National Institute of Standards and Technology

NVLAP

National Voluntary Laboratory Accreditation Program

PROGRAM HANDBOOK

COMPUTER NETWORK INTERFACE PROTOCOL X.25

NISTIR 89-4036

MARCH 1989

U.S. Department of Commerce
National Institute of Standards and Technology
Gaithersburg, Maryland 20899

NVLAP PROGRAM HANDBOOK COMPUTER NETWORK INTERFACE PROTOCOL X.25

REQUIREMENTS FOR ACCREDITATION

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National Voluntary Laboratory
Accreditation Program

NISTIR 89-4036 MARCH 1989

U.S. DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899

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APPENDICES

I. PROGRAM SUMMARY

This document presents the operational and technical requirements of the National Voluntary Laboratory Accreditation Program (NVLAP) related to Department of Defense specifications for communications network interfacing. Explanations of NVLAP's technical requirements indicate how criteria apply to the laboratory accreditation process.

The Defense Communications Agency (DCA) is the provider of the common-user packet-switched communications network, the Defense Data Network (DDN), for the Department of Defense. In December 1983, DCA issued DDN X.25 Host Interface Specifications, which communications processors (computer hosts) must meet in order to interface with the DDN. DDN X.25 describes specific options and features of CCITT Recommendation X.25 and Federal Information Processing Standard (FIPS) 100, dated July 1983, that are required for the DDN.

In July 1988, DCA requested that the National Bureau of Standards, now the National Institute of Standards and Technology (NIST), establish a NVLAP program to recognize and accredit laboratories that produce reliable test data on conformance testing of vendor products to assure that they meet the DDN X.25 Specification.

Any laboratory (including commercial, manufacturers', university, Federal, State, or local government) that uses test methods listed in this document may apply for NVLAP accreditation. Accreditation will be granted to a laboratory that complies with conditions for accreditation defined in the NVLAP Procedures: Title 15, Part 7 of the Code of Federal Regulations. The names of NVLAP-accredited laboratories are published in the Federal Register, NVLAP Annual Directories, and other media to which information is regularly provided.

Testing services covered: DDN X.25 Host Interface Qualification Tests

Period of accreditation: One year, renewable annually

On-site assessment: Visit by a technical expert to determine compliance with the NVLAP criteria before initial accreditation and every two years thereafter. Monitoring visits as required.

Assessors: Selected from technical experts with experience in the appropriate field(s) of testing.

Proficiency testing: Each laboratory is required to test and analyze a known reference protocol implementation. The completed test report is sent to NVLAP for analysis. Proficiency testing is required for initial accreditation and is conducted annually. Advance notice and instructions are given before testing is scheduled.

II. INTRODUCTION

Background

The U.S. Department of Commerce, National Institute of Standards and Technology (NIST), formerly the National Bureau of Standards (NBS), administers the National Voluntary Laboratory Accreditation Program (NVLAP). NVLAP's function is to accredit public and private testing laboratories based on evaluation of their technical qualifications and competence for conducting specific test methods in specified fields of testing. Accreditation is granted on the basis of conformance with criteria published in the Code of Federal Regulations as part of the NVLAP procedures (15 CFR Part 7) (see Appendix A).

This document is intended for information and use by staff of accredited laboratories, those seeking accreditation, other laboratory accreditation systems, and others needing information on the requirements for accreditation under this NVLAP program. This document is generally included in the NVLAP Application Package along with General Application Forms, Test Method Selection Lists, and other materials needed to apply for or renew accreditation. It presents the administrative and operational procedures and technical requirements of the accreditation program and should be retained and be readily accessible to laboratory personnel.

NVLAP Accreditation

NVLAP accreditation is available to commercial laboratories, manufacturers' in-house laboratories, university laboratories, Federal, State, and local government laboratories. Foreign-based laboratories may be accredited by NIST if they meet the same requirements as domestic laboratories and pay any additional fees required (see Appendix D).

NVLAP is self-supporting and operates on a cost reimbursable basis by charging fees to those who pursue accreditation. The program receives no appropriated public funds.

Accreditation is granted only after thorough evaluation of the applicant has demonstrated that all NVLAP criteria have been met. Laboratories which successfully demonstrate compliance with the criteria are issued two documents to attest to that compliance: (1) a Certificate of Accreditation, and (2) a Scope of Accreditation which states the specific test methods and services for which the laboratories has been accredited (see Appendix I).

Why NVLAP Accreditation?

A laboratory may wish to be accredited for many reasons such as; legal requirements, regulations or codes, contract specifications, or the desire to be recognized as demonstrably competent to meet the needs of its clients.

NVLAP provides formal recognition of the competence of accredited laboratories to the user community. Information about accredited laboratories, including the name and scope of accreditation, is disseminated in various media.

For accreditation to be meaningful, it must be granted by a clearly credible organization. NVLAP provides an unbiased third party evaluation and recognition of performance as well as expert technical assistance to upgrade laboratory performance.

Testing Laboratory Defined

NVLAP defines "testing laboratory" as an organization that provides services to measure, examine, test, calibrate, or otherwise determine the characteristics or performance of materials, products or systems. See Appendix E for information about laboratory main and sub facilities.

Accreditation Defined

NVLAP accreditation signifies recognition of a testing laboratory's competence to perform specific test methods in specified fields of testing. It means that the laboratory's quality system, staff, facilities and equipment, calibration procedures, test methods and procedures, records, and test reports have all been evaluated and found to meet NVLAP criteria. NVLAP accreditation does not mean a guarantee (certification) of laboratory performance or of product test data; it is solely a finding of laboratory competence.

NVLAP Programs

Laboratories may participate in as many NVLAP programs as they wish, provided that they meet all NVLAP criteria for each program. Programs currently available are:

- Acoustical Testing Services
- Asbestos in Bulk Insulation and Air
- Carpet
- Commercial Products Testing
  - Paints and Coatings
  - Paper and Related Products
  - Plastics
  - Seals and Sealants
- Computer Network Interface Protocols
- Construction Testing Services
- Electromagnetics Compatibility and Telecommunications
- Personnel Radiation Dosimetry
- Thermal Insulation Materials
- Wood Stoves

For further information about NVLAP, or for assistance in understanding and meeting the NVLAP requirements and criteria, please write or call:

NVLAP
National Institute of Standards and Technology*
ADMIN A527
Gaithersburg, MD 20899
Phone: (301) 975-4016

* formerly the National Bureau of Standards (NBS)

III. OPERATIONAL INFORMATION AND REQUIREMENTS

The information and requirements presented in this section are generally applicable to all NVLAP programs. The requirements specified in Sections 7.31 and 7.32 of the NVLAP Procedures (Appendix A) and those specified in this section must be met in order to gain accreditation.

Laboratory Code Number (LAB CODE)

Each participating laboratory is assigned a four-digit laboratory code number. The code number is used by the NVLAP staff for identification, filing, recordkeeping, and database management. Participants are requested to put their Lab Code number on all correspondence with NVLAP. The Lab Code number is cross-referenced with the laboratory name and location in the NVLAP Directory of Accredited Laboratories.

Accreditation Period

Accreditation is granted for a period specified in the Accreditation Application Package (usually one year). The accreditation period begins on one of four dates: January 1, April 1, July 1, or October 1. Once a laboratory has been assigned an accreditation date, it retains that date as long as it remains in the program. Accreditation both expires and is renewed on that date.

Approved Signatory

The laboratory must designate one or more staff members as Approved Signatories. The name of at least one Approved Signatory must appear on all test reports endorsed with the NVLAP logo (see section Use of the NVLAP Logo elsewhere in this Handbook). This person is responsible for the technical contents of the report and is the one to be contacted by NVLAP, laboratory clients, or others in case of questions or problems with the report.

There is no formal requirement for nomination or approval of persons designated as Approved Signatories. The laboratory must inform NVLAP of its appointments by completing the appropriate sections in the General Application for accreditation. Approved Signatories should be persons with adequate responsibility or authority within the organization, with adequate and appropriate technical capabilities, and without conflict of interest.

Laboratory test reports carrying the NVLAP logo need not be signed individually by the Approved Signatory. Test report forms may be preprinted with the required information. Forms that are electronically or computer generated may have the information printed along with the test results.

Authorized Representative

The laboratory must designate an Authorized Representative to sign the application form and commit the laboratory to fulfill the NVLAP requirements. The Authorized Representative is the only one who can authorize a change in the scope or nature of the laboratory's application. The Authorized Representative may also be an Approved Signatory.

Renewal

Each participating laboratory will be sent a renewal Application Package, well in advance of the expiration date of its accreditation, to allow sufficient time to complete the renewal process. The technical requirements and fees for renewal are generally the same as for initial accreditation.

