



U. S. General Accounting Office

# Federal Telecommunications Profile Procedures and Practices (Enclosure B)

## Introduction

The U.S. General Accounting Office is an independent agency of the Congress. We are compiling a profile of federal telecommunications obligations and management practices. To do this, we need your answers to this questionnaire on telecommunications management procedures and practices.

The questions are intended to cover the management of the full range of voice, data, and video services and equipment, **excluding** radio services and equipment. In responding to the questions, please address your organization's management procedures and practices for internet, intranet, and extranet services and equipment as well as wireless services and equipment (e.g., cellular and pager), 800 services, and credit card services. If you are unsure as to whether to address the management procedures and practices for any of the telecommunications services your organization uses, please contact us.

The purpose of this questionnaire is to obtain information about:

- your organization;
- high-level planning, acquisition, and implementation of telecommunications equipment and services;
- planning, acquiring, and implementing important telecommunications projects, equipment, and services;
- delivering and supporting telecommunications equipment and services;
- monitoring telecommunications equipment and services;
- using GSA's FTS 2001 or GSA's Metropolitan Area Acquisition contracts; and
- major emerging telecommunications issues over the next 5 years.

This questionnaire is directed to the offices, divisions, groups or other entities within your organization or external to it that are accountable for telecommunications services and equipment for your organization.

We request that your organization's Chief Information Officer (or the senior management official that is accountable for your organization's telecommunications services) review and agree with the information provided.

Please be aware that if your organization is selected for a follow-up review, you will be asked for copies of documents supporting your responses to this questionnaire.

The time to complete this questionnaire depends on the availability of information. If the information is readily available, we estimate it will take about 2 hours.

See pages 22 – 27 for a “**Glossary of Terms**” which defines many of the terms used in the questionnaire. Please refer to it as you answer the questions.

If you have questions concerning any part of this questionnaire, please contact David Solenberger at (913) 384-7565 or George L. Jones at (913) 384-7443, or at the e-mail addresses below.

In typing responses directly into the Word 97 questionnaire document, please use “TYPEOVER” mode, rather than “insert” mode.

We would appreciate receiving the completed questionnaire back via e-mail in Microsoft Word 97 format **by July 7, 2000**. If you have problems responding via e-mail, please forward the completed questionnaire on a diskette or hard copy by July 7, 2000. If you e-mail it, send it to [solenbergerd.kcro@gao.gov](mailto:solenbergerd.kcro@gao.gov) or [jonesg.kcro@gao.gov](mailto:jonesg.kcro@gao.gov). If you mail a diskette or hardcopy, send it to the following address:

U.S. General Accounting Office  
Attn: David Solenberger or George L. Jones  
5799 Broadmoor, Suite 600  
Mission, Kansas 66202-2482

Thank you for your assistance.

When you see the term “**your organization**” throughout this questionnaire, please replace it with the name of the federal agency or bureau for which the responses apply (e.g. Internal Revenue Service, Federal Bureau of Investigation, Farm Service Agency, U.S. Army, U.S. Air Force, U.S. Navy, U.S. Customs Service, etc. If you have any questions on this, please contact one of the people listed on the first page of this questionnaire.

**Part I. General Information**

1. What is the name of the federal agency or bureau (your organization) for which your responses to this questionnaire apply? *(Please fill in below.)*

United States Nuclear Regulatory Commission

2. Please provide the name, telephone number, and e-mail address of the individual whom we should contact if we need to clarify any of your organization’s responses to the questionnaire. *(Please fill in below.)*

Stuart Reiter, Acting Chief Information Officer, 301-415-8700, STR@nrc.gov

3. Which of the following categories of telecommunications services does your organization (answer to question 1) use? *(Please check all that apply.)*

- a. Wide area networks
- b. Metropolitan area networks
- c. Local area networks
- d. Long distance voice services / equipment
- e. International voice services / equipment
- f. Local voice services / equipment
- g. Video services / equipment
- h. Other (Please specify.) \_\_\_\_\_
- i. No basis to judge or not applicable (Please explain.) \_\_\_\_\_

4. For each of the categories of telecommunications services that your organization uses (answer to question 3), please identify the names of the entities within your organization or external to it that are accountable for the services. These entities may be offices, divisions, or other groups within your organization or external entities such as contractors, federal departments, bureaus, agencies, or other entities. **Completion of this questionnaire may require input from some or all of these entities.** *(Fill in the name of the entity in the first column and then check each of the categories of service for which that entity is accountable.)*

Names of entities accountable for your organization’s telecommunications services	Categories of telecommunications service							
	Wide area networks	Metropolitan area networks	Local area networks	Long distance voice services	Internat. voice services	Local voice services	Video services	Other (specify): Voice / LAN Cabling
Office of the Chief Information Officer, Information Technology Infrastructure Division	X	X	X	X	X	X (WMA)	X (WMA)	X (WMA)
Regional Offices						X		X
IRO	X	X	X	X	X	X	X	X

5. Does any entity within your organization or external to your organization (contractors or other entities) operate one or more private networks to provide any of your organization's voice, data, or video services? *(Please check only one.)*
- ❖ a. Yes
  - b. No
  - c. No basis to judge or not applicable (Please explain.) \_\_\_\_\_
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6. If your organization uses private networks, in the last 3 years, has an evaluation been performed to determine if private networks are the most cost-effective source for your organization's telecommunications services? *(Please check only one.)*
- a. Yes
  - ❖ b. No
  - c. No basis to judge or not applicable (Please explain.) \_\_\_\_\_
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*NOTE: More than three years ago a plan was put in place to migrate the data network from private lines to ATM and frame relay services. The migration has been completed in the last three years. The T1 circuits that were part of this private network are now being used for video teleconferencing services. The video teleconferencing services are under review to determine future capacity requirements. Once the capacity needs are known, an evaluation will be conducted to determine if the current architecture, including the private T1 network, is the most cost-effective means of providing this service.*

7. In the last 3 years, has your organization or any of the entities within your organization or within your Department consolidated or eliminated any private networks? *(Please check only one.)*
- ❖ a. Yes
  - b. No
  - c. No basis to judge or not applicable (Please explain.) \_\_\_\_\_
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## **Part II. High-Level Planning, Acquisition, and Implementation of Telecommunications Equipment and Services**

8. Does your organization have a strategic telecommunications plan? *(Please check only one.)*
- ❖ a. Yes
  - b. No
  - c. Under development or in draft form
  - d. No basis to judge or not applicable (Please explain.) \_\_\_\_\_
-

