



NASA's Telecommunications Provider

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NASA Integrated Services Network (NISN) Standard Operating Procedure for Trouble Reporting, Activity Scheduling, Mission Freeze, and Major Outage Notifications

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NISN Standard Operating Procedure for Trouble Reporting, Activity Scheduling, Mission Freeze, and Major Outage Notifications

1. Purpose

The purpose of this document is to define the NISN operational procedures associated with trouble reporting, activity scheduling, mission freeze, and major outage notification. It is intended to provide a clear, concise description of these network management processes as established, along with the associated responsibilities. A brief overview of the various NISN Operation Centers is also provided including respective functions, inter-relationships, and contact information.

2. Scope

The principal goal of this document is to ensure effective and efficient communications, coordination, and decision-making between the NISN Operation Centers and the user community, particularly in regard to trouble reporting, activity scheduling, mission freezes, and major outage notifications. Clear communication is essential to provide quality Wide Area Network (WAN) services to NISN's worldwide customers.

The nature of NASA business now requires an increased ability to work across centers, generating requirements that, by their nature, are best met at the agency level. The shift in how information and knowledge are generated, used and managed when coupled with the competition for limited budgets dictates a more strategic approach to providing information infrastructure services across NASA. There are a number of NASA specific drivers for approaching IT systems more strategically. These include:

- Improving NASA's IT infrastructure to meet the NASA Vision and Strategic Plan
- Positioning the IT infrastructure to support Agency-wide applications such as Integrated Enterprise Management (IEM), NASA's Operational Messaging and Directory (NOMAD) service, and Corporate Virtual Private Network (CVPN)
- Ensuring availability of integrated services across Centers
- Supporting a robust collaborative program and management environment
- Achieving reduced cost of services to customers
- Improving security
- Delivering consistent, quality services to customers

Fundamental concepts involved in providing and receiving quality network services include classes of service with varying levels of service delivery and restoration

priorities. Additionally, NISN services are supported by network architectures with varying degrees of redundancy and survivability, depending on the class of service. NISN operates two Help Desk call centers, each with primary responsibility for particular classes of service. NISN also operates multiple Network Management Centers and coordinates the activities of numerous field support organizations, including commercial carriers and local center IT providers. The processes governing these areas are critical to successful operation and management of NISN. The procedures and responsibilities defined in this document are applicable to NISN Operation Centers and NISN customers (domestic and international) and refer to all types and classes of NISN services. Refer to the NISN Services Document, NISN-001-001, for a full description of NISN classes of service.

3. Definitions

- a. 8 x 5 - Time period that extends for a typical 8 hour work day Monday through Friday.
- b. 24 x 7 - Time period that extends for 24 hours each day of the week.
- c. Activity - Refers to any planned operational, maintenance or upgrade action associated with a NISN service that has the potential to produce a temporary interruption of service.
- d. Back-Out Plan - Defines the action required to abort an activity and return to original condition.
- e. Best Effort - Scheduling of an activity at the most appropriate time period so that it has the least impact to services.
- f. L-24 Hours - A time period of 24 hours prior to a launch.
- g. L-4 Hours - A time period of 4 hours prior to a launch.
- h. Make Operable Activity - Situations that require expedited action be taken in order to effect restoration of impacted services, or to mitigate a potential service impacting condition.
- i. Network Outage - Unplanned, temporary interruption of service. A network outage involving core infrastructure equipment/services that affects a significant customer base, such as isolation of a NASA site, is considered a Major Outage. An outage to a mission service scheduled for support is also considered to be a Major Outage. An equipment or service outage that does not meet criteria necessary to qualify as a Major Outage is by default a Minor Outage.
- j. No Comment Objection - If a planned activity has been announced and the affected site(s) does not respond with questions, comments, or concerns within a 5-day calendar period, the activity will be considered scheduled as announced.
- k. Over 7 Report - Report containing status of efforts underway to resolve Trouble Tickets (TTs) that have been open for more than seven calendar days.

- l. Order-Wire Hotline - Conference call system used for notification and communication among multiple operational organizations simultaneously.
- m. Trouble Ticket - Database record used for documenting and tracking problems.

4. References

- a. NISN-001-001, NISN Services Document
- b. Memorandum of Agreements between NISN and the Centers for Host Center Support
- c. Customer Operating Level Agreements (OLA)
- d. 452-ICD-SN/NISN, Interface Control Document between the Space Network and NISN
- e. NASCOP, NASCOM Operations Procedures document

5. Quality Records

- a. Activity Scheduling Database System (Major Outage Notifications, NISN Daily Outages & Activities Report, Activity Notices, Activity Requests, Activity Notification Messages, NISN Communications Network Freeze Notification Messages, Freeze Exemption Requests, FER Explanations for Denial, Service Restoration Notices, Final Reason for Outage Notices)
- b. Trouble Ticket Database (Trouble Tickets, Over 7 Trouble Ticket Reports)
- c. Metrics (Sustaining Service Performance Levels)

6. NISN Services Management

NISN services as designed and implemented typically include the capability to allow proactive monitoring, fault management, out-of-band access, metrics reporting, and configuration management. This provides the means to quickly identify and isolate problems that may include failures or degradation of service. Faults are reported to centralized management servers and geographically diverse backup management servers. Indication of faults including nature of alarm and severity are displayed on management systems monitored 24 x 7 by service management staff that review and respond appropriately to alarm conditions. Primary management of networked devices is performed through in-band secure communications sessions. Out-of-band access via diverse connectivity paths provides management access to core devices in the event a failure prevents in-band management access. Business continuity plans are maintained and exercised to help assure that service integrity is preserved during an event that renders primary physical, electrical or logical management infrastructure unusable.