The application and fees must be received by NIST prior to expiration of the laboratory's current accreditation to avoid a lapse in accreditation. If an on-site assessment is required, the application and fees must be received to allow sufficient time for the visit to be completed and deficiencies corrected prior to expiration of accreditation. In addition, any current proficiency testing requirements must be met.

Keeping NVLAP Informed

During the accreditation period, a laboratory must inform NVLAP:

of any major changes involving the location, ownership, management structure, authorized representative, technical director, approved signatories, or facilities;

if it wishes to delete a test method; or

if it is no longer capable of performing test methods or services for which it is accredited.

If a laboratory elects not to renew or wishes to voluntarily terminate its accreditation at any time, the notification of such intention should be forwarded to NVLAP in writing.

Additions to Scope of Accreditation

During the accreditation period, a laboratory may request the addition of test methods or services to its Scope of Accreditation. The laboratory must meet all NVLAP criteria for the additional test methods or services such as fees, proficiency testing, technical requirements, etc. The need for an additional on-site assessment will be determined on a case-by-case basis.

NVLAP Directory

NVLAP publishes an annual Directory of Accredited Laboratories. The Directory contains the name and address, scope of accreditation, contact person, and the accreditation renewal date for each accredited laboratory. Supplements to the Directory are published quarterly to cover interim accreditation actions including initial accreditations, renewals, suspensions, terminations, and revocations. The Directory is distributed nationally and internationally to manufacturers, suppliers, retailers, professional and trade associations, code groups, and government agencies.

Referencing Your Accredited Status and Use of the NVLAP Logo

Accredited laboratories are encouraged, within specified limits, to announce their accredited status. The NVLAP logo may be used in such announcements. Photographic copies of the logo are available from the NVLAP office.

A laboratory must limit the representation of the scope of its accreditation to only those tests or services for which accreditation has been granted. The following statement is recommended: "Accredited by the National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program for selected test methods or service."

In Advertising

Laboratory advertising of accredited status must be limited to professional, technical, trade, or other laboratory services publications. Letterhead referencing NVLAP accreditation may be used in direct solicitation for business from potential customers. It is recommended that a copy of the NVLAP Certificate and Scope of Accreditation be appended to such a solicitation.

News stories and advertising by laboratories of their accredited status in the trade press is permissible and encouraged. The use of advertisements in the trade press is consistent with NVLAP procedures.

Laboratories may not reference their accredited status in consumer media, in product advertising, or on product labels, containers and packaging. The nature or type of product advertising prohibited by NVLAP procedures includes any advertising that is intended to encourage a consumer to purchase a product because it was tested by an accredited laboratory, whether that advertising appears in consumer media, the business media, or at a point of sale to consumers. Advertising must not imply product certification by NVLAP, NIST, or the U.S. Government.

On Laboratory Documents

As long as a laboratory is NVLAP accredited, it may use the NVLAP logo on letterhead and brochures, preferably with the qualifying quote given above. The logo may be used on test reports that are within the scope of accreditation. These reports must bear the name of an Approved Signatory in accordance with the guidelines given in the Approved Signatory section of this Handbook.

Compliance With Existing Laws

Accreditation does not relieve the laboratory of the need to observe and comply with existing Federal, State, and local statutes, ordinances, or regulations that may be applicable to its operations, including consumer protection and antitrust laws.

IV. TECHNICAL EXPERTS

NVLAP uses Technical Experts (TEs) as assessors and evaluators. They may be engineers or scientists currently active in the field, consultants, college professors or retired persons. They are selected on the basis of their professional and academic achievements, experience in the field of testing, management experience, and tact in dealing with people. Their services are generally contracted as required; they are not NVLAP staff members.

Assessors are TEs selected to conduct an on-site assessment of a particular laboratory on the basis of how well their individual experience matches the type of testing to be assessed, as well as absence of conflicts of interest. The laboratory has the right to appeal the assignment of an assessor and may request an alternate.

Evaluators are TEs selected to review the record of the laboratory as a whole, including the application, assessment report, deficiencies, corrections to deficiencies, and proficiency test results and, based on this record, to recommend whether or not a laboratory should be accredited. The evaluators are matched to the type of testing being evaluated and are selected to avoid conflicts of interest.

V. ACCREDITATION PROCESS

Accreditation is granted following successful completion of a process which includes submission of an application and payment of fees by the laboratory, an on-site assessment, resolution of deficiencies identified during the on-site assessment, participation in proficiency testing, technical evaluation, and administrative review. The process is described in the following sections.

Application and Fees

An **Application Package** is sent to a laboratory on request. It includes: **General Application Forms**, **Fee Calculation** forms, and the program Handbook. The **General Application Form** must be completed and signed by the authorized representative of the laboratory. Before completing and signing the application, the authorized representative should review all documents and become familiar with NVLAP requirements.

In general, the accreditation fee is composed of several parts, some of which are fixed while others depend on the scope of accreditation desired and the specifics of the program. The total accreditation fee must be paid before accreditation can be granted. The individual parts of the accreditation fee include, as appropriate: an Administrative and Technical Support fee, a Test Method fee, a Proficiency Testing fee, the cost of reference materials and quality assurance samples, and an On-Site Assessment fee. The fees for this accreditation program are shown in the **Fee Calculation Sheet** included in the **Application Package.**

The laboratory will be contacted to schedule a mutually acceptable date for the on-site assessment after payment of all required fees and will be notified of any additional information which must be supplied, and of any applicable proficiency testing requirements which must be completed, for the technical evaluation.

On-site Assessment

Before initial accreditation and periodically thereafter, an on-site assessment of each laboratory is conducted to determine compliance with the NVLAP criteria. The assessment is conducted by one or more NVLAP assessors selected on the basis of their expertise in the field of testing to be reviewed. Assessors use checklists developed by NVLAP so that each laboratory receives an assessment comparable to that received by others. However, assessors have some latitude to make judgments about a laboratory's compliance with the NVLAP criteria.

Each laboratory will be contacted to arrange a mutually agreeable date for an assessment. An assessment normally takes one to three days depending on the extent of the laboratory's application. Every effort is made to conduct an assessment with as little disruption as possible to the normal operations of the laboratory. During the assessment the assessor will:

- meet with management and supervisory personnel responsible for the laboratory's activities (for which accreditation is being sought) to review the assessment process with the individuals involved and to set the assessment agenda.

- examine the quality assurance system employed by the laboratory. The assessor may select and trace the history of one or more samples from receipt to final issuance of test reports. The assessor will conduct a thorough review of the laboratory's quality manual or equivalent, evaluate the training program, examine notebooks or records pertaining to the samples, check sample identification and tracking procedures, determine whether the appropriate environmental conditions are maintained, and examine copies of completed test reports.

- review records of periodic internal audits, use of check-samples or participation in round robin testing or other similar programs.

- review personnel records including resumes and job descriptions of key personnel, competency evaluations for all staff members who routinely perform the testing for which accreditation is sought, calibration or verification records for apparatus used, test reports, and sample control records.

- observe demonstrations of testing techniques and discuss them with the technical personnel to assure their understanding of the procedures.

- examine major equipment, apparatus, and facilities for appropriateness, capability, adherance to specifications, etc.

At the conclusion of the assessment, the assessor will conduct an exit briefing to discuss observations with responsible laboratory staff. A written assessment report will be left with the laboratory. The assessor will forward the assessment forms and a copy of the report to NVLAP.

Monitoring Visits

In addition to regularly scheduled assessments, monitoring visits may be conducted by assessors or by NIST staff at any time during the accreditation period. The scope of a monitoring visit may range from checking a few designated items to a complete review. Monitoring visits may occur for cause or on a random selection basis. These visits serve to verify reported changes in the laboratory's personnel, facilities, and operations or to explore possible reasons for poor performance in proficiency testing.

Proficiency Testing

Proficiency testing is an integral part of the NVLAP accreditation process. Demonstration of appropriate facilities, equipment, personnel, etc., is essential, but may not be sufficient for a complete evaluation of laboratory competence. The actual performance of tests and reporting of results using special proficiency testing samples provides NVLAP with a way to determine the overall effectiveness of the laboratory (see Appendix C).

Proficiency testing is a process for checking actual laboratory testing performance, usually by means of inter-laboratory comparisons. Each accreditation program has unique proficiency testing requirements. The data are analyzed by NVLAP and summary reports of the results are sent to the participants.

Information obtained from proficiency testing helps to identify problems in a laboratory. When problems are found, NVLAP staff members work with the laboratory staff to solve them. If problems with the test method are suspected, NVLAP provides information to the appropriate standards writing bodies.