9. If your organization has a strategic telecommunications plan, does it define your organization's telecommunications (voice, data, and video) program objectives and provide a description of how your organization intends to use telecommunications services to help accomplish the objectives? *(For each row below, please check only one column.)*

<b>Do you have a strategic plan that includes</b>	<b>Yes</b>	<b>No</b>	<b>Under development or in draft form</b>	<b>No basis to judge or not applicable</b>
Definition of telecommunications program objectives?	X			
Description of how you intend to use telecommunications services to accomplish objectives?	X			

If you checked no basis to judge or not applicable above, please explain:

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10. If your organization has a strategic telecommunications plan, which of the following periods best describes the time period it covers? *(Please check only one.)*

- a. 1 year
- b. 2 years
- c. 3 years
- d. 4 years
- e. 5 years
- f. More than 5 years
- g. Other (Please specify.) \_\_\_\_\_
- h. No basis to judge or not applicable (Please explain.) \_\_\_\_\_

11. If your organization has a strategic telecommunications plan, when was your strategic telecommunications plan last updated? *(Please check only one.)*

- a. Within the last year
- b. More than 1 year to within the last 3 years
- c. More than 3 years ago
- d. No basis to judge or not applicable (Please explain.) \_\_\_\_\_

12. For the following entities, does your organization have **performance data** that are regularly reported to senior managers? Does your organization have performance **goals** defining how much it expects to improve for each entity? Does your organization use these measures to determine the **impact of telecommunications services on mission performance** (productivity, efficiency, and effectiveness)? (For each row below, please check only one column for “Reported Measures Data,” only one column for “Performance Goals,” and only one column for “Impact on Mission Performance.” NA means not applicable and NB means no basis to judge.)

Entities	Reported Measures Data			Performance goals			Impact on mission performance		
	Yes	No	NA NB	Yes	No	NA NB	Yes	No	NA NB
Entity or entities within your organization (offices, divisions, groups, etc.) that are accountable for your organization’s telecommunications services, networks, etc	X			X			X		
Entity or entities external to your organization (providers, other contractors, federal departments, bureaus, agencies, or other entities) that are accountable for your organization’s telecommunications services, networks, etc		X			X			X	

For each “yes” answer above, please use the space below to provide examples of the reported performance measures data and goals, and a brief explanation of how the performance data are used to determine the impact of telecommunications services on mission performance. (If you need more space, please attach sheets at the end of the survey.)

1. NRC has an established reporting system of performance measures for critical components of the agency infrastructure. This includes telecommunications, LAN/WAN, internet access, email, remote access, customer service responsiveness, as well as critical agency applications.

- a. These measures are reported weekly to senior management and are managed and monitored. In addition, the measures are made available agency wide through our intranet on the customer service homepage.
- b. The performance measures have goals and thresholds set as guidelines for measuring performance. These are analyzed as part of ongoing trend analysis to be proactive rather than reactive in managing and projecting the agency’s IT infrastructure requirements.

2. NRC measures and reports the operating costs for video conferencing services, and the hours and locations of the use of these services. The agency collects information on the potential cost of the travel that was avoided each month as a result of the use of these services. This is reported monthly and used to validate the return on the investment in video conferencing systems by the agency.

3. NRC tracks and reports the percent utilization of video conferencing systems each month. This is measured in order to anticipate the need for more system capacity. The agency hopes to respond with system upgrades in time to avoid future additional travel costs.

NRC externally contracts for nearly all of its telecommunications services through Inter-Agency Agreements (IAA's) with the General Services Administration. There are no service measurements or goals agreed to through these IAA's, although there are service goals imposed by GSA on their contractors.

4. NRC has performance plan goals associated with the Emergency Telecommunications System (ETS) and metrics associated with ETS availability data.

For each “no” or “not applicable” or “no basis to judge” answer above, please explain: *(If you need more space, please attach sheets at the end of the survey.)*

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13. Does your organization have a telecommunications architecture defining the structure of your organization’s **existing** telecommunications networks? *(Please check only one.)*

- a. Yes
- b. No
- c. Under development or in a draft form
- d. No basis to judge or not applicable (Please explain.) \_\_\_\_\_

NOTE: NRC’s Telecommunications systems architecture is described in the NRC IT Architecture document.

14. If your organization has a telecommunications architecture for your existing networks, does it include your networks’ physical configuration, functional organization, and operational procedures? *(For each row below, please check only one column.)*

Do you have a telecommunications architecture that includes your existing networks’	Yes	No	Under development or in draft form	No basis to judge or not applicable
Physical configuration?	X			
Functional organization?	X			
Operational procedures?	X			

If you checked no basis to judge or not applicable above, please explain:

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15. If your organization has a telecommunications architecture, does it have formal procedures for managing how changes are made to that telecommunications architecture? *(Please check only one.)*

- a. Yes NOTE: Consideration of the impact and cost of change is part of the CPIC process for all major IT programs, including telecommunications architecture changes.
- b. No
- c. Under development or in draft form

d. No basis to judge or not applicable (Please explain.) \_\_\_\_\_

16. Has your organization defined its long-range (future) telecommunications architecture and prepared a transition plan to guide the transition or evolution to that architecture? (For each row below, please check only one column.)

Has your organization:	Yes	No	Under development or in draft form	No basis to judge or not applicable
Defined its long-range telecommunications architecture?	X			
Prepared a transition plan to guide evolution to the long-range architecture?	X			

If you checked no basis to judge or not applicable, please explain: \_\_\_\_\_

17. If your organization defined its long-range telecommunications architecture, which of the following periods best describes your organization's definition of long-range? (Please check only one.)

- a. Under 2 years
- b. 3 years
- c. 4 years
- ❖ d. 5 years
- e. More than 5 years
- f. Other (Please specify.) \_\_\_\_\_
- g. No basis to judge or not applicable (Please explain.) \_\_\_\_\_

18. Does your organization have a short-term telecommunications plan? (Please check only one.)

- ❖ a. Yes *NOTE: Plans are provided as part of the annual IT Planning Call.*
- b. No
- c. Under development or in draft form
- d. No basis to judge or not applicable (Please explain) \_\_\_\_\_

19. If your organization has a short-term telecommunications plan, does it contain short-term goals for telecommunications services and provide a description of the actions, projects, or initiatives for accomplishing the goals? (For each row below, please check only one column.)