6.1 NISN Operation Centers

To ensure a rapid response to user inquiries, NISN currently operates two Help Desk facilities with appropriately trained staff. Located at the Marshall Space Flight Center

(MSFC) and the Goddard Space Flight Center (GSFC), the NISN Help Desk facilities are staffed 24 x 7 annually. Each Help Desk has primary responsibility for a specific set of NISN systems/services; however, customers may contact either center. NISN encourages users to contact the Help Desk with primary responsibility for their particular service. Primary systems/services for each center are shown in Table 1, Primary Responsibilities by NISN Operations Center. If there is any question of where to report a problem or whom to contact for general NISN information, contact the MSFC Operation Center.

Table 1. Primary Responsibilities by NISN Operations Center

NISN System/Service	GSFC Primary	MSFC Primary
Conversion Device (CD) / Small Conversion Device (SCD)	X	
Custom (Mission)	X	
Dedicated Mission Voice and Data	X	
High Rate Data/Video	X	
International (Mission)	X	
Mission Routed Data	X	
Application Services		X
Broadcast Fax		X
Custom (Mission Support)		X
Data Center Network & Security Services (DCNSS) (see NSD for detailed listing)		X
Domain Name Service (DNS)		X
International (Mission Support)		X
Intrusion Detection		X
Mission Support Routed Data		X
NASA X500		X
NISN Support Applications		X
Russia Services		X
Switched Voice		X
Video Teleconferencing (ViTS) w/Video Rollabout (VRA) and Desktop Video		X
Layer 2 Virtual Private Network (L2VPN)		X
Voice Teleconferencing (VoTS)		X

6.1.1 MSFC Operation Center

The Operations Center at MSFC has primary responsibility for day-to-day non-mission related systems/services. The MSFC Operation Center consists of the NASA Information Support Center (NISC), Enterprise Network Management Center (ENMC),

Video Teleconferencing Center (VTC), and Russia Services Group (RSVG). The NISC is responsible for first level Help Desk support and includes general user interface and TT administration. The ENMC is responsible for overall network management, including service implementation, sustaining operations, trouble resolution, network maintenance activities, major outage notification, and network event and alarm monitoring. The NISC can be reached by phone at 1-800-424-9920 or (256) 544-1771. If for any reason the NISC cannot be reached, contact the GSFC Operation Center (See paragraph 6.1.2).

The NASA VTC provides video bridging support and acts as a back-up monitoring station for the vendor Video Bridging Service (VBS) during high visibility periods, such as select conferences related to Space Shuttle mission activities. While the VTC is normally located at an off-site contractor facility, the VTC staff will operate from the MSFC Gateway during special events or as circumstances warrant such as a power outage. The VTC hours of operation are Monday-Friday, 6 am-5 pm Central, and can be contacted at 256-961-9387 or 9388. The VBS can be contacted at 1-877-789-0670.

6.1.2 GSFC Operation Center

The Operation Center at GSFC, referred to as the NASA Communications (NASCOM) Operations Management Center (NOMC), has primary responsibility for day-to-day mission-related systems/services. The NOMC consists of the Communication Manager (COMMGR), who performs the primary Help Desk function and supports day-to-day network operation management; the Goddard Comm Control (GCC), responsible for router management, data circuit monitoring/carrier coordination, and Conversion Device (CD) operations; the Voice Control section, responsible for mission dedicated voice; and the NISN Network Scheduling Group (NNSG). The NOMC can be reached at (301) 286-6141 or via the COMMGR order-wire hotlines.

6.2 NISN Field Operations

The following sections describe field operations required to operate and maintain NISN services in accordance with advertised service levels.

6.2.1 Gateways

NISN maintains staffed Gateway facilities at each NASA Center and most NASA facilities. Staffed sites include ARC, DFRC, GRC, GSFC, NASA HQ, JPL, JSC, KSC, LaRC, MAF, MSFC, SSC, VAFB, and WSTF/WSC. Gateway facilities at Boulder, CO and the NASA IV&V site in West Virginia are currently not staffed and are supported by on-site customer-provided technicians, unless dispatch of a NISN Gateway technician from another site is warranted on an as needed basis. These Gateway facilities house NISN non-mission WAN backbone and core infrastructure equipment, and serve as the main demarcation point for most NISN WAN services at the site, including backbone and tail circuitry. The Enterprise Network Management Center, an element of the MSFC Operation Center, generally manages and directs Gateway actions regarding the NISN equipment and circuitry. Staffed Gateway facilities are operated 8 x 5 by trained NISN technicians with 24 x 7 call-out support and 2-hour response time. Diagnostic and corrective actions performed by on-site NISN Gateway technicians include: fault

isolation; reporting of visual indicators or display information on equipment or consoles; verifying physical connections; circuit testing and acceptance; power cycling equipment; shipping and receiving equipment; and physical installation and/or replacement of equipment components for trouble resolution and new service implementation.

