying the audits to be performed and their*
25 *scheduled dates. Scheduling is dynamic and resources are*
26 *supplemented when QA program effectiveness is in doubt.*
27 *Surveillances led by qualified lead auditors may be*
28 *substituted for portions or all of an audit, if a lead*
29 *auditor evaluates the surveillance(s) as examining the same*

1 activity to be audited and the surveillance(s) is performed
2 within the same biennial or annual audit period.

3 Under special circumstances, the Quality Assurance Manager
4 may grant postponements of audits as specified in standard
5 operating procedures.

6 Audits and surveillances are initiated early in the design
7 and procurement phase. The following areas fall within the
8 scope of the S&L audit program:

- 9 a. preparation, review, approval, and control of early
10 procurements;
- 11 b. indoctrination and training programs;
- 12 c. interface control among the client, S&L, and other
13 organizations.

14 Audit and surveillance reports are approved by the Quality
15 Assurance Manager or Chief Executive Officer, or their
16 designees, and distributed to the persons directly
17 responsible for the areas or functions audited: Chief
18 Executive Officer, the appropriate Business Group Director,
19 the Project Director and Project Manager, the Director of
20 Engineering, the appropriate Engineering Department and
21 Division Managers, and to others designated by the Quality
22 Assurance Manager.

23 18.03 External audits and surveillances, as required, of suppliers
24 are performed by Quality Assurance with assistance, as
25 required, of personnel from appropriate projects or divisions
26 acting as technical specialists.

1 18.04 Procedures for both internal and external audits provide for
2 audit planning, execution, evaluation of results, postaudit
3 conference with management in the audited area, and
4 reporting. An audit plan is developed for each audit,
5 indicating the audit scope, the activities to be audited, the
6 applicable documents and requirements, the schedule, and the
7 audit team. Audits are performed in accordance with written
8 procedures or checklists. The audit checklist, when
9 required, is intended for use as a guide and may be altered
10 or departed from during an audit in order to achieve the
11 audit's objectives. Such changes must be documented and
12 become part of the audit record.

13 A written report is required for each audit and surveillance.
14 The report includes:

- 15 a. a statement of the audit scope;
- 16 b. identification of the auditors and lead auditor;
- 17 c. identification of persons and/or areas audited;
- 18 d. description of each nonconformance identified;
- 19 e. request to responsible personnel for reply on corrective
20 action within a stated period;
- 21 f. an evaluation statement regarding the effectiveness of
22 the program elements that were audited, if appropriate;
- 23 g. recommendations for improvement of the Program, as
24 appropriate.

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Follow-up of deficient areas as described in nonconformances is required in accordance with procedures. Nonconforming areas are reaudited and/or appropriate corrective action documentation is examined as necessary to assure that effective corrective action has been taken by the responsible management.

The management of the area audited responds within 30 days of receipt of the nonconformance report, indicating corrective action to be taken and the schedule for completion. Extension of the 30-day requirement for responding to nonconformances may be granted by the Quality Assurance Manager when justifiable. Reaudits, when necessary, are conducted on a timely basis, commensurate with the scheduled completion of corrective action in accordance with quality assurance procedures. These reaudits may either be limited to verification of implementation of required corrective actions or, when corrective action results in significant reorganization or procedure revisions, when the quality of an item is suspected to be in jeopardy due to deficiencies in this quality assurance program identified during the nonconformance evaluation, or when a systematic, independent assessment of program effectiveness is considered necessary, they shall be more general. Audit and surveillance reports are filed and available for audit.