The specific proficiency testing requirements for this Program are included elsewhere in this document.

Deficiency Notification and Resolution

A deficiency is the failure of a laboratory to meet a NVLAP criterion. Deficiencies may be determined during on-site assessments, monitoring visits, proficiency testing, NVLAP staff review, and Technical Evaluation. Laboratories are informed of deficiencies during the on-site assessment and through other correspondence.

When a laboratory is notified by NVLAP of deficiencies, the laboratory must respond in writing to NVLAP within 30 days of the notification. The response must provide documentation, signed by the authorized representative, that the specified deficiencies have either been corrected or that specific actions are being taken to make corrections. A timetable for completion of corrections should be included.

A laboratory which is currently accredited must correct all deficiencies noted within 30 days of notification or face possible revocation, suspension, or expiration without renewal of its accreditation.

Test equipment that is identified as deficient should not be used until corrective action has been completed. Evidence of correction must be sent to NVLAP.

If substantial deficiencies have been cited, NVLAP may conduct an additional on-site assessment prior to granting accreditation. All deficiencies and resolutions will be subject to thorough review and corrective actions verified during subsequent assessments and technical evaluations.

Technical Evaluation

When a laboratory is ready for an accreditation action, a final technical evaluation is conducted by experts chosen for their experience and knowledge of the pertinent test methods. They review records on each applicant laboratory and base their evaluation on:

- information provided on the application;
- on-site assessment reports;
- actions taken by the laboratory to correct deficiencies;
- results of proficiency testing; and
- information from any monitoring visits of the laboratory.

If the technical evaluation reveals additional deficiencies, written notification describing them will be made to the laboratory. The laboratory must respond within 30 days of such notification and provide documentation, signed by the authorized representative, that the specified deficiencies have been corrected. Clarification of some issues may be requested by telephone. All deficiencies must be corrected before accreditation can be granted or renewed.

Administrative Review

After the technical evaluation has been completed, the NVLAP staff prepares an administrative recommendation that the laboratory either be granted or denied accreditation. This recommendation is based on a review of the technical evaluation and other records to ensure that all NVLAP technical, financial and administrative requirements have been satisfied.

Accreditation Actions

The following accreditation actions may be taken by NIST:

Accreditation — If accreditation is recommended, the recommendation forms the basis for granting accreditation. A **Certificate of Accreditation** and a **Scope of Accreditation** will be issued to the laboratory.

Denial — If denial is recommended, the laboratory is notified of a proposal to deny accreditation and the reason(s) therefor.

Suspension — If a laboratory is found to have violated the terms of its accreditation, the accreditation can be suspended. The laboratory will be notified of the reasons for and conditions of the suspension and the action(s) that the laboratory must take to have accreditation reinstated.

Revocation — If a laboratory is found to have violated the terms of its accreditation, the laboratory is notified of a proposal to revoke accreditation and the reasons therefor. The laboratory may be given the option of voluntarily terminating accreditation. If accreditation is revoked, the laboratory must return its **Certificate of Accreditation** and cease use of the NVLAP logo on any of its reports, correspondence, or advertising.

If denial or revocation has been proposed, the laboratory may request, in writing, a hearing, under United States Code 5 U.S.C. 556, within 30 days of the date of receipt of the notification. If a hearing is not requested, the action becomes final upon the expiration of that 30-day period.

When accreditation has been terminated, whether voluntarily or through adverse action, the accreditation certificate must be returned to NVLAP.

VI. TECHNICAL REQUIREMENTS

Section 7.33 of the NVLAP Procedures, found in Appendix A, contain the Criteria for accreditation expressed in general terms. The following interpretive comments and additional requirements make the criteria specifically applicable to the Computer Network Interface Protocols Accreditation Program for X.25. The requirements listed in Section 7.33 and those specified in this section must be met in order to gain accreditation.

Scope of the Program

The NVLAP Program for X.25 offers accreditation for testing to the DDN X.25 Data Link Layer and DDN X.25 Network Layer as given in "DDN X.25 Host Interface Specification". For information about DDN specifications, contact DCA, Code B672, Washington, DC 20305-2000, telephone (703) 285-5337.

QUALITY SYSTEM (see Procedures Sec. 7.33a)

The Quality System requirements are designed to promote laboratory practices which ensure technical integrity of the analyses and adherence to quality assurance practices. The laboratory must maintain a Quality Manual which documents the laboratory's practices and the specific steps taken to ensure quality testing. The Quality Manual must contain or refer to documentation which describes and details the laboratory's implementation of procedures covering all of the technical requirements in this section. This information will be reviewed by NVLAP assessors during on-site assessments.

The Quality Manual must contain: procedures for log-in of devices, software, and systems; description of those items; and criteria for acceptance or rejection of devices for test. The Quality System must provide for routine checks of the competence of technicians and others involved in the conduct and evaluation of tests. The Quality Manual must contain a detailed test plan for the conduct of X.25 conformance testing and describe how the laboratory assures the accuracy and consistency of its results.

The Tekelec and other hardware (see "Facilities and Equipment" below) may be used in temporary sub-facilities or may be moved from the laboratory to vendor sites. The Quality Manual must describe procedures for moving the devices and for assuring that they are in proper working order before they are used for testing.

Records must be kept of all quality assurance activities. Test data from quality assurance checks performed in the laboratory (or with other laboratories) must be summarized and retained for use by the laboratory in monitoring its performance.

The most recent release of the following documents should be available in the laboratory as reference in developing and maintaining the Quality System (see Appendix H for sources of documents).

DCA Circular Draft 370-P195-(5); "Defense Data Network Host Interface Qualification Testing - Link and Network Layers."

Defense Communications Agency Memorandum, Defense Data Network (DDN) Qualified Host Interfaces, March 1988.

DDN X.25 Host Interface Specification, December 1983.

C30/E Physical Layer Interface Guide (Network Information Center library named: "NetInfo:C30E-Interface-guide.doc").

Federal Information Processing Standards Publication (FIPS PUB 100)/Federal Standard 1041, July 1983; "Interface Between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) for Operation With Packet-Switched Data Communications Networks."

CCITT Recommendation X.25 (1980 & 1984); "Interface Between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) for Terminal Operating in Packet Mode on Public Data Networks."

Electronics Industries Association (EIA) Standard RS-232-C, Aug 1969.

Electronics Industries Association (EIA) Standard RS-449, Nov 1979 and RS-449-1, Feb 1980.

ISO 7776, INFORMATION PROCESSING SYSTEMS - High Level Data Link Control Procedures - Description of the X.25 LAPB Compatible DTE Data Link Procedures.

ISO 8208, INFORMATION PROCESSING SYSTEMS - X.25 Packet Level Protocol for DTE.

Tekelec Chameleon Users Manual, Tekelec, Inc.

STAFF (See Procedures Sec. 7.33b)

The laboratory shall maintain a complete listing of position descriptions and the staff members assigned to those positions. For each staff member, the laboratory must maintain a personnel folder which includes: a resume of qualifications, training, laboratory procedures to which assigned, and the results of periodic testing performance reviews. Performance reviews of staff members may include intra-operator tests, inter-operator tests and between-laboratory tests. The laboratory shall have a description of its training program for ensuring that staff are able to perform tests properly.

Training:

The laboratory must assure that test system operators, analysts, and administrators have adequate qualifications and training to conduct DDN X.25 Host Interface testing. At a minimum, the laboratory shall be staffed with personnel experienced/knowledgeable in the following areas:

Tekelec Chameleon Test System Operation
DDN X.25 Host Interface Specification
Data Communications
Packet Switching Networks
X.25 Qualification Test Procedures
Ability to successfully conduct qualification tests and obtain and analyze test error files, develop final test reports, and recognize and correct test errors due to improper test set-up, faulty software initialization, etc.

A laboratory must ensure that each new staff member is trained for the testing duties assigned and that staff members are retrained when they are assigned new responsibilities or when test methods are updated. Each staff member must receive (or have had) training for assigned testing duties either through on-the-job training or formal classroom sessions.

Competency:

In addition to training, the laboratory must evaluate the competency of each staff member either through an observation of performance, or an oral or written examination for each test method the staff member is authorized to conduct. The performance must be observed annually by the immediate supervisor or a designee appointed by the laboratory director, and must be adequately documented. A record of the annual evaluation of each staff member must be dated and signed by the supervisor and the employee, and placed in the personnel file.