Does your organization have a short-term telecommunications plan that contains:	Yes	No	Under development or in draft form	No basis to judge or not applicable
Short-term goals?	X			
Description of actions, projects, or initiatives for accomplishing the goals?	X			

If you checked no basis to judge or not applicable above, please explain:

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20. If your organization has a short-term telecommunications plan, which of the following periods best describes your organization's definition of short-term? *(Please check only one.)*

- a. 1 month
- b. 1 quarter
- c. 6 months
- d. 1 year
- e. 2 years
- f. Other (Please specify.) \_\_\_\_\_
- g. No basis to judge or not applicable (Please explain.) \_\_\_\_\_

21. Has your organization established a management structure that makes your Chief Information Officer or other single senior manager accountable for **all** your organization's voice, data, and video services? *(Please check only one.)*

- a. Yes, a Chief Information Officer *NOTE: The NRC CIO is accountable for all voice, data, and video services in the agency. The OCIO has direct management and financial control over most of these services, with the exception of those required for (nuclear) Incident Response Operations, which have remained under the EDO. There are also some functions for local voice services at the Regional offices that have been left under local control, with guidance from OCIO, to provide more effective and efficient operations and cost accounting.*
- b. Yes, a single senior manager, but not a Chief Information Officer
- c. No (Please explain.) \_
- d. No basis to judge or not applicable (Please explain.)

22. For which of the following telecommunications functions, if any, is your organization's Chief Information Officer or another single senior manager, accountable for each of the specified telecommunications services? *(For each row below, please write in a "C" in each column for which your Chief Information Officer is accountable for the function for that category of service; and an "S" in each column for which a single senior manager who is not your CIO, is accountable for the function for that category of service. Fill in all columns that apply. NA means not applicable and NB means no basis to judge.)*

Telecommunications functions	Categories of telecommunications service								
	Wide area networks	Metropolitan area networks	Local area networks	Long distance voice services	Internat. Voice services	Local voice services	Video services	None of these Services	NA or NB
Strategic planning for telecommunications	C/S	C/S	C/S	C/S	C/S	C/S	C/S		
Telecommunications short-term planning	C/S	C/S	C/S	C/S	C/S	C/S	C/S		
Implementing telecommunications performance measures	C/S	C/S	C/S	C/S	C/S	C/S	C/S		

Implementing capital planning and investment processes for telecommunications	C/S								
Acquiring and implementing important telecommunications projects, equipment, and services	C/S								
Delivering telecommunications services to users	C/S								
Ensuring network security	C/S								
Monitoring telecommunications services	C/S								

If no basis to judge or not applicable, please explain: \_\_\_\_\_

23. Has your organization determined the knowledge and skill requirements in telecommunications technology/management needed to achieve your organization's goals? *(Please check only one.)*

- a. Yes *NOTE: NRC has done a skills assessment agencywide to ensure that agency personnel are able to take advantage of available IT services.*
- b. No
- c. No basis to judge or not applicable (Please explain.) \_\_\_\_\_

24. Has your organization assessed the degree to which your existing telecommunications staff meets your organization's staff knowledge and skill requirements in telecommunications technology/management? *(Please check only one.)*

- a. Yes
- b. No
- c. No basis to judge or not applicable (Please explain.) \_\_\_\_\_

25. Has your organization developed written plans that identify how it will address deficiencies, if any, in the knowledge and skill of your existing staff in telecommunications technology/management? *(Please check only one.)*

- a. Yes
- b. No
- c. Under development or in draft form
- d. No basis to judge or not applicable (Please explain.) See response to #23.

26. Has your organization reported (to the head of your organization) on progress in overcoming deficiencies, if any, in the knowledge and skill of your existing staff in telecommunications technology/management? (Please check only one.)

- a. Yes
  - b. No
  - c. No basis to judge or not applicable (Please explain.) See response to #23.
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27. Since October 1, 1997, which of the following analyses/studies, if any, has your organization done or a contractor or other entity done for you? (Please check all that apply.)

- a. An analysis of available and emerging telecommunications technology and trends to determine how your organization can use telecommunications services to accomplish its strategic goals.
- b. A study of how other public and private organizations acquire, manage, or use telecommunications services.
- c. A traffic/workload study of your organization's current levels of use of telecommunications services.
- d. An evaluation of your organization's stakeholder/user expectations for telecommunications services.
- e. An evaluation of your organization's wide area networks or circuits, lines, etc., to identify integration or consolidation opportunities, or services that are not needed (e.g., network design optimization studies).
- f. An analysis of your organization's telecommunications services bills to identify waste/inefficiencies, overcharges, or charges for lines or services no longer used.
- g. An evaluation of your organization's telecommunications services contracts to identify opportunities to take advantage of varying rate structures and volume discounts.
- h. An evaluation of the pros and cons of integrating voice, data, and video services/networks.
- i. An analysis of telecommunications outsourcing options to determine whether your organization should outsource some or all of your telecommunications management, operations, support, etc. These studies may have been done to reply to legislation or OMB Circular A-76 requirements.
- j. A forecast of your organization's needs/use levels for telecommunications services.
- k. No basis to judge or not applicable (Please explain.) \_\_\_\_\_

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**Part III. Planning, Acquiring, and Implementing Important Telecommunications Projects, Equipment, and Services**

28. Please identify your organization's seven (or fewer if you do not have seven projects) most important ongoing or planned telecommunications projects or investments (e.g., wide area networks, metropolitan area networks, major new services, or support contracts, etc.). If readily available, provide the actual obligations for each of the projects for fiscal year 1999, the estimated obligations for fiscal year 2000, and the estimated/projected obligations for fiscal year 2001. (This list of critical telecommunications projects may or may not be the same list of mission-critical systems for Year 2000 purposes. Your list should include all major projects you submitted to OMB plus any other projects you consider important.) *(For each project or investment identified below, please place a check mark in either the Ongoing or Planned column. Then enter the appropriate actual, estimated, or estimated/projected obligations amounts in the other columns, if available.)*

Project/investment	Ongoing	Planned	FY 1999 Actual Obligations	FY 2000 Estimated Obligations	FY 2001 Estimated / Projected Obligations
OCIO - Information Technology Infrastructure Telecommunications Services and Support (Planned Accomplishment 3)	X		\$ 8.1 M	\$ 7.2 M	\$ 6.9 M

29. Does your organization use a formal information technology capital planning and investment process to select which major telecommunications projects to fund (e.g., wide area networks, metropolitan area networks, major new services or support contracts, etc.)? *(Please check only one.)*