6.2.2 CIEFs

The NISN non-mission WAN backbone architecture includes five Carrier Independent Exchange Facilities (CIEFs) located in Atlanta, GA; Chicago, IL; Dallas, TX; San Jose, CA; and Washington, DC. These leased facilities house core backbone infrastructure equipment, provide ready access to multiple diverse common carrier services and allow diversity and alternate routing capability. Similar to the Gateway concept of operations described above, the ENMC manages and directs CIEF actions regarding the NISN equipment and circuitry. Unlike the Gateways, however, the CIEF locations are not staffed with NISN personnel. In the event of problems involving equipment at a CIEF location, the ENMC will utilize the technicians on staff at each facility to aid in problem diagnosis and resolution for this remote NISN equipment. The CIEF facilities have trained personnel available 24 hours a day 7 days a week to support similar diagnostic and corrective actions as described for the NISN Gateways. These services are provided by direct, full-time CIEF support personnel under contract to NISN and are performed in compliance with specified NISN standard operating procedures and stated Service Level Agreements (SLA).

6.2.3 Host Center Support

NISN mission WAN infrastructure equipment is not located in the Gateway areas, but rather integrated with or in close proximity to customer mission equipment areas. Mission operations typically have higher service levels (2 hours and < 1 minute) which often require 24 x 7 on-site support to successfully meet restoral times. Although there are no NISN personnel on-site in mission customer facilities, these facilities are typically staffed 24 x 7 so NISN must rely extensively on support provided by the Host Center for troubleshooting, equipment resets, vendor escort, etc. These trained on-site personnel have strong data communications experience necessary to effectively support troubleshooting and service restoration efforts. NISN often relies on the Center's test equipment as well in order to troubleshoot communications problems.

7. NISN Trouble Reporting

This section documents the process and responsibilities for NISN trouble reporting starting with an end-user call or NASA Center Help Desk call to report a problem. It progresses through the tracking and reporting of TTs, the process for transferring responsibility of a TT between NISN Operation Centers, the coordination of restoration activities between multiple Network Management Centers and field support organizations, and culminates in customer notification of service restoration/delivery. The general trouble reporting processes for both non-mission and mission services are outlined below, and are followed by specific procedures and requirements applicable to several major user groups. Suspected mission and non-mission network security

related incidents should also be reported via these same processes. Operations Center interoperability provides a number of key functions:

- a. Customers may call either Operations Center.
- b. A single TT system is used to document and track all NISN troubles.
- c. All mission service related problems are reported to the COMMGR.
- d. Problems are transferred to the responsible Operations Center with minimal customer involvement.
- e. The Operations Center with primary responsibility for the problem or TT will typically communicate with the customer(s) upon closure.

7.1 Customer Reporting – General

Regardless of whether the trouble being reported is a mission or non-mission service, the individual reporting the trouble is required to provide specific information to the Help Desk representative. This critical information is used by the investigating maintenance agency to identify, troubleshoot, isolate the problem, and when applicable, report the trouble to the appropriate commercial carrier.

The following information is required when opening a TT:

- a. First and Last name of the person reporting the trouble (customer provided).
- b. Phone number/Electronic Mail (e-mail) address of the person reporting the trouble (customer provided).
- c. Organization of the person reporting trouble (customer provided).
- d. User location (customer provided).
- e. Problem Description (customer provided).
- f. Unique Identification (ID): circuit number, IP address, router name, etc. (if not available, the customer may provide the “to” and “from” locations).
- g. Object type (an indication of mission or non-mission and specific service affected must be provided by the customer).
- h. Mission Trouble Reports require the reporting person’s Mission Operations Center (MOC) or Project (customer provided).

7.2 Trouble Reporting and Resolution Process

The overall NISN trouble reporting and resolution process is depicted in Figure 1, Trouble Reporting and Resolution Process, and is described in the following sections.