FACILITIES AND EQUIPMENT (see Procedures Sec. 7.33c)

A laboratory must be capable of assuring that its test capability, including all hardware and software, is functioning properly. The laboratory must have a Tekelec Chameleon in its possession at all time, either through ownership or long-term lease. A second tester, tester port in the case of the Chameleon Model 32 (dual port), or other device capable of acting as a DUT is required. (See Notes 1 and 2)

The laboratory shall have at least the following hardware configuration:

- Two Tekelec Chameleon Model I, II or 32 (single port) Protocol Analyzers;
  or
  One Model 32 (dual port);
  or
  One Tekelec Chameleon Model I, II or 32 (single port) Protocol Analyzer and one other device which can act as a Device Under Test (DUT).

- Tekelec Chameleons must be equipped with the RS-232 Interface module.
- Printer with cables compatible with Chameleon models for hard copy output
- Appropriate connecting cables for test equipment
- Tekelec TE 703: RS-449 Interface Module
- RS-232 Breakout Box

Note 1 - The device which can act as a DUT may be an actual X.25 implementation or a test device similar to the Chameleon, capable of running all the required tests. However, if an actual X.25 implementation is used, there must be some additional controls available in the device so that it can be forced into specific test states. These states may or may not be experienced by the device during "normal" operation, but are critical for successful test execution.

Note 2 - Testing capabilities that are planned to be added in the future to this NVLAP program, such as AUTODIN Mode 1 protocol testing, will be written in "C" language and will be usable only on the Model 32.

The laboratory shall have the following software installed on their test system:

- Tekelec's latest release of the Installation and Operational Simulation Disks
- Latest release of the DDN X.25 Qualification Test - DTE Data Link Layer
- Latest release of the DDN X.25 Qualification Test - DTE Packet Layer For Basic Service
- Latest release of the DDN X.25 Qualification Test - DTE Packet Layer For Standard Service

NVLAP policy on main facilities and subfacilities is given in Appendix E.

CALIBRATION (see Procedures Sec. 7.33d)

Calibration requirements do not apply to the X.25 Program.

TEST METHODS AND PROCEDURES (see Procedures Sec. 7.33e)

Tests may be conducted at the vendor's or laboratory's site or other mutually agreed upon place of business with both the Tekelec test unit and the device under test (DUT) physically present. The tests for DDN X.25 Host Interface Qualification should be run in automatic mode to avoid any changes to the DUT configuration while testing.

Tekelec test units may be rented or provided by the vendor for testing outside of the laboratory. The laboratory must have detailed written procedures for all aspects of the use of these test units. In all cases, the laboratory's own DDN software disks must be used. The laboratory must verify that the version of the Tekelec system software in use has been approved by DCA.

Any errors or problems experienced with the test system or procedures should be reported in writing to DCA, Code R620, 1860 Wiehle Avenue, Reston, VA 22090, telephone (703) 437-2011.

The laboratory should not attempt to interpret DCA policy for vendors. If vendors have questions on policy or interpretation, the laboratory should direct the vendor to submit written comments on issues in question to DCA.

DCA requires that interfaces which have been tested and approved be retested whenever the product is modified. In these cases, allowances may be made by DCA for any test criteria that have been changed since the original testing. Requests should be addressed to DCA.

When a DUT has successfully passed the test, copies of the official report will be furnished to the vendor and, if requested by the vendor, to DCA for consideration for inclusion on the Defense Data Network Qualified Host interface list.

RECORDS (See Procedures Sec. 7.33f)

The laboratory shall maintain a functional record keeping system. Records must be easily accessible and contain complete information on the subject. Magnetic media must be logged and properly marked. Records covering the following are required:

- Staff training dates and results
- Staff competency review dates and results
- Test equipment name and description,
  including all Tekelec Chameleon test units used
- Manufacturer, model, and serial number of all equipment
- Test system hardware and maintenance logs
- Test system software
- Software and documentation updates
- Comprehensive logs of test activities
- Problems with test system and documentation
- Test data and official reports

Vendor test results and official reports shall be kept by the laboratory for a period of three years following the completion of testing. This includes hard copies of the official results and the test results error file. This requirement supercedes the one-year criterion stated in the NVLAP Procedures Section 7.33(f)(2).

TEST REPORTS (See Procedures Sec. 7.33g)

There are two basic types of test reports; one intended for use by the vendor only, and one that is submitted to DCA for acceptance of a network interface.

Reports intended for use only by the vendor shall meet vendor/laboratory contract obligations and be complete, but need not necessarily meet all DCA requirements. The test report must contain sufficient information for the exact test conditions to be reproduced at a later time if a retest is necessary.

Test reports to be submitted to DCA shall contain the official results from successful tests conducted by the laboratory. The report of a failed test should not be submitted to DCA.

The report shall be on letterhead with the NVLAP logo, shall be approved and signed by the laboratory manager, and contain, at a minimum, the following information:

Name and address of the laboratory;
Pertinent dates and identifying numbers;
Name of vendor;
Vendor information sheet and DCAC pretest questionnaire;
Description and name, model, serial no. of DUT;
Any deviations from the test methods;
Test results and comments related to passing criteria;
Signature of NVLAP approval signatory and
All other items required by the test methods.

VII. PROFICIENCY TESTING

Proficiency testing is an integral requirement of the NVLAP process. Applicant laboratories will be required to participate satisfactorily in proficiency testing prior to initial accreditation and annually thereafter. Laboratories renewing accreditation must have satisfactorily participated in all required proficiency testing during their previous accreditation period (see Appendix C).

To evaluate the effective and proper operation of a laboratory, proficiency testing may consist of several parts. The proficiency testing concept is designed to allow the evaluation of the laboratory's ability to produce repeatable and reproducible test data. Portions of the testing process may be "highlighted" in proficiency testing, eg., software, hardware, data analysis, etc. Proficiency testing may include:

1) Testing on a sample "device under test (DUT)" to demonstrate the laboratory's ability to properly perform test procedures and operations. Initially, the DUT will be the Tekelec Chameleon, running in SITREX mode.

2) Analyzing and developing final test reports from sample test files, provided by NVLAP, which contain characteristics that are unknown to the laboratory. These test files will be specially generated for proficiency testing purposes.

3) A DUT may be shipped to the laboratory for testing, analysis, and return to NVLAP. Instructions sent with the DUT will explain how the device is to be tested.

4) Laboratory access via telephone lines to a remote host simulator (DUT).

The results of the proficiency testing program will be reported to the participants in appropriate documents and reports. The identities and performance of individual laboratories will remain confidential.

The results of proficiency testing will be made available to on-site assessors for use during laboratory assessment visits. If problems are indicated by proficiency testing, they will be discussed with appropriate laboratory personnel, who will then be responsible for developing and implementing plans for resolving the problems.

Deficiencies identified by proficiency testing, whether during an on-site or not, must be resolved in a manner similar to the process for on-site deficiency resolution.

VIII. ON-SITE ASSESSMENT

A laboratory must undergo a successful on-site assessment and resolve any deficiencies (departures from the NVLAP criteria) noted during the assessment before accreditation can be initially granted for the X.25 protocol. Deficiencies noted during subsequent on-sites must be resolved in order to maintain accreditation.

The laboratory should be in good working order and prepared to demonstrate testing using the Tekelec Chameleon system. All observations made by the NVLAP assessor are held in strictest confidence.

The assessor will use NVLAP checklists containing specific questions about all aspects of the visit. The checklists, based on the NVLAP criteria for accreditation and the Critical Elements for X.25 (see Appendix G), serve to ensure a complete assessment and that all assessors cover the same items at each laboratory. The assessor will need to take breaks during the day to fill in the NVLAP checklists and to prepare the Assessment Report.

The laboratory will be responsible for demonstrating its competence to interpret the testing requirements for X.25, set up the Tekelec and DUT, conduct the test, analyze the test data, and prepare a test report.

The agenda for a typical one-day on-site visit is given below.

1. Assessor conducts an entry briefing with laboratory manager to explain the purpose of the on-site and to discuss the schedule for the day. At the discretion of the laboratory manager, other staff may attend the briefing.

2. Assessor reviews equipment and maintenance records, software versions, record keeping procedures, quality-system manuals, laboratory test reports, and personnel competency records. Although there must be a laboratory staff member available to answer questions, the assessor may wish to review the documents alone. The assessor does not usually ask to take any laboratory documents with him.

3. Assessor physically examines equipment and facilities. Assessor observes the demonstration of selected procedures and interviews the personnel. The demonstrations must include "device under test" set-up and the use of all major equipment. The assessor may request a specific demonstration for use as a Proficiency Test.

4. An exit briefing is held with the laboratory manager and staff to discuss the assessor's findings. Deficiencies are discussed and resolutions are mapped out. Items that must be addressed before accreditation can be granted are emphasized. Items that have been corrected during the on-site and any recommendations are specially noted.