- a. Yes
- b. No (Please explain.) \_\_\_\_\_
- c. No basis to judge or not applicable (Please explain.) \_\_\_\_\_

30. If your organization uses a formal information technology capital planning and investment process to select which major telecommunications projects to fund, to what extent, if any, did your organization use that process in making the decisions to invest in the projects you identified in your response to question 28 (your most important projects)? *(Please check only one.)*

- ❖ a. All projects
- b. Most of the projects
- c. About half of the projects
- d. Some of the projects
- e. None of the projects (Please Explain.) \_\_\_\_\_
- f. No basis to judge or not applicable (Please explain.) \_\_\_\_\_

31. For each of the telecommunications projects/investments you identified in your response to question 28, please identify the documentation (analyses, studies, plans, etc.) that your organization actually prepared. (For each column, please check all the row items that apply. A check mark will indicate “Yes”. You already named the projects in question 28. Column labeled “Q.28.Proj.1” refers to the first project you listed in question 28, column “Q.28.Proj.2 refers to the second one, etc.)

Documentation :	Q.28. Proj.1	Q.28. Proj.2	Q.28. Proj.3	Q.28. Proj.4	Q.28. Proj.5	Q.28. Proj.6	Q.28. Proj.7
Stakeholder/user requirements study	X						
Feasibility study							
Cost-benefits analysis							
Alternatives analysis							
Design document							
Training plan							
Business processes analysis							
Performance measures	X						
Performance goals	X						
Baseline performance data	X						
Project plan							
Risk analysis/mitigation plan							
Test plan							
Validation plan							
Implementation/integration plan							
Post implementation review plan							

32. To what extent, if any, do your organization’s long-term leases for telecommunications services (other than the FTS 2001 contracts or the FTS2000 extension contracts) include renegotiation clauses that allow you to renegotiate costs during the period of the contract? (Please check only one.)

- a. All include renegotiation clauses
- b. Most include renegotiation clauses
- c. About half include renegotiation clauses
- d. Some include renegotiation clauses
- e. None include renegotiation clauses
- ❖ f. No basis to judge or not applicable (Please explain.) Not applicable. No long-term leases. \_\_\_\_\_

33. If your organization has renegotiation clauses in its long-term contracts for telecommunications services, which of the following periods best describes the last time your organization renegotiated the cost of a long-term telecommunications contract? *(Please check only one.)*

- a. Under 1 year ago
- b. About 1 year ago
- c. About 2 years ago
- d. About 3 years ago
- e. About 4 years ago
- f. More than 4 years ago
- g. Other (Please specify.) \_\_\_\_\_
- ❖ h. No basis to judge or not applicable (Please explain.) *Not applicable. No long-term leases.* \_\_\_\_\_

34. Does your organization have concept of operations documents or other such documentation defining the day-to-day operation of your organization's existing networks? *(Please check only one.)*

- ❖ a. Yes
- b. No
- c. Under development or in draft form
- d. No basis to judge or not applicable (Please explain.) \_\_\_\_\_

35. If your organization has concept of operations documents or other such documentation defining the day-to-day operation of your networks, do these documents define the roles, responsibilities, and procedures for operation and maintenance of your networks? *(For each row below, please check only one column.)*

Does your organization have concept of operations documents that define the roles, responsibilities, and procedures for:	Yes	No	Under development or in draft form	No basis to judge or not applicable
Operation of networks?	X			
Maintenance of networks?	X			

If you checked no basis to judge or not applicable above, please explain:

\_\_\_\_\_

\_\_\_\_\_

**Part IV. Delivering and Supporting of Telecommunications Equipment and Services**

36. Does your organization have formal service-level agreements between the entities within your organization or external to it that are accountable for the telecommunications services your organization uses and: (1) each user group in your organization, (2) each external telecommunications provider, (3) each other telecommunications contractor (not provider), (4) each federal agency or other entity that provides telecommunications services to your organization? *(For each row below, please check only one column.)*

Does your organization have formal service-level agreements between the entities that are accountable for telecommunications services your organization uses and:	Yes	No	Under development or in draft form	No basis to judge or not applicable
Each user group in your organization?	X			
Each external telecommunications provider?		X		
Each other telecommunications contractor (not provider)?			X	
Each federal agency or other entity that provides telecommunications services to your organization?		X		

If you checked no basis to judge or not applicable above, please explain:

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37. Which of the following telecommunications areas, if any, are covered by procedures from your organization's overall network performance management program? (Overall procedures may be tailored for management of each network, as appropriate.) *(Please check all that apply.)*

- ❖ a. Assessments of bandwidth used or needed
- ❖ b. Monitoring of traffic volume or frequency
- c. Use of network modeling tools
- ❖ d. Use of network monitoring tools and procedures
- e. Use of network tuning tools and procedures
- ❖ f. Use of network reporting tools and procedures
- g. Not applicable, do not have such a program
- h. No basis to judge (Please explain.) \_\_\_\_\_

38. Does your organization have contingency or continuity of operations plans that address telecommunications services? *(Please check only one.)*

- ❖ a. Yes *NOTE: NRC has developed an emergency telecommunications system to provide essential services during an emergency at headquarters or the regional offices.*
- b. No
- c. Under development or in draft form.
- d. No basis to judge or not applicable (Please explain.) \_\_\_\_\_

39. Which of the following security areas, if any, are covered by procedures from your organization's overall network security management program? (Overall procedures may be tailored for management of each network, as appropriate.) *(Please check all that apply.)*

- ❖ a. Logical network access controls to systems, data, or programs
  - ❖ b. Physical access controls to telecommunications facilities, equipment, or wiring closets
  - ❖ c. Virus prevention tools
  - ❖ d. Virus detection tools
  - ❖ e. Firewalls
  - ❖ f. Security logs
  - g. Encryption
  - h. Digital signature process
  - i. Proof of origin of messages process
  - j. Delivery of messages process
  - ❖ k. Incident tracking process
  - l. Other (Please specify.) \_\_\_\_\_
  - m. Not applicable, do not have such a program
  - n. No basis to judge (Please explain.) \_\_\_\_\_
- 

40. Which of the following areas, if any, are covered by procedures from your organization's overall configuration management program? (Overall procedures may be tailored for management of each network, as appropriate.) *(Please check all that apply.)*