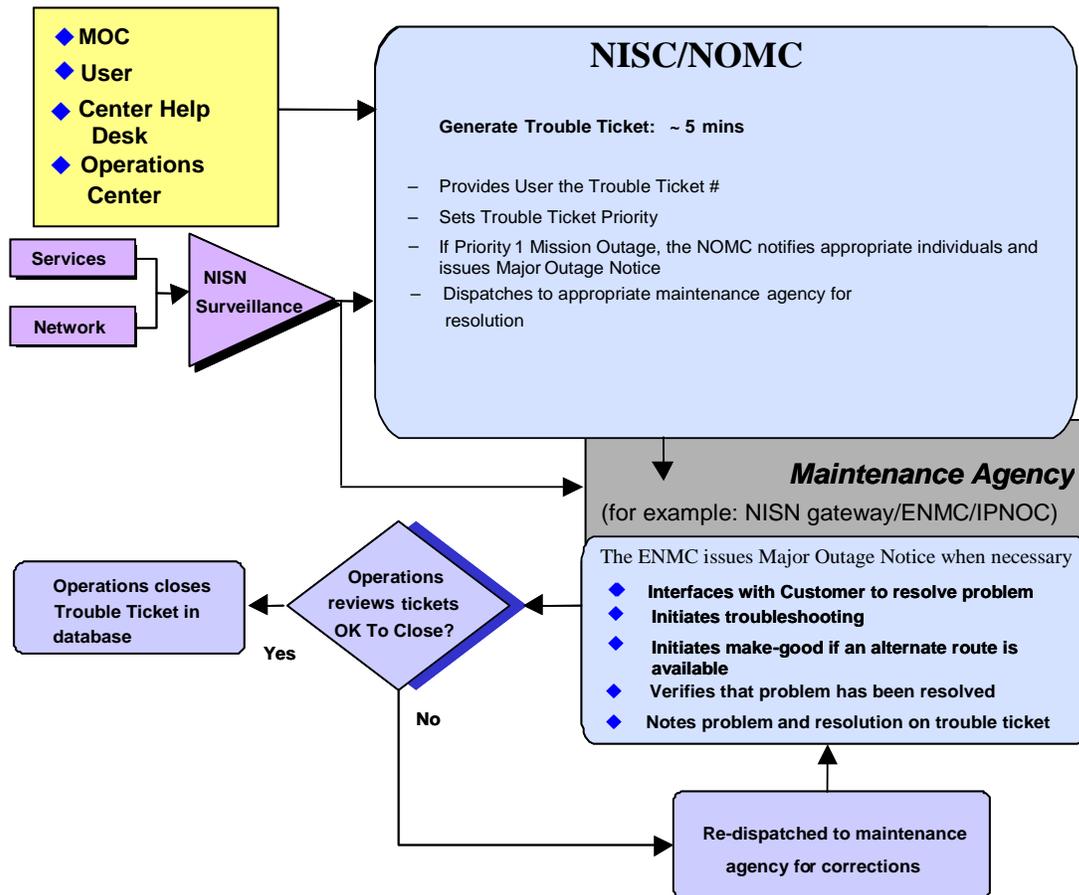


Figure 1. Trouble Reporting and Resolution Process

7.2.1 TT Priority

TTs are assigned a priority based on several factors including severity of impact, number of customers affected, category of service (mission, non-mission, premium, standard, etc.) and other predefined special considerations. Priorities are defined as:

- a. Priority 1 – The impact is major system outage with a large number of users affected. Examples include network switch or core router outage, major carrier service outage such as SONET backbone circuit or peering, ViTS room outages, and all troubles related to mission services that are mission impacting. Notifications of major outages are issued as discussed at Section 10, NISN Major Outage Notification.
- b. Priority 2 – The impact affects multiple users. Examples include user router outage and loss of system redundancy.
- c. Priority 3 – The impact affects a minimum number of users. Examples include LBV impairments and individual IP related issues.

7.2.2 Trouble Reporting

NISN service trouble reporting can originate either internally or externally. Internal NISN surveillance is accomplished by the various Network Management Centers by means of proactive network management system event and alarm monitoring. Detected troubles are recorded in the NISN Trouble Ticketing System and assigned to the responsible maintenance organization for resolution. Likewise, upon receiving an external call, the NISC or NOMC will open a TT in the NISN Trouble Ticketing System and provide the customer with the ticket number for future reference. The NISC/NOMC will assign/coordinate the TT to/with the responsible maintenance organization for resolution.

Once a ticket has been coordinated with and assigned to the responsible service organization, the resolution efforts are monitored until service is restored, the customer notified and the TT closed. Priority 1 TTs are reported daily on the NISN Daily Outages and Activities Report, which can be subscribed to via either the Activity and Outage Posting and Notification System (AOPNS) or the Mission Outage Notification System (MONS). For more information on how to subscribe to the NISN Notification systems, contact the primary NISN Help Desk, NOMC or NISC, at the center where the trouble originates.

7.2.3 TT Monitoring and Tracking

The process of monitoring and tracking network problems and service anomalies is shown at Figure 2, Trouble Ticket Monitoring and Tracking. Occasionally, a service will exhibit intermittent problem characteristics, which require additional monitoring to ensure stability after service restoration activities are completed. An Over 7 TT report is generated daily. This report contains the status of efforts underway to resolve TTs that have been open for more than seven calendar days. NISN Operations Management is responsible for reviewing the report to determine if additional resources are necessary to resolve the problem.

7.2.4 Mission Trouble Reporting-Specific

The COMMGR in the NOMC controls all mission-related trouble calls to the GSFC Operation Center. Mission-related trouble calls received by the NISC are coordinated with and controlled by the GSFC COMMGR. The GSFC COMMGR is responsible for determining if there are program/project impacts to mission services or scheduled supports. Upon identification of a problem such as a Major Outage, the COMMGR is responsible for informing management and the affected customers through the most appropriate NISN notification system, either MONS or AOPNS depending on the class of service.