5. As a part of the exit briefing, the assessor completes an Assessment Report detailing his findings. This report is signed by the assessor and the laboratory representative and a copy is given to the representative.

APPENDICES

A - NVLAP Procedures, Subpart D,
"Conditions and Criteria for Accreditation"

B - NVLAP POLICY GUIDES

#10 - Main laboratory facilities and sub-facilities

#11 - "Use of Subcontractors by Accredited Laboratories"

#12 - "Test Reports Issued by Accredited Laboratories"

#13 - "Satisfactory Proficiency Testing Is a Requirement for Accreditation"

#14 - "Accreditation of Foreign Laboratories"

C - NVLAP LAB BULLETINS

D - Sample Certificate of Accreditation
Sample Scope of Accreditation

E - Federal Register Notice, July 21, 1988
Formal establishment of the Protocols Program

F - Critical Elements

G - Sources of Documents

APPENDIX A

NVLAP PROCEDURES

NVLAP PROCEDURES - TITLE 15, PART 7, CODE OF FEDERAL REGULATIONS

SUBPART D - CONDITIONS AND CRITERIA FOR ACCREDITATION

Sec. 7.31 Application of accreditation conditions and criteria.

(a) To become accredited and maintain accreditation, a laboratory must meet the conditions for accreditation set out in Section 7.32 and the criteria set out in Section 7.33 as tailored for specific LAPs.

(b) The conditions leading to accreditation include acceptance of the responsibilities of an accredited laboratory and requirements for information disclosure.

(c) The criteria are tailored and interpreted for the test methods, types of test methods, products, services or standards of the relevant LAP. These tailored criteria are the technical requirements for accreditation developed through the procedures of Section 7.15.

(d) In applying the conditions, criteria, and technical requirements for accreditation, the Director of OPSP shall not:

(1) Prohibit accreditation solely on the basis of a laboratory's affiliation or nonaffiliation with manufacturing, distributing, or vending organizations, or because the laboratory is a foreign firm; or
(2) Develop, modify, or promulgate test methods, standards, or comparable administrative rules.

Sec. 7.32 Conditions for accreditation.

(a) To become accredited and maintain accreditation, a laboratory shall agree in writing to:

(1) Be assessed and evaluated initially and on a periodic basis;
(2) Demonstrate, on request, that it is able to perform the tests representative of those for which it is seeking accreditation;
(3) Pay all relevant fees;
(4) Participate in proficiency testing as required.
(5) Be capable of performing the tests for which it is accredited according to the latest version of the test method within one year after its publication or within another time limit specified by the Director of OPSP;
(6) Limit the representation of the scope of its accreditation to only those tests or services for which accreditation is granted;
(7) Limit all its test work or services for clients to those areas where competence and capacity are available;
(8) Limit advertising of its accredited status to letterheads, brochures, test reports, and professional, technical, trade, or other laboratory services publications, and use the NVLAP logo under guidance provided by the Director of OPSP;

(9) Inform its clients that the laboratory's accreditation or any of its test reports in no way constitutes or implies product certification, approval, or endorsement by NBS;
(10) Maintain records of all actions taken in response to testing complaints for a minimum of one year;
(11) Maintain an independent decisional relationship between itself and its clients, affiliates, or other organizations so that the laboratory's capacity to render test reports objectively and without bias is not adversely affected;
(12) Report to the Director of OPSP within 30 days any major changes involving the location, ownership, management structure, authorized representative, approved signatories, or facilities of the laboratory; and
(13) Return to the Director of OPSP the certificate of accreditation for possible revision or other action should it:
(i) be requested to do so by the Director of OPSP;
(ii) voluntarily terminate its accredited status; or
(iii) become unable to conform to any of these conditions or the applicable criteria of Section 7.33 and related technical requirements.

(b) To become accredited and maintain accreditation, a laboratory shall supply, upon request, the following information:
(1) Legal name and full address;
(2) Ownership of the laboratory;
(3) Organization chart defining relationships that are relevant to performing testing covered in the accreditation request;
(4) General description of the laboratory, including its facilities and scope of operation;
(5) Name and telephone number of the authorized representative of the laboratory;
(6) Names or titles and qualifications of laboratory staff nominated to serve as approved signatories of test reports that reference NVLAP accreditation; and
(7) Other information as may be needed for the specific LAP(s) in which accreditation is sought.

Sec. 7.33 Criteria for accreditation.

(a) Quality System.
(1) The laboratory shall operate under an internal quality assurance program appropriate to the type, range, and volume of work performed. The quality assurance program must be designed to ensure the required degree of accuracy and precision of the laboratory's work and should include key elements of document control, sample control, data validation, and corrective action. The quality assurance program must be documented in a quality manual or equivalent (e.g., operations notebook) which is available for use by laboratory staff. A person(s) must be identified as having responsibility for maintaining the quality manual.

(2) The quality manual must include as appropriate:
  (i) The laboratory's quality assurance policies including procedures for corrective action for detected test discrepancies;
  (ii) Quality assurance responsibilities for each function of the laboratory;
  (iii) Specific quality assurance practices and procedures for each test, type of test, or other specifically delineated function performed;
  (iv) Specific procedures for retesting, control charts, reference materials, and interlaboratory tests; and
  (v) Procedures for dealing with testing complaints.

(3) The laboratory shall periodically review its quality assurance system by or on behalf of management to ensure it's continued effectiveness. These reviews must be recorded with details of any corrective action taken.

(b) Staff.

(1) The laboratory shall:
  (i) Be staffed by individuals having the necessary education, training, technical knowledge, and experience for their assigned functions; and
  (ii) Have a job description for each professional, scientific, supervisory and technical position, including the necessary education, training, technical knowledge, and experience.

(2) The laboratory shall document the test methods each staff member has been assigned to perform.

(3) The laboratory shall have a description of its training program for ensuring that new or untrained staff are able to perform tests properly and uniformly to the requisite degree of precision and accuracy.

(4) The laboratory shall be organized:
  (i) So that staff members are not subjected to undue pressure or inducement that might influence their judgment or results of their work; and
  (ii) In such a way that staff members are aware of both the extent and the limitation of their area of responsibility.

(5) The laboratory shall have a technical manager (or similar title) who has overall responsibility for the technical operations of the laboratory.

(6) The laboratory shall have one or more signatories approved by the Director of OPSP to sign test reports that reference NVLAP accreditation. Approved signatories shall:
  (i) Be competent to make a critical evaluation of test results; and
  (ii) Occupy positions within the laboratory's organization which makes them responsible for the adequacy of test results.

(c) Facilities and Equipment.

(1) The laboratory shall be furnished with all items of equipment and facilities for the correct performance of the tests and measurements for which accreditation is granted and shall have adequate space, lighting, and environmental control, and monitoring to ensure compliance with prescribed testing conditions.

(2) All equipment must be properly maintained to ensure protection from corrosion and other causes of deterioration. Instructions for a proper maintenance procedure for those items of equipment which require periodic maintenance must be available. Any item of equipment or component thereof

which has been subjected to overloading or mishandling, gives suspect results, or has been shown by calibration or otherwise to be defective, must be taken out of service and clearly labelled until it has been repaired. When placed back in service, this equipment must be shown by test or calibration to be performing its function satisfactorily.

(3) Records of each major item of equipment must be maintained. Each record must include:

(i) The name of the item of equipment;
(ii) The manufacturer's name and type, identification and serial number;
(iii) Date received and date placed in service;
(iv) Current location, where appropriate;
(v) Details of maintenance; and
(vi) Date of last calibration, next calibration due date, and calibration report references.

(d) Calibration. The laboratory shall:

(1) Calibrate new testing equipment before putting it into service;
(2) Recalibrate, at regular intervals, in-service testing equipment with the calibration status readily available to the operator;
(3) Perform checks of in-service testing equipment between the regular calibration intervals, where relevant;
(4) Maintain adequate records of all calibrations and recalibrations; and
(5) Provide traceability of all calibrations and reference standards of measurement where these standards exist. Where traceability of measurements to primary (national or international) standards is not applicable, the laboratory shall provide satisfactory evidence of the accuracy or reliability of test results (e.g., by participation in a suitable program of interlaboratory comparison).