- ❖ a. Identifying telecommunications assets and their physical locations
  - b. Establishing a conceptual model of your organization's networks and interfaces
  - c. Allocating network infrastructure resources
  - ❖ d. Physical network component management
  - ❖ e. Network system software distribution or installation
  - f. Not applicable, do not have such a program
  - g. No basis to judge (Please explain.) \_\_\_\_\_
- 

41. Does your organization have an inventory for its telecommunications assets (routers, switches, Private Branch Exchanges, software, etc.)? *(Please check only one.)*

- ❖ a. Yes
  - b. No
  - c. No basis to judge or not applicable (Please explain.) \_\_\_\_\_
- 

42. If your organization has an inventory for its telecommunications assets, does it include all your currently owned and leased telecommunications assets? *(Please check only one for each row.)*

Does your organization have an inventory that includes:	Yes	No	No basis to judge or not applicable
All owned telecommunications assets?	X		
All leased telecommunications assets?	X		

If you checked no basis to judge or not applicable above, please explain:

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43. If your organization has an inventory of its telecommunications assets, when was it last verified as accurate? *(Please check only one.)*

- a. Within the last year
- b. More than 1 year to within the last 3 years
- c. More than 3 years ago
- d. Never
- e. Not applicable, do not have an inventory
- f. No basis to judge (Please explain.) \_\_\_\_\_

44. Which of the following issues, if any, are covered by procedures from your organization's network fault-management program? (Overall procedures may be tailored for management of each network as appropriate.) *(Please check all that apply.)*

- a. Detecting the occurrence of faults
- b. Reporting the occurrence of faults
- c. Recording the faults
- d. Diagnosing faults
- e. Correcting the faults
- f. Not applicable, do not have such a program
- g. No basis to judge (Please explain.) \_\_\_\_\_

NOTE: Critical services, such as the NRC Operations Center, have procedures as noted.

#### Part V. Monitoring Telecommunications Equipment and Services

45. Does your organization have a system/process that provides your Chief Information Officer or senior manager or managers with timely information regarding the progress of major telecommunications projects (in terms of cost, schedule, or performance)? *(Please check only one.)*

- a. Yes
- b. No
- c. Under development
- d. No basis to judge or not applicable (Please explain.) \_\_\_\_\_

46. Has your organization had any baseline breaches (as defined by the Federal Acquisition Streamlining Act – FASA) for any of your major telecommunications projects or investments? *(Please check only one.)*

- a. Yes (Please identify the projects or investments.) \_\_\_\_\_
- 
- ❖ b. No
- c. No basis to judge or not applicable (Please explain.) \_\_\_\_\_
- 

47. If your organization has had baseline breaches (as defined by the Federal Acquisition Streamlining Act – FASA) for any of your major telecommunications projects or investments, have you reported them to the Office of Management and Budget (OMB)? *(Please check only one.)*

- a. Yes (Please identify the projects or investments.) \_\_\_\_\_
- 
- b. No
- c. No basis to judge or not applicable (Please explain.) \_\_\_\_\_
- 

48. Does your organization routinely perform self-assessments (or use a contractor or other entity to perform assessments) of the adequacy of the internal controls over your telecommunications services (data, voice, and video services)? *(Please check only one. If Yes, please enter the month and year the most recent study was completed.)*

- ❖ a. Yes (Please provide the date the most recent study was completed) May 13, 1999
- b. No
- c. No basis to judge or not applicable (Please explain.) Reasonable Assurance Statement for 1999
- 

49. Have any of the following groups performed reviews, assessments, or audits of any aspect of your telecommunications program? *(For each row below, please check only one column. If Yes, please enter the month and year the most recent study was completed.)*

Groups	Yes	If yes, date most recent study was completed	No	No basis to judge or not applicable
Office of Management and Budget			X	
General Accounting Office	X	B282543 on 8-27-99		
Your organization's Inspector General office	X	Continuing		
Contractors <i>(Please specify.)</i>	X	SETA Corporation, FY 1994-present		
Other entities <i>(Please specify.)</i>				

If you checked no basis to judge or not applicable, please explain: \_\_\_\_\_  
SETA Corporation reviewed all Purchase Orders and Contracts in FY 1996 as part of NRC's Telecommunications Consolidation (TCC) program.

50. Has your organization (or a contractor or other entity) quantitatively benchmarked against other organizations (public or private), any part of your organization's telecommunications: (1) costs, (2) performance, or (3) policies, procedures, or practices? *(For each row below, please check Yes, No, or No basis to judge or not applicable. If you checked Yes, please enter the month and year the most recent study was completed.)*

Has your organization (or a contractor or other entity) quantitatively benchmarked your telecommunications:	Yes	If yes, date most recent study was completed	No	No basis to judge or not applicable
Costs?			X	
Performance?			X	
Policies, procedures, or practices?			X	

If you checked no basis to judge or not applicable, please explain: \_\_\_\_\_  
 \_\_\_\_\_

**Part VI. Using GSA's FTS 2001 or Metropolitan Area Acquisition (MAA) Contracts**

51. Has your organization conducted a formal analysis to decide whether to use GSA's FTS 2001 contracts for telecommunications services (or has another entity done a formal analysis on your organization's behalf)? *(Please check only one.)*

- a. Yes
- b. No
- c. Under development
- d. No basis to judge or not applicable (Please explain.) \_\_\_\_\_

52. Does your organization plan to use the FTS 2001 contracts? *(Please check only one.)*

- a. Yes
- b. No (Please explain.) \_\_\_\_\_
- c. Undecided
- d. No basis to judge or not applicable (Please explain.) \_\_\_\_\_

53. If your organization plans to use the FTS 2001 contracts, what is the status of transition to the contracts? *(Please check all that apply.)*

- a. Vendor(s) have been selected
- b. Transition plan(s) have been completed
- c. Transition has been completed
- d. My organization does not plan to use the FTS 2001 contracts
- e. No basis to judge or not applicable (Please explain.) \_\_\_\_\_

54. Has your organization conducted a formal analysis of each of the MAA contracts that GSA has awarded thus far, that applies to your organization, to decide whether to use each of the applicable contracts (or has a contractor or other entity done a formal analysis for your organization)? *(Please check only one.)*

- a. All the MAA applicable contracts awarded thus far have been formally analyzed
  - b. Most, but not all of the applicable MAA contracts awarded thus far have been formally analyzed
  - c. Some of the applicable MAA contracts awarded thus far have been formally analyzed
  - d. None of the applicable MAA contracts awarded thus far have been formally analyzed
  - ❖ e. None of the MAA contracts awarded thus far apply to my organization. (Please explain.) GSA WITS and its follow-on are not called MAA's. MAA's to date are not in NRC's required service areas.
  - f. No basis to judge or not applicable (Please explain.) \_\_\_\_\_
- 

55. Does your organization plan to use any of the MAA contracts that GSA has awarded thus far? *(Please check only one)*

- a. Yes
- ❖ b. No (Please explain.) \_\_\_\_\_ See response to Question #54.
- c. Undecided
- d. No basis to judge or not applicable (Please explain.) \_\_\_\_\_

**Part VII. Identifying Major Emerging Telecommunications Issues**

56. To what extent, if at all, will the following issues be significant telecommunications challenges for your organization over the next 5 years? Please add and rate any other issue you consider significant which we failed to list. (For each row below, please check only one column.)