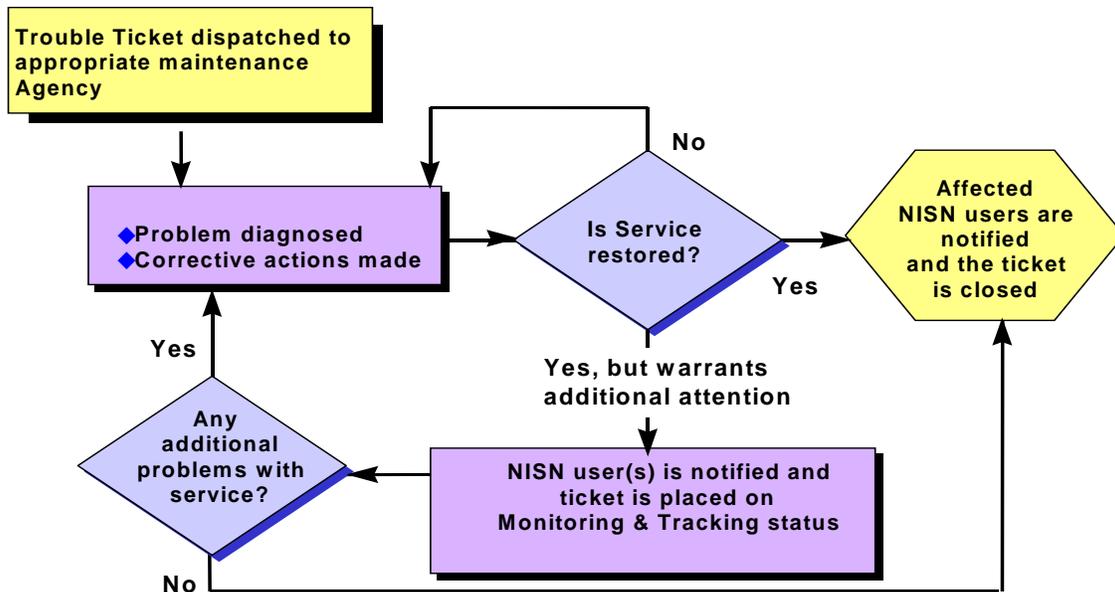


Figure 2. Trouble Ticket Monitoring and Tracking

The NISN Operation Center receiving the call will log the problem into the TT system and provide a unique TT number to the customer. This ticket number allows the customer to call and obtain status on the problem at any time. In the event services are deemed by the agency to be mission critical, the COMMGR will make frequent and periodic status calls directly to the customer. The responsible NOMC technical sections must then respond immediately to investigate and correct the situation. The NOMC will actively track the resolution efforts until the problem has been resolved, the customer notified, and the ticket closed.

7.2.5 Operation Center Interface Process

When a NISN Operation Center receives a trouble report for a service, which is not that center's primary responsibility, the action is immediately transferred to the center with primary responsibility. A conference call or order-wire hotline will be used to notify the other NISN Operation Center that the TT has been assigned. After the trouble is resolved, the responsible center will notify the customer and close the TT. These advisory calls and closing comments will be documented in the NISN Trouble Ticketing System. Both the MSFC and GSFC Operation Centers use the same Trouble Ticketing System application server; therefore, tickets opened or closed by either location are accessible to both centers.

7.2.6 Specific Procedures and Requirements for Major User Groups

Trouble reporting for Space Station and certain mission-related PIP customers deviates from the established procedures in that individuals supporting these services are encouraged to contact the NOMC for all problem reporting. The GSFC COMMGR is responsible for maintaining an awareness of NISN impacts to NASA's mission communications customers and will typically provide official notification to these

customers even though technical support personnel at both support centers may perform the actual problem resolution.

7.3 Non-mission IT Security Incident Response

All NISN resource users are responsible for reporting any known or suspected IT security incidents. It is essential that individuals with knowledge of an incident exercise due caution not to disclose incident-relative information outside the “need to know” chain of information dissemination. Failure to do so may impede or preclude the Government’s chance of obtaining a conviction if a crime is discovered, or possibly subject NASA to undo embarrassment or present/create a legal liability situation if what appears to be a crime later proves not to be. The NISN non-mission incident response capability is comprised of two elements, the NISN Security Operations Center (NSOC) and the Intrusion Detection/Incident Response (ID/IR) team. The NISN network is monitored on a 24x7 basis for security incidents. The NSOC functions as the first line of defense for Agency assets connected to the NISN non-mission WAN. The NISN incident response course of action is different for an internal event versus an event in which NISN is only functioning as a transport. A NISN internal event is defined as an event that involves network infrastructure devices, workstations or servers, while an external event only involves computer systems beyond the NISN network demarcation point and for which NISN is functioning as the transport for the event in question. If an event is detected, NSOC will notify the ID/IR team (or on-call analyst) who will assist in the verification of all high priority events. If the event is deemed high-priority, the contractor IT Security Operations Manager notifies and coordinates with the NISN Computer Security Official (CSO) to determine the appropriate next steps and actions to complete. NSOC, in coordination with the NISN CSO, contacts the affected Center’s IT Security Manager (ITSM) or his/her designee and provides pertinent information associated with the high priority event. A high priority email will be sent to the affected Center’s ITSM or his/her designee which will provide information for the site Computer Incident Response Team. If the event is determined to be of an external nature, the NISN CSO coordinates with the appropriate NASA Center ITSM to determine what supporting role and/or actions are necessary for the NISN ID/IR team to accomplish, such as implementing Internet Protocol (IP) blocks at the NISN demarcation points (either Center border routers or public network peering points). If it is determined that there is a NISN internal system compromise, the NISN ID/IR team, in coordination with the NISN CSO, ensures that the necessary forensics analysis is performed and follow-on investigative actions are supported and completed.