(e) Test Methods and Procedures. The laboratory shall:

(1) Conform in all respects with the test methods and procedures required by the specifications against which the test item is to be tested, except that whenever a departure becomes necessary for technical reasons the departure must be acceptable to the client and recorded in the test report;
(2) Have data to prove that any departures from standard methods and/or procedures due to apparatus design or for other reasons do not detract from the expected or required precision of the measurement;
(3) Maintain a test plan for implementing testing standards and procedures including adequate instructions on the use and operation of all relevant equipment, on the handling and preparation of test items (where applicable), and on standard testing techniques where the absence of such instructions could compromise the test. All instructions, testing standards, specifications, manuals, and reference data relevant to the work of the laboratory must be kept up-to-date and made readily available to the staff;
(4) Maintain measures for the detection and resolution of in-process testing discrepancies for manual and automatic test equipment and electronic data processing equipment, where applicable;

(5) Maintain a system for identifying samples or items to be tested, which remains in force from the date of receipt of the item to the date of its disposal, either through documents or through marking to ensure that there is no confusion regarding the identity of the samples or test items and the results of the measurements made; and
(6) Maintain rules for the receipt, retention, and disposal of test items, including procedures for storage and handling precautions to prevent damage to test items which could invalidate the test results. Any relevant instructions provided with the tested item must be observed.

(f) Records. The laboratory shall:
(1) Maintain a record system which contains sufficient information to permit verification of any issued report;
(2) Retain all original observations, calculations and derived data, and calibration records for one year unless a longer period is specified; and
(3) Hold records secure and in confidence, as required.

(g) Test Reports.
(1) The laboratory shall issue test reports of its work which accurately, clearly, and unambiguously present the specified test results and all required information. Each test report must include the following information as applicable:
(i) Name and address of the laboratory;
(ii) Identification of the test report by serial number, date, or other appropriate means;
(iii) Name and address of client;
(iv) Description and identification of the test specimen, sample, or lot of material represented;
(v) Identification of the test specification, method, or procedure used;
(vi) Description of sampling procedure, if appropriate;
(vii) Any deviations, additions to, or exclusions from the test specifications;
(viii) Measurements, examinations, and derived results supported by tables, graphs, sketches, and photographs, as appropriate, and any failures identified;
(ix) A statement of measurement uncertainty, where relevant;
(x) Identification of the organization and the person accepting technical responsibility for the test report and date of issue;
(xi) A statement that the report must not be reproduced except in full with the approval of the laboratory; and
(xii) A statement to the effect that the test report relates only to the items tested.
(2) The laboratory shall issue corrections or additions to a test report only by a further document suitably marked, e.g. "Supplement to test report serial number .....," which meets the relevant requirements of Section 7.33(g)(1).
(3) The laboratory shall retain a copy of each test report issued for one year unless a longer period is specified by the Director of OPSP.
(4) The laboratory shall ensure that all test reports endorsed with the NVLAP logo are signed by an approved signatory.

APPENDIX B

NVLAP POLICY GUIDES

U.S. Department of Commerce
National Institute of Standards and Technology

NVLAP

National Voluntary Laboratory Accreditation Program

POLICY GUIDE

Number 10
June 1988
(Reprinted June 1989)

This Policy Guide presents NVLAP definitions of the types of laboratory facilities which may be granted NVLAP accreditation, the requirements and conditions that must be satisfied in order to achieve accreditation, and procedures that NVLAP will follow in evaluating various types of facilities for their conformance to accreditation criteria.

Definitions:

a. Main (laboratory) facility:

(1) permanently (at all times) maintains staff, equipment, procedures, documentation, and facilities necessary to perform the tests, for which it seeks accreditation;
(2) implements all quality assurance procedures;
(3) maintains and retains all records, and issues test reports; and
(4) may be a permanently fixed site or a permanent mobile facility.

b. Sub-facility is physically separate from, but considered an extension of, its main facility. Although it may have all staff, equipment, procedures, and documentation necessary to perform the requisite tests, it receives technical direction and quality assurance management from the main facility.

1. A permanent sub-facility maintains staff, equipment, procedures, documentation, and facilities necessary to perform the tests, for which it seeks accreditation, at all times. It may be a permanently fixed site or a permanent mobile facility and is expected to remain in operation for at least one year.

2. A temporary sub-facility is provided with staff, equipment, procedures, documentation, and facilities necessary to perform the tests, for which it seeks accreditation, on an interim basis, to meet the needs of the main facility. A temporary sub-facility may be established at a fixed site or in a mobile facility and is expected to remain in operation less than one year.

Conditions for Accreditation:

NVLAP accreditation of a laboratory main facility does not extend to accreditation of sub-facilities unless the sub-facilities have been separately evaluated. These facilities are uniquely identified in the NVLAP accreditation

documents. A NVLAP-accredited laboratory must not present or report test data, produced at any non-accredited, sub-facility as having been produced under the status of NVLAP accreditation.

NVLAP offers accreditation to laboratories that are found competent to perform specific test methods or types of tests in specified fields of testing. Competence is defined as the ability to meet specific technical criteria relating to quality assurance, staff, equipment, facilities, procedures, records, and reports. Technical criteria may or may not be equally applicable to main facilities and sub-facilities. Accreditation of sub-facilities may require NVLAP criteria that address the use and maintenance of equipment and facilities, and the implementation of procedures, that are particularly applicable to the performance of specific test methods in sub-facilities. NVLAP must develop specific technical criteria upon which to base an objective evaluation of staff, facilities, equipment, and procedures employed in applicable sub-facilities.

NVLAP will accredit a main facility if the facility complies with all applicable NVLAP criteria.

NVLAP will accredit a sub-facility (in addition to the main facility) if:

a. the laboratory main facility meets all NVLAP accreditation criteria;

b. the laboratory main facility satisfactorily documents and maintains quality assurance procedures addressing the applicable sub-facility; and,

c. the sub-facility complies with all applicable NVLAP criteria.

Procedures:

In principle, NVLAP will require that sub-facilities, to be included in a laboratory's accreditation, undergo on-site assessments and participate in proficiency testing. NVLAP staff, with the guidance of NVLAP technical experts, will determine the need for and extent of such evaluations based on the number and location of similar sub-facilities managed by the laboratory, the nature of the quality assurance system, and any special technical considerations. Decisions on the need for and extent of the evaluations may not be made until after the accreditation of the main facility. **The conditions and requirements for evaluation of sub-facilities providing specific testing services are described in NVLAP documents pertaining to the relevant accreditation program.**

Laboratories seeking NVLAP accreditation should clearly state, on the NVLAP Application Form, what type(s) of sub-facilities are to be included in the accreditation. NVLAP fees for on-site assessments and proficiency testing will be based on the number of facilities seeking accreditation that are required to undergo on-sites and participate in proficiency testing. A single administrative/technical support fee is charged to the laboratory (main facility).

U.S. Department of Commerce
National Institute of Standards and Technology

NVLAP

National Voluntary Laboratory Accreditation Program

POLICY GUIDE

Number 11
March 1989

USE OF SUBCONTRACTORS BY ACCREDITED LABORATORIES

When a laboratory accredited by NVLAP issues a test report containing the NVLAP logo or other indication of NVLAP accreditation, it is implied that the report reflects work performed, and results obtained, by the personnel, equipment, and procedures of that laboratory. However, in some cases a laboratory may require the use of another facility (subcontractor) e.g., due to equipment failure, need for specialized equipment, work overload, or to perform tests outside the laboratory's scope, etc., in order to meet contractual obligations.

The following policy applies whenever the NVLAP logo or other reference to a laboratory's accredited status is used on a test report.

NVLAP POLICY. Whenever a laboratory accredited by NVLAP subcontracts to another laboratory the performance of any test or portion of a test it must clearly identify in its records, and in the report to the client, specifically which test method(s) or portion of a test method(s) were performed by the accredited laboratory and which were performed by the subcontractor. The laboratory must also inform the client, before the fact, that subcontracting will be necessary.

Definition of SUBCONTRACTOR: Any facility not covered under a laboratory's NVLAP accreditation, as defined in the accreditation documents, utilized by the laboratory to produce test data, e.g., laboratories not affiliated with the NVLAP laboratory, facilities within the same corporate structure that are not included in the accreditation, such as franchises, or subsidiaries.

REQUIREMENTS NVLAP policy regarding an accredited laboratory subcontracting any test or portion of a test which will reference the laboratory's accredited status requires the following of an accredited laboratory.

1. The laboratory's policy regarding the use of subcontractors must be included in the Quality Assurance Manual.

2. The laboratory must notify the client that some testing will be subcontracted (identity of subcontractor not required in advance).

3. Any test report issued that contains data produced by a subcontractor and displays the NVLAP logo or other indication of NVLAP accreditation, must include:

Subcontractor ACCREDITED by NVLAP

- a statement at the begining of the report prominently indicating
  " This report contains data which was produced by a subcontracted laboratory accredited by NVLAP for the test methods performed";
- clear indication of which data was produced by the subcontractor;
- name, address, and contact person of the subcontracted facility(ies);
- the NVLAP lab code of the subcontractor(s);
- a description of the test(s) performed, and results obtained.