Issues	Degree of significance					
	None	Little	Some	Moderate	Great	Very Great
Deciding whether to outsource some or all of your organization's telecommunications services management, operations, support, etc.			X			
Integrating or consolidating your organization's networks, circuits, lines, etc.			X			
Safeguarding information that flows across networks against unauthorized use, disclosure, modification, damage, or loss.				X		
Using telecommunications services to improve service to customers, stakeholders, citizens				X		
Sharing networks within your organization or with other organizations (departments, agencies, bureaus, offices, etc.)				X		
Establishing performance measures that quantitatively measure telecommunications services contribution to mission productivity, efficiency, or effectiveness				X		
Implementing a cost accounting system or process to accumulate and report the full cost of your organization's telecommunications equipment and services			X			
Establishing a management structure that centralizes the responsibility/accountability for planning and managing all of your organization's voice, data, and video services			X			
Hiring and retaining skilled telecommunications professionals			X			
Acquiring skilled contractor support			X			
Implementing IT capital planning and investment processes that include telecommunications services investments, across agencies/bureaus			X			
Establishing a departmentwide (or agencywide, or bureauwide) telecommunications architecture			X			
Implementing electronic commerce			X			
Assessing the competence of your organization's telecommunications professionals			X			
Other (Please specify.)						
Other (Please specify.)						
Other (Please specify.)						
Other (Please specify.)						
Other (Please specify.)						

## Part VIII. Additional Comments (Optional)

If you wish to provide specific details to support any of your answers or if you have comments on any of the items covered or not covered by the questionnaire, please include the information or comments in the space below. You may attach additional pages if needed. **Thank you very much for your answers.**

### NOTES ON QUESTION #56.

- Deciding whether to outsource ... *This has some significance as we continue to look for further opportunities to outsource more telecommunications services.*
- Integrating or consolidating ... *This has some significance as we continue to look for new technologies that will allow us to consolidated our networks even further.*
- Safeguarding information ... *This has moderate significance, primarily in the area of virus protection and protection of critical agency infrastructure.*
- ... improve service to customers stakeholders,citizens ... *Improving service to customers is of moderate significance, and must be balanced with providing for the public safety, providing adequate public access, and keeping the telecommunications costs to a minimum.*
- Sharing networks ... *This has moderate significance as the agency continues to establish and maintain the network connections to other agencies and national labs.*
- Establishing performance meas... *This has moderate significance for the future. Although the agency currently measures telecommunications availability, it is a challenge to measure in a quantitative way the benefits of using versus not using these services and to identify the improved efficiency and effectiveness they provide. Our first such quantitative performance measure that demonstrated improved efficiency as a result of telecommunications services was the savings in travel costs recorded by the users of the agency's videoconferencing services.*
- Implementing a cost accounting ... *This has some significance as services change and we continue to determine the full cost of our telecommunications services.*
- Establishing a management struc... *This has some significance as we strive to remain centralized in the oversight of our telecommunications services.*
- Hiring and retaining skilled telecommunications professionals. *This has some significance. It is becoming more difficult to find skilled telecommunications professionals. We have lost some staff due to retirement in recent years.*
- Acquiring skilled contractor ... *This has some significance. Our outsourcing vendors have provided skilled and qualified personnel thus far, but we are aware of the shortages in the marketplace.*
- Implementing IT capital planning and investment processes ... *This has some significance as we continue to enforce our CPIC process in the agency.*
- Establishing ... architecture ... *This has some significance as technological advances may force a shift in the agencywide architecture.*
- Implementing electronic commerce. *This is a new initiative at the agency. It has some significance as we expand our use of this technical capability. It may have some affect on the cost and type of telecommunications services.*
- Assessing the competence of your organization's telecomm ... *This has some significance. The competence of our staff with new and emerging technologies can be maintained and improved by appropriate training opportunities.*

## Part IX. Glossary of Terms

**Accountable** – responsible; answerable; obligated to report, explain, or justify an action, expenditure, investment, project, etc.

**Accuracy** – The degree of conformity of a measured or calculated value to its actual or specified value.

**Alternatives analysis** – An analysis to compare and evaluate the costs and benefits of various alternatives for meeting a requirement for the purpose of selecting the alternative that is most advantageous to the enterprise.

**Bandwidth** – In network communications, the amount of data that can be sent across a wire in a given time. Each communication that passes along the wire decreases the amount of available bandwidth.

**Baseline performance data** – Performance data on the current processes that provide the metrics against which to compare improvements and to use in benchmarking.

**Benchmark** – A comparison technique. Per the Clinger Cohen Act, the head of an executive agency shall, where comparable processes and organizations in the public or private sectors exist, quantitatively benchmark agency process performance against such processes in terms of cost, speed, productivity, and quality of outputs and outcomes.

**Best practices** – Processes, practices, or systems used by public and private organizations that perform exceptionally well and are widely recognized as improving an organization's performance and efficiency in specific areas. Successfully identifying and applying best practices can reduce business expenses and improve an organization's efficiency.

**Bridge** – A network interconnectivity device that selectively determines the appropriate segment to which it should pass a signal. Through address filtering, bridges can divide busy networks into segments and reduce network traffic.

**Business process** - A collection of related, structured activities—a chain of events—that produce a specific service or product for a particular customer or customers.

**Business processes analysis** – An evaluation of the business processes supported by, or associated with, an information system, telecommunications project, or information technology initiative to determine which processes should be improved, which should be reengineered, and which should not be changed. Such an analysis may involve using performance measures to benchmark existing processes against similar processes in other organizations or against performance goals.