8. NISN Activity Scheduling and Notification

The responsibilities of each NISN organization/supplier, as they relate to scheduling network activities with the potential to interrupt or impact NISN telecommunications services, are defined in this section. The overall process is illustrated below in Figure 3, NISN Activity Scheduling Procedure.

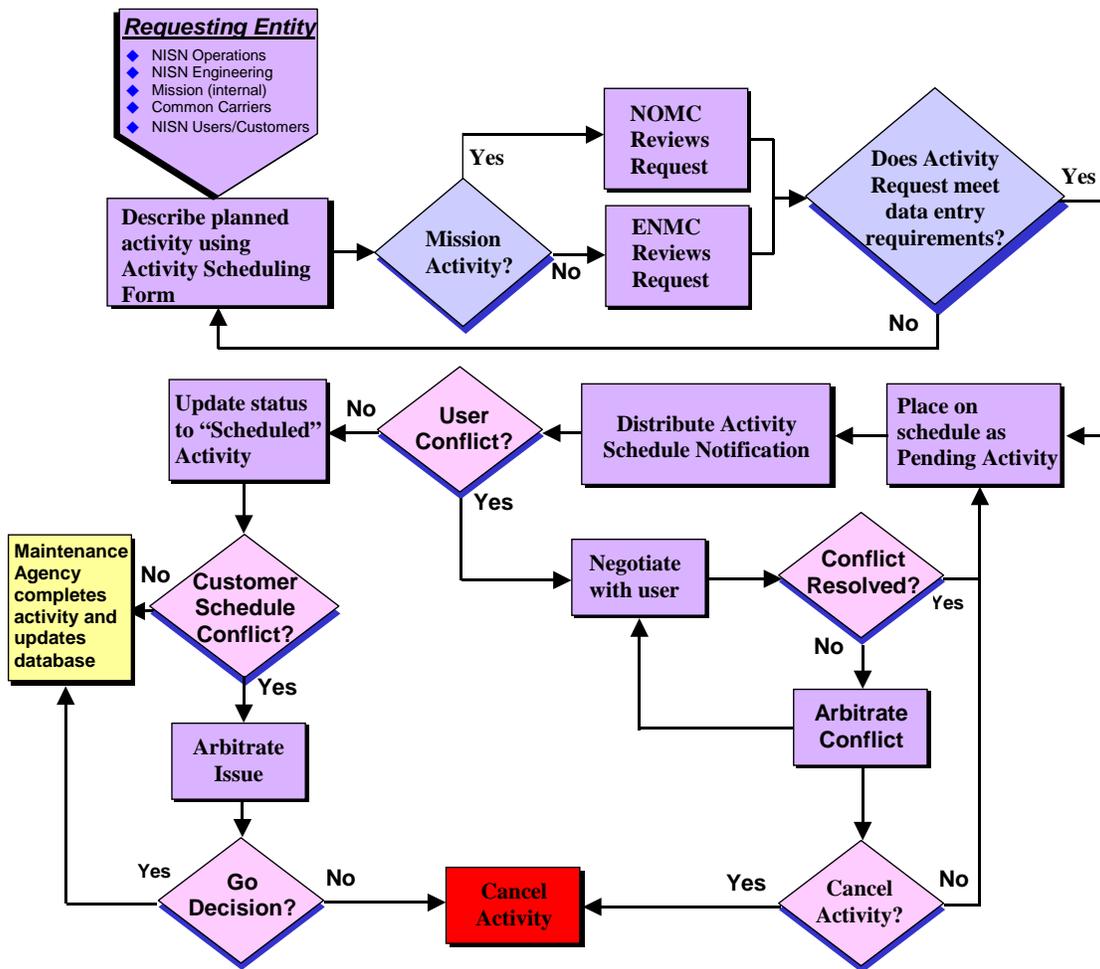


Figure 3. NISN Activity Scheduling Procedure

All changes to the production network having a realistic potential to interrupt or impact user services are accomplished through an activity. An activity, by definition, is any planned action that may produce a temporary interruption of service to a center, program, project, or group of customers. Actions classified as routine activities include, but are not limited to, normal circuit installations, system hardware/software upgrades, facility maintenance, equipment moves, and change out. Make operable activities pertain to situations that require expedited action be taken in order to effect restoration of impacted services, or to mitigate a potential service impacting condition. The major features of NISN's activity scheduling and notification process are described below:

- a. The notification is distributed to all appropriate personnel via e-mail.
- b. Fast and effective communication with affected customers for any questions or concerns regarding planned outage or reduced service activities.
- c. Routine mission activities are scheduled 5 calendar days in advance, while routine non-mission activities must be scheduled 10 calendar days in advance unless specifically coordinated with and approved by the affected customer(s).