Subcontractor NOT ACCREDITED by NVLAP

- a statement at the begining of the report prominently indicating
  " This report contains data which was produced by a subcontracted laboratory which is not accredited by NVLAP ";
- clear indication of which data was produced by the subcontractor;
- name, address, and contact person of the subcontracted facility(ies);
- a description of the test(s) performed; and results obtained;

U.S. Department of Commerce
National Institute of Standards and Technology

NVLAP

National Voluntary Laboratory Accreditation Program

POLICY GUIDE

Number 12
April 1989

TEST REPORTS ISSUED BY ACCREDITED LABORATORIES

When a laboratory accredited by NVLAP issues a test report containing the NVLAP logo or other indication of NVLAP accreditation, it is implied that the report reflects work performed, and results obtained, under the conditions of the accreditation. Frequently however, laboratories perform other testing which is not covered by the NVLAP accreditation.

NVLAP POLICY. Whenever a laboratory accredited by NVLAP issues a test report which contains data from the performance of any test or portion of a test not covered by the accreditation it must clearly identify in its records, and in the report to the client, specifically which test method(s) or portion of a test method(s) were not covered by the accreditation. The laboratory must also inform the client, before the fact, when tests requested are not covered by the accreditation.

REQUIREMENTS. NVLAP policy regarding test reports issued by an accredited laboratory which references the laboratory's accredited status, requires the following.

1) Any test report that contains data from tests which are not covered by the accreditation must include:

   - a statement at the beginning of the report prominently indicating " This report contains data which is not covered by the NVLAP accreditation";

   - clear indication of which data is not covered by the accreditation

2) A description of the laboratory's policy regarding the use of the NVLAP logo must be included in the Quality Assurance Manual.

3) The laboratory must not misrepresent its accreditation. When a client requires or requests accredited services and any of the requested services are not covered by the accreditation, the client must be so advised.

U.S. Department of Commerce
National Institute of Standards and Technology

NVLAP

National Voluntary Laboratory Accreditation Program

POLICY GUIDE

Number 13
July 1989
(Replaces Policy Bulletin No. 19)

SATISFACTORY PROFICIENCY TESTING IS A REQUIREMENT FOR ACCREDITATION

Accreditation by the National Institute of Standards and Technology, under the National Voluntary Laboratory Accreditation Program (NVLAP), requires that a laboratory meet all performance requirements and criteria as determined by on-site assessments and proficiency testing.

If, as the result of on-site assessments, deficiencies are found, the laboratory must satisfactorily resolve those deficiencies, in order to obtain initial accreditation or maintain accreditation.

Unsatisfactory participation in any NVLAP proficiency testing program is a technical deficiency which must be resolved in order to obtain initial accreditation or maintain accreditation.

Unsatisfactory participation in NVLAP proficiency testing programs is defined as, but not limited to, one or more of the following:

1. Failure to meet specified proficiency testing performance requirements prescribed by a standard or test method for which the laboratory is seeking accreditation. (Example: ANSI Standard N13.11 for the Dosimetry Program.)

2. Failure to participate in a regularly scheduled "round" of proficiency testing for which the laboratory has received instructions and/or materials.

3. Failure to submit laboratory control data as required.

4. Performance as a statistically outlying laboratory in two successive rounds of proficiency testing or showing a general pattern of outlying test results over three or more rounds.

5. Failure to produce test data within acceptable limits of error when testing NIST Standard Reference Materials or special artifacts whose properties are well characterized and known to NIST/NVLAP.

NVLAP will notify the laboratory of proficiency testing deficiency(s) and actions to be taken to resolve the deficiency(s). Denial or suspension of accreditation will result from failure to resolve deficiencies.

U.S. Department of Commerce
National Institute of Standards and Technology

NVLAP

National Voluntary Laboratory Accreditation Program

POLICY GUIDE

Number 14
July 1989
(Replaces Policy Bulletin No. 4)

ACCREDITATION OF FOREIGN LABORATORIES

Foreign laboratories, located outside of the continental United States, may be accredited by NVLAP on the same basis as U.S. domestic laboratories. Foreign laboratories must meet the same requirements and criteria as domestic laboratories. The criteria are defined in the NVLAP Procedures and technical Handbooks provided to all applicants. Accreditation is granted based on compliance with all NVLAP criteria as determined by on-site assessments and the results of proficiency testing programs.

Since NVLAP is a cost-reimbursable program, the fees charged foreign laboratories must cover all costs in excess of those associated with the accreditation of domestic laboratories. Additional fees will be charged to foreign laboratories for travel by assess outside of the United States and for shipment of proficiency testing materials to the laboratories.

Upon application, a foreign laboratory must forward payment of NVLAP fees (as calculated on the Fee Calculation Sheet) in U.S. currency. The laboratory will be notified of additional travel and proficiency testing costs which must be paid to NVLAP before an assessor leaves to perform the on-site assessment.

In cases where laboratory documents are not in English, or laboratory personnel do not speak English, it is the responsibility of the laboratory to provide a translator to assist the NVLAP assessor during the inspection. The translator will assist the assessor to converse directly with laboratory management and technical staff and to review laboratory documentation. Documents such as quality control manuals, protocols, standards, and test reports need not be translated into English solely for NVLAP purposes.

An export license, issued by the U.S. Department of Commerce, may be required for certain equipment to be sold outside the United States. If a foreign laboratory applying for NVLAP accreditation must own the required equipment, the laboratory must have a valid export license. For export license information call (202) 377-4811 or write to: U.S. Department of Commerce, Export Administration, Exporter Assistance, P.O. Box 273, Washington, DC 20230.

APPENDIX C

NVLAP LAB BULLETINS

There are currently no NVLAP LAB BULLETINS for that apply to this Program.

APPENDIX D

SAMPLE CERTIFICATE AND SCOPE OF ACCREDITATION

United States Department of Commerce
National Institute of Standards and Technology

NVLAP

Certificate of Accreditation

LABORATORY, INC.
ANYTOWN, MD

is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 7 Code of Federal Regulations. Accreditation is awarded for specific services, listed on the Scope of Accreditation, for:

COMPUTER NETWORK INTERFACE PROTOCOLS

January 1, 19--
Effective until

For the National Institute of Standards and Technology

National Institute of Standards and Technology

NVLAP

National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION

COMPUTER NETWORK INTERFACE PROTOCOLS

NVLAP LAB CODE 0000

LABORATORY, INC.
1 Main Street, Anytown, MD 00000
John Doe Phone: 301-555-1212

Accreditation Renewal Date: January 1, 19--

NVLAP Test Method Code	Test Method Designation
17/H01	Department of Defense Military Standard Data Communications High Level Protocols, per Defense Communications Agency Upper Level Protocol Test System: Mil-Std 1777 Internet Protocol Mil-Std 1778 Transmission Control Protocol Mil-Std 1780 File Transfer Protocol Mil-Std 1781 Simple Mail Transfer Protocol Mil-Std 1782 TELNET Protocol
17/X25	Defense Data Network X.25 Host Interface Qualification Tests per Defense Communications Agency Circular 370-P195-(5)

For the National Institute of Standards and Technology

APPENDIX E

Federal Register Notice, July 21, 1988
Formal establishment of the Protocols Program

National Bureau of Standards

[Docket No. 80741-8141]

National Voluntary Laboratory Accreditation Program

AGENCY: National Bureau of Standards, Commerce.

ACTION: Notice of formal establishment of a laboratory accreditation program for laboratories that test the computer industry's implementation of communications protocols used by the Department of Defense.

SUMMARY: Under the National Voluntary Laboratory Accreditation Program (NVLAP), the National Bureau of Standards (NBS) announces the establishment of a laboratory accreditation program for laboratories that test the computer industry's implementation of communications protocols used by the Department of Defense (Protocols Program). Laboratories that are interested in becoming accredited under the Protocols Program may indicate their interest in the program by informing the Manager, Laboratory Accreditation, National Bureau of Standards of their specific interests.

FOR FURTHER INFORMATION CONTACT: John L. Donaldson, Manager, Laboratory Accreditation, National Bureau of Standards, Admin A527, Gaithersburg, MD 20899, (301) 975-4016.