**Circuit** – A communications channel established between two networks. The physical connection (or path) of channels, conductors, and equipment between two given points through which an electric current may be established. Includes both sending and receiving capabilities. A circuit can also be a network of circuit elements, such as resistors, inductors, capacitors, semi-conductors, etc. that performs a specific function. A circuit can also be a closed path through which current can flow.

**Concept of operations** – As it relates to telecommunications services, a concept of operations document defines the roles, responsibilities, and procedures for day-to-day operation and maintenance of networks and other telecommunications services.

**Configuration management** – One of five categories of network management defined by the International Standards Organization. As it relates to telecommunications services, configuration management is the process of adding, deleting, and modifying connections, addresses, and topologies within a network.

**Contingency or continuity of operations plan (COOP)** – An overall plan, including a risk mitigation strategy, contingencies, and recovery procedures, to ensure the organization's core business processes continue in spite of disruptions to infrastructure and/or support systems. The plan describes the steps the enterprise would take including activation of manual or contract processes to ensure the continuity of its core business processes in the event of a telecommunications system failure.

**Cost accounting system or process** – A continuous and systematic accounting process, which is designed to accumulate and assign costs to a variety of objects routinely or as desired by the management. Costs may be accumulated either through the use of cost accounting systems or through the use of cost finding techniques.

**Cost benefit analysis** – A technique used to compare the various costs associated with an investment or project with the benefits it proposes to return. It should address and account for both tangible and intangible factors.

**Design document** – For communications systems, desired performance characteristics for communications circuits and equipment that is based on engineering analyses, but (1) is not considered feasible to mandate in a standard, or (b) has not been tested.

**Effectiveness** – An assessment of the qualitative level of achievement of program goals and the intended results, as defined in strategic or other plans or documentation or in legislation.

**Efficiency** – A measure of the relative amount of resources used in performing a given unit of work. Sometimes characterized as doing things right. Can involve unit costing, work measurement (standard time for a task), labor productivity (ratio of outputs to labor inputs), or cycle time.

**Encryption** – The process of translating a message from the native form of the sender to a transmittable standard form--encoding the message--for security reasons. Also called ciphering.

**Extranet** – An extranet is an Internet-like network that an enterprise runs to conduct business with its employees, its customers, and/or its suppliers. Extranets typically include Web sites that provide information to internal employees and also have secure areas to provide information to customers and external partners like suppliers, manufacturers, and distributors.

**Fault management** –one of five categories of network management defined by the International Standards Organization. As it relates to telecommunications services, fault management is a set of procedures and practices for detecting, isolating, and correcting network faults. A fault is a hard failure or performance degradation so serious as to destroy the ability of a network element to function effectively. Open circuits, short circuits, and breaks are examples of common cable faults.

**Feasibility study** – a study to determine the likelihood, probability, and possibility that an action, investment, or project will generate desirable results.

**Firewall** – hardware and/or software that limit the exposure of a computer or group of computers to an attack from outside. The most common use of a firewall is on a local area network (LAN) connected to the Internet. Without a firewall, anyone on the Internet could theoretically jump onto the corporate LAN and pick up any information on or dump anything to any of the computers on the LAN. A firewall is a system or combination of systems that enforces a boundary between two or more networks. There are several types of firewalls—packet filter, circuit gateway, application gateway, or trusted gateway. The primary purpose of an Internet firewall is to provide a single point of entry where a defense can be implemented, allowing access to resources on the Internet from within the organization, and providing controlled access from the Internet to hosts inside the

organization's internal networks. The firewall must provide a method for a security or system administrator to configure access control lists to establish the rules for access according to local security policies. All access should be logged to ensure adequate information for detailed security audit.

**Implementation/integration plan** – also called a Systems Integration Plan; a document discussing the steps for progressively linking and testing of system or network components to merge their functional and technical characteristics into a comprehensive, interoperable system or network.

**Internet protocol (service)** – Part of the Transmission Control Protocol/Internet Protocol (TCP/IP) family of protocols describing software that track the Internet address of nodes, routes outgoing messages, and recognizes incoming messages. Internet Protocol is used in gateways to connect networks at Open Systems Interconnection (OSI) network Level 3 and above. TCP/IP is a networking protocol that provides communication across interconnected networks, between computers with diverse hardware architectures, and various operating systems. Internet Protocol is the messenger protocol of TCP/IP. The Internet Protocol basically addresses and sends packets. The Internet Protocol address identifies your system on the TCP/IP network. Internet Protocol addresses are 32-bit addresses that are globally unique on a network. They are generally represented in dotted decimal notation, which separates the four bytes of the address with periods.

**Local area network** – A short distance data communications network which is typically within a building or campus and links computers and peripheral devices such as printers, CD-ROMS, and modems using some form of standard control. Local area networks (LAN) allow users to be given access to databases and programs running on client servers and allow users to work jointly and send messages.

**Manage or Management** – to be in charge; to handle, direct, govern, or control something.

**Metropolitan area network** – A data network covering an area larger than a LAN but less than a wide area network (WAN). A metropolitan area network (MAN) typically interconnects two or more LANs. MANs may operate at a higher speed than LANs, may cross administrative boundaries, and may use multiple access methods.

**Metropolitan area acquisition (MAA) contracts** – Contracts awarded by the General Services Administration (GSA) to acquire telecommunications services within a specified metropolitan area. High prices and low competition typically characterize local telecommunications service. The passage of the Telecommunications Act of 1996 removed some of the legal and regulatory obstacles to competition in the local exchange markets. GSA is taking the lead to actively participate in the competitive markets by awarding metropolitan area acquisition contracts to lower the prices for customers through aggregation of requirements and open competition. The approach was tested in New York, Chicago, and San Francisco, where the first large competitive procurements of local exchange services, including advanced digital and networking services occurred.

**Mitigation plan** – A plan describing the action(s) planned or taken to eliminate or reduce the impact or likelihood of a risk/threat prior to an anticipated failure.

**Network Management** – A set of procedures and practices to keep a network operating near maximum efficiency. The International Standards Organization defines network management as encompassing five areas: configuration management, fault management, security management, performance management, and accounting management.

**Network performance management program** – A plan to measure and record resource utilization. Performance management is one of five categories of network management defined by the International Standards Organization.

**Network security management program** – See security management.

**Obligation** – a binding agreement that will result in outlays, immediately or in the future.

**Organization-wide network** – An enterprise-wide or corporate network or a network of networks. Such a network connects most or all of an organization's voice, data, and video resources and may use various methods, including the phone system, LANs, private data networks, leased telecommunications lines, and public data networks. Organization-wide networks come in many shapes and sizes and may span great distances. Connections between networks are made with bridges and routers.