- d. Special provisions apply for make operable activities, including performing customer scheduling/notification on a best effort basis.
- e. An arbitration/communication process that facilitates a quick resolution when potential scheduling conflicts exist between NISN and the customer.
- f. The NISN Network Scheduling Group (NNSG) schedules Mission network activities.
- g. The ENMC schedules Non-mission network activities.
- h. Special cases can be accommodated.

NASA Centers and most programs require virtually uninterrupted telecommunication and data transmission services. Conversely, NISN must on occasion unavoidably bring part of its transmission system down to perform various upgrade, maintenance and new service implementation activities. To accommodate these and other critical events, rapid communication, coordination, organization, and scheduling are necessary to eliminate conflicts during the activity scheduling process. When scheduling an activity, NISN will make every reasonable effort to work around customer workloads, scheduled supports and critical service periods.

Activity Requests can be submitted by various NISN support organizations including NISN Operations, Engineering and Maintenance groups; common carriers; and Mission (internal). Activity notices are generated utilizing the Remedy-based NISN Activity Scheduling System using a common format and written in simple communications statements in order to enhance understanding of pending NISN actions. These activity notices are then distributed to affected customers via AOPNS and/or NNSG Activity Notice messages. AOPNS provides a web interface that allows NISN personnel and NISN customers to subscribe to all or a subset of the published notices. The subscriber can define Key Words or a Key Phrase of interest such that only notices containing one or more of the Key Words or the entire Key Phrase will be sent to him/her. Examples of AOPNS subscribers include NISN Center, Program and Site Representatives, Center Local Area Network (LAN) Managers, and Mission Service Managers.

If it becomes apparent that an in-progress activity will exceed its scheduled window, the customers will if possible be notified immediately by e-mail and/or telephone, and impact considerations and back-out plans will be evaluated. The time between the scheduled completion time and the time service is actually restored will be classified as an outage. A TT will be generated to document the outage.

8.1 Non-mission Services Activity Scheduling Process

This section defines the process for scheduling NISN non-mission activities. The process consists of the Activity Request, which, unless otherwise coordinated with the customer, requires 10 calendar-days notification (a 5-day general notice, followed by a posting for 5 days). The intended goal of scheduling NISN maintenance activities ten days in advance and publishing the activities to the user community is to avoid unexpected impacts to end user services thus minimizing disruption of Agency efforts due to network maintenance. Once a planned activity has been announced, the

affected site(s) have 5 calendar days to respond with questions, comments or concerns. Refer to Figure 4, Sample Activity Notification Message. A no response within the 5-day general notice period will be perceived by NISN as a “no comment/objection” response to the planned activity and the activity will then be considered scheduled as announced.

Activity Notice: #33990 GSFC (NONE) MCI TO REMOVE PS19 RECTIFIER FROM MCI OWNED CABINET (BAY-1014) IN THE GODDARD GATEWAY.	
Notice Date: Tue Jan 3 12:10:00 CST 2006	
Unless otherwise noted, all dates and times are displayed in Central Time.	
An extended Activity list is available at http://msvictor1.msfc.nasa.gov/NISC/activities/activitiesreport.xls	
Activity No.:	000000000033990
Create-Date:	01/03/2006 10:19:58
Status:	New
Activity Type:	NETWORK
Sites:	GSFC
Requester:	DAVID J. SMITH
Requester Phone No.:	301-286-6199
Start Date/Time:	01/12/2006 23:00:00
Stop Date/Time :	01/13/2006 05:00:00
Service ID:	NONE
Short Description:	MCI TO REMOVE PS19 RECTIFIER FROM MCI OWNED CABINET (BAY-1014) IN THE GODDARD GATEWAY.
User Impact Details:	No User Impact
Detailed Description:	1/3/2006 10:19:58 AM smithdj MCI is performing a power feed replacement to Bays-1817, 1818 & 1819 (MCI equipment) from the existing power source in Bay-1017 to the new power source in Bay-1014. Only one side of the power to the equipment will be changed at a time. The A-feed will be dropped first from bay 1017 and verified on the new power source in Bay 1014 and then the B-feed would be completed. MCI will then remove old rectifiers and batteries from Bay-1017. *** New Notification sent to NISC***
System Impact:	NONE
Activity Coordinator:	DAVID J. SMITH
Coordinator Phone No.:	301-286-6199
Participating Maintenance Agencies:	GSFC GTWY, MCI
Reason for Activity:	Perform power feed replacement to Bays-1817, 1818 & 1819 (MCI equip). Current power feed is from Bay-1017. New feed will come from Bay-1014.