SUPPLEMENTARY INFORMATION:

Background

This notice is issued in accordance with § 7.17 of the NVLAP Procedures (15 CFR Part 7). Establishment of this program for laboratories that test the computer industry's implementation of communications protocols used by the Department of Defense follows a request by the Defense Communications Agency. A Federal Register notice announcing the request for the Protocols LAP was published on December 3, 1987 (50 FR 45986-45988). Comments received in response to the announcement were reviewed by the Defense Communications Engineering Center whose director, Warren P. Hawrylko, has concluded that there were no valid reasons presented in the comment letters to prevent establishment of the Protocols LAP and therefore requested the National Bureau of Standards to proceed to establish the requested program.

The purpose of the LAP is to accredit and provide national recognition to laboratories capable of performing tests in accordance with the designated test methods. The scope of the LAP includes testing services for: (1) Defense Data Network (DDN) X.25 Link and Network Layer Protocols as specified in the DCA DDN X.25 Host Interface Specification; (2) the five DoD packet switching High Level Protocols (HLPs): (I) Internet Protocol (IP) MIL-STD 1777; (II) Transmission Control Protocol (TCP), MIL-STD 1778; (III) File Transfer Protocol (FTP), MIL-STD 1780; (IV) Simple Mail Transfer Protocol, MIL STD 1781; and (V) TELNET, MIL-STD 1782; and (3) the AUTODIN Mode I Protocol. Accreditation will be offered first for the X.25 protocol. Accreditation will be offered next, at least 45 days later, for the DoD HLPs (I)-(V). Accreditation for AUTODIN Mode I protocol will be offered last, after the initial X.25 protocol accreditations have been completed.

Procedure Prior to Application

Any testing laboratory interested in becoming accredited under this LAP should contact the Manager, Laboratory Accreditation, at the address shown above, specifying the protocols of interest. The laboratory will be sent the proposed technical documents for the requested protocol accreditation as they become available and will be invited to submit comments for their revision within 45 days of the publication date of this notice in the case of the X.25 protocol and of the mailing dates of the documents for the HLP and AUTODIN protocols. A meeting of all interested parties will be scheduled after each of the closing dates to resolve conflicting comments. If none arise, no meeting will be scheduled. The completed technical documents, instructions, fee schedules, and applications will be sent separately for each protocol as they become available to all laboratories that have previously requested them.

Earnest Ambler,

Director.

Dated: July 15, 1988.

[FR Doc. 88-16439 Filed 7-20-88; 8:45 am]

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APPENDIX F

CRITICAL ELEMENTS

880915

National Voluntary Laboratory Accreditation Program (NVLAP)
Computer Network Interface Protocols - X.25

CRITICAL ELEMENTS

NVLAP TEST METHOD DESIGNATION: 17/X25

TEST METHOD: DDN X.25 Data Link Layer

TEST METHOD SCOPE: To ensure that the data link layer protocol of the Device Under Test (DUT) conforms with the DDN X.25 Host Interface Specification, dated December 1983.

ENVIRONMENTAL/TEST SAMPLE CONDITIONING: N/A

TEST EQUIPMENT AND APPARATUS:

1. Two Tekelec Chameleon Model I, II, or 32 (single port) or one Model 32 (dual port) protocol analyzer(s).
2. Printer connected to Tekelec Chameleon for printing test reports and error files.
3. Necessary cables (i.e RS-232, RS-449/422) to physically connect the DUT to the Tekelec Chameleon.

TESTING PROCEDURES: (Reference: DCA Circular 370-P195-(5), Supplement 1)

1. Examine Pretest Questionnaire to determine appropriate test setup. (Ref: Chapter 13.)
2. Physical connection between DUT and test hardware. (Ref: Chapter 3.)
3. Test device setup. (Ref: Chapter 14, para 2.a and 3)
4. Software initialization/test execution. (Ref: Chapter 4, para 2.a - 2.j)
5. Print error report and examine error files. (Ref: Chapter 4, para 2.b, 2.h - 2.i.)

TEST REPORTS:

1. Contain all information required by client or by DCA

SPECIAL CONSIDERATIONS:

1. Proficiency testing is required.
2. Test setup is in accordance with pretest questionnaire.
3. Proper software and software initialization are chosen.
4. Hard copies of test report and error files are obtained.
5. File names for test results, test report, and error files are logged in records and saved on storage media for future reference.
6. All deviations appearing in error files are accompanied by monitor traces.

880915

National Voluntary Laboratory Accreditation Program (NVLAP)
Computer Network Interface Protocols - X.25

CRITICAL ELEMENTS

NVLAP TEST METHOD DESIGNATION:

TEST METHOD: DDN X.25 Network Layer

TEST METHOD SCOPE: To ensure that the network protocol of the Device Under Test (DUT) conforms with the DDN X.25 Host Interface Specification, dated December 1983.

ENVIRONMENTAL/TEST SAMPLE CONDITIONING: N/A

TEST EQUIPMENT AND APPARATUS:

1. Two Tekelec Chameleon Model I, II, or 32 (single port) or one Model 32 (dual port) protocol analyzer(s).
2. Printer connected to Tekelec Chameleon for printing test reports and error files.
3. Necessary cables (i.e RS-232, RS-449/422) to physically connect the DUT to the Tekelec Chameleon.

TESTING PROCEDURES: (Reference: DCA Circular 370-P195-(5), Supplement 1)

1. Examine Pretest Questionnaire to determine appropriate test setup. (Ref: Chapter 13.)
2. Physical connection between DUT and test hardware. (Ref: Chapter 3.)
3. Test device setup. (Ref: Chapter 14, para 2.b and 3)
4. Software initialization/test execution. (Ref: Chapter 4, para 3.a - 3.j)
5. Print error report and examine error files. (Ref: Chapter 4, para 3.b, 3.h - 3.i.)

TEST REPORTS:

1. Contain all information required by client or by DCA

SPECIAL CONSIDERATIONS:

1. Proficiency testing is required.
2. Test setup is in accordance with pretest questionnaire.
3. Proper software and software initialization are chosen.
4. Hard copies of test report and error files are obtained.
5. File names for test results, test report, and error files are logged in records and saved on storage media for future reference.
6. All deviations appearing in error files are accompanied by monitor traces.

APPENDIX G

SOURCES OF DOCUMENTS

SOURCES OF DOCUMENTS

The following documents are available from: DCA, Code B672, Washington, DC 20305-2000, telephone (703) 285-5337

- DCA Circular Draft 370-P195-(5)
- DCA Memorandum, DDN Qualified Host Interfaces

The following documents are available from: National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, telephone (703) 487-4650

- CCITT Recommendation X.25 (1980 & 1984)
- DDN X.25 Host Interface Specification, December 1983.
- FIPS PUB 100
- C30/E Physical Layer Interface Guide - Draft (NTIS order AD-A207865)

The following documents are available from: American National Standards Institute, 1430 Broadway, New York, NY 10018, telephone (212) 354-3300

- ISO 7776
- ISO 8208

The following documents are available from: Electronics Industries Association, 2001 I Street, NW, Washington, DC 20006, telephone (202) 457-4900

- EIA Standard RS-232-D
- EIA Standard RS-449

The following documents are available from: Tekelec Customer Services, 26540 Agoura Road, Calabasas, CA 91302, telephone (818) 880-5656

- Tekelec Chameleon Users Manuals

Some of the documents listed above are available to DoD agencies and DoD contractors from: Defense Technical Information Center (DTIC), Cameron Station, Alexandria, VA 22304-6145, telephone (703) 274-7633

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5. AUTHOR(S)

Jeffrey Horlick

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U.S. DEPARTMENT OF COMMERCE
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
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10. SUPPLEMENTARY NOTES

[ ] DOCUMENT DESCRIBES A COMPUTER PROGRAM; SF-185, FIPS SOFTWARE SUMMARY, IS ATTACHED.

11. ABSTRACT (A 200-WORD OR LESS FACTUAL SUMMARY OF MOST SIGNIFICANT INFORMATION. IF DOCUMENT INCLUDES A SIGNIFICANT BIBLIOGRAPHY OR LITERATURE SURVEY, MENTION IT HERE.)

This document explains the operational and technical requirements of the National Voluntary Laboratory Accreditation Program for Computer Network Interface Protocol testing. All of the steps leading to the accreditation are discussed. Technical requirements are explained indicating how the NVLAP criteria are applied.

This Handbook is intended for use by the staff of accredited laboratories, those seeking accreditation, other laboratory accreditation systems, and others needing information on the requirements for NVLAP accreditation under this program.

12. KEY WORDS (6 TO 12 ENTRIES; ALPHABETICAL ORDER; CAPITALIZE ONLY PROPER NAMES; AND SEPARATE KEY WORDS BY SEMICOLONS)

accreditation; assessment; computer network; laboratory; networks; NVLAP; proficiency testing; protocols; X.25

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