**Outsourcing** – The process by which a company arranges for a contractor or other external entity to manage a specific department or provide a specific function or service for the organization—an organization may contract one of its internal functions out to an outside company. Those functions might include managing the company's networks and or maintaining them. An enterprise might be motivated to do this because they lack the internal resources (typically people with needed knowledge, skills, and experience) or believe they can obtain more economical, effective, or efficient telecommunications services by using a contractor or other external entity.

**Performance goals** – A desired endpoint or purpose of an operation or activity.

**Performance management** –one of the five categories of network management defined by the International Standards Organization. As it relates to telecommunications services a set of procedures and practices for measuring and recording resource utilization.

**Performance measures/performance measurement** – The process of developing measurable indicators that can be systematically tracked to assess progress made in achieving predetermined performance goals and to benchmark an organization's performance against that of other organizations.

**Post implementation review** – An review of an investment or project that compares the actual cost, schedule, performance, and other results achieved after an investment or project has been completed and is fully operational against the conditions that existed prior to the implementation of the investment or project, as indicated by baseline cost, schedule, and performance data, and against the planned cost, schedule, and performance goals established for the investment or project. A post implementation review can provide valuable "lessons learned" that can be applied to future investments or projects.

**Private Branch Exchange** – a private telephone switching system usually located on a customer's premises with an attendant console.

**Private network** – A network (MAN, WAN, or set of interconnected MANs, WANS, or LANs) used by an organization or other end-user such as a department, agency, bureau, division, etc. A private network might use dedicated circuits and private lines leased from public carriers bypassing the switches or they may use microwave technology.

**Project plan** – A schedule, set of steps, scheme, program, or other method for doing a project and accomplishing the project's goals.

**Proof of origin** – An information assurance term whereby the data's recipient is provided with verification as to who sent the information.

**Risk analysis** – A technique to identify and assess factors that may jeopardize the success of a project or achievement of a goal. This technique helps define preventive measures to reduce the probability of these factors from occurring and identify countermeasures to successfully deal with these constraints when they develop.

**Router** – An intelligent internetwork connectivity device that uses logical and physical addressing to connect two or more logically separate networks. Routers use algorithms to determine the best path by which to send a packet.

**Security management** – One of the categories of network management defined by the International Standards Organization. Security management is a set of procedures and practices that may use various tools to restrict access to various resources in the network.

**Service level agreement** – An agreement defining the nature of the service to be provided and establishing a set of metrics/measurements to be used to measure the level of service provided against the agreed level of service. Service level agreements may be completed between the entities within an organization or external to it that are accountable for the telecommunications services the organization uses and: (1) each user group in the organization, (2) each external telecommunications provider, (3) each other telecommunications contractor (not provider), (4) each federal agency or other entity that provides telecommunications services to the organization.

**Software** – The detailed instructions to operate a computer or other type of equipment or hardware. The term was created to differentiate instructions (i.e., the program) from the hardware.

**Stakeholder** – An individual or group with an interest in the success of an organization in delivering intended results and maintaining the viability of the organization's products and services. Stakeholders influence programs, products, and services. Examples include congressional members and staff of relevant appropriations, authorizing, and oversight committees; representatives of central management and oversight entities such as OMB and GAO; and representatives of key interest groups, including those groups that represent the organization's customers and interested members of the public.

**Telecommunications** – For purposes of this questionnaire, telecommunications is the full range of voice, data, and video services and equipment, including internet, intranet, and extranet services and equipment as well as wireless services and equipment (e.g., cellular and pager), 800 services, and credit card services, **excluding** radio services and equipment.

**Telecommunications architecture** – The governing plan showing the capabilities of functional elements of an organization's telecommunications resources and their interaction, including configuration, integration, standardization, life-cycle management, and definition of protocol specifications, among these elements.

**Telecommunications equipment** – Routers, switches, Private Branch Exchanges, cell phones, etc used for various modes of transmission, such as digital data, audio signals, image, and video signals.

**Telecommunications service** – Any service provided by a telecommunications provider. A specific set of user-information transfer capabilities provided to a group of users by a telecommunications system. The telecommunications service provider has the responsibility for the acceptance, transmission, and delivery of the message. The telecommunications service user is responsible for the information content of the message.

**Test plan** – A plan for evaluating a system, component, network, product, project, etc. to identify differences between the expected and actual behavior.

**Third party** – A contractor or person or other entity that is external to the organization.

**Total cost of ownership study** -- As it applies to telecommunications, a study to determine or estimate an organization's total cost of its owned/leased networks/voice/data/ video services, including acquisition, implementation, administration, maintenance, support, training, software upgrades, etc.

**Training plan** – A detailed schedule, scheme, program, or method documenting training that is needed and intended to be provided.

**User requirements study** – The technical requirements for hardware, software, facilities, personnel, procedures, technical data, personnel training, verification matrices, spares, repair parts, and consumables needed to test, deploy, operate, and maintain a system, network, investment, or project. Also called Requirements Analysis.

**Validation plan** – A plan for evaluating a system, component, network, product, investment, project, etc. during or at the end of the development/acquisition process to determine whether it satisfies specified requirements.

**Video service** – An electrical signal containing timing (synchronization), luminance (intensity), and often chrominance (color) information that, when displayed on an appropriate device, gives a visual image or representation of the original image sequences. Visual communication. Motion pictures are the essence of video, and video is the essence of true and full communications.

**Virus** – A dangerous or destructive program that alters stored files or system configuration and copies itself on to external disks or other computers.

**Virtual private network (VPN)** – A public circuit-switched service offered by long distance phone companies which makes use of the public switched telephone network. VPNs are a means of augmenting a shared network on a secure basis through encryption or tunneling. Such a shared network could be an Internet Protocol network or the Internet, or an Intranet, or a frame relay network. Tunneling involves encapsulation of encrypted data inside IP packets or frame relay.

**Voice service** – Pertains to those frequencies within that part of the audio range that is used for the transmission of speech. Sound communication.

**Wide area network (WAN)** – A network typically extending a local area network (LAN) or metropolitan area network (MAN) over telephone common carrier lines to link to other LANs or MANs. A WAN typically uses common-carrier leased lines, for example, from an analog phone line to a T-1 line. The jump between a LAN or MAN and a WAN can be made through a device called a bridge or a router.