Figure 4. Sample Activity Notification Message

Non-mission activity requests, once accepted as a pending activity, are distributed to NISN site Customer Service Representatives (CSR) using AOPNS. It is the responsibility of these site representatives to ensure that their respective user communities have been notified and are fully aware of the planned actions. Likewise, when an activity is canceled or rescheduled within 72 hours of the originally scheduled time, the scheduling party will notify the site CSR who will in turn notify their user community in concert with the automated AOPNS notification. Pending activities are added to the following day's NISN Daily Outages and Activities Report, which is available through both AOPNS and MONS. If no objections are raised to the scheduling of the activity within 5 days, the status of the activity will be upgraded to a scheduled activity. If customer issues or conflicts are raised during the final 5 days of the activity-scheduling period, the activity may be challenged using the same process described in Section 8.5, Activity Scheduling Conflicts - Arbitration/Resolution Process. Should this process not result in an agreement on the scheduled activity, the NISN Project Manager will resolve the conflict.

8.1.1 Non-Mission Activity Scheduling Rules

The following rules apply to NISN non-mission activity scheduling:

1. Routine activities, such as NISN Service Request (NSR) implementation, Carrier maintenance, and hardware/software upgrades require 10 calendar days advance notice prior to being performed, unless specifically coordinated with and approved by the affected customer(s).
2. When outages or diminished services occur in the network or a condition exists which poses a significant potential for impacting services, make operable activities are allowed to be worked on a real-time or expedited basis, with customer scheduling/notification performed as a best effort by the NISN Operations Center with primary responsibility.
3. On the day of Space Shuttle launch or landing, the only activities allowed to be scheduled are those in support of expedited NSRs and TTs.
4. NISN Operations Management or ENMC has the responsibility to disapprove/cancel any activity which they determine might adversely affect the network.
5. It is the responsibility of the NISN site CSR to notify their customers of any activity schedule that could potentially impact their service.
6. At the end of the 5-day notification period, the activity is considered scheduled as announced. For submitting objections to a proposed schedule, refer to Section 8.5, Activity Scheduling Conflicts - Arbitration/Resolution Process.
7. Carrier circuit activities are scheduled with the ENMC. (*NOTE: Carriers, at their own discretion, may not always adhere to the NISN 10-day rule*)
8. Non-mission common carrier T-1 and sub-rate data-lines are scheduled by the ENMC or the appropriate NISN GTWY.

8.1.2 ENMC Responsibilities

The ENMC is responsible for the following actions:

1. Act as focal point for non-mission activity requests.
2. Maintain all activity scheduling guidelines as they pertain to NISN non-mission network infrastructure and services.
3. Review all data contained on submitted activity requests, and interface with the requester when additional information is required.
4. Ensure there is not a direct conflict with other scheduled activities or critical events.

8.2 Mission Services Activity Scheduling Process

This section defines the process for scheduling NISN mission activities. Once the NNSG has received an activity request, a circuit release alert/activity notice message will be e-mailed to the affected users 5 calendar days in advance announcing the anticipated impact and the proposed date and time for the activity. If a customer raises a concern regarding the activity request, the NNSG will work with the requestor to resolve any scheduling conflicts, or reschedule the activity. If no objections are received, the activity will commence as scheduled. The NNSG will also enter the scheduled activity in the Remedy-based NISN Activity Scheduling System for inter-center notification. New activities are added to the following day's NISN Daily Outages and Activities Report, which is available through both MONS and AOPNS. The COMMGR will be notified by the requestor prior to and at the conclusion of the scheduled activity. The COMMGR will notify the affected NASA center/user at least 10 minutes prior to taking the service/circuit offline, and when it is restored.

8.2.1 Mission Activity Scheduling Rules

The following rules apply to NISN mission activity scheduling:

1. Routine activities, such as NSR implementation, Carrier maintenance, hardware/software upgrades, and site power work require a minimum of 5 calendar days advance notice prior to being performed, unless specifically coordinated with and approved by the affected customer(s).
2. When outages or diminished services occur in the network or a condition exists which poses a significant potential for impacting services, make operable activities are allowed to be worked on a real-time or expedited basis with NISN Operations Management or COMMGR approval, and with customer scheduling/notification performed as a best effort by the NISN Operations Center with primary responsibility.
3. On the day of an Expendable Launch Vehicle (ELV) or Space Shuttle launch or landing, the only activities allowed to be scheduled are those that have been approved by the Freeze Exemption process or in real time by the COMMGR in emergency situations.

4. NISN Operations Management or COMMGR has the responsibility to disapprove/cancel any activity which they determine might adversely affect the network on the scheduled date of activity.
5. It is the responsibility of NNSG, and the NISN site CSR to notify their customers of any activity schedule that could potentially impact their service.
6. At the end of the 5-day notification period, the activity is considered scheduled as announced. For submitting objections to a proposed schedule, refer to Section 8.5, Activity Scheduling Conflicts - Arbitration/Resolution Process.
7. All carrier circuit activities are scheduled with NNSG, or in real time with the COMMGR. (*NOTE: Carriers, at their own discretion, may not always adhere to the NISN 5 day rule*)

8.2.2 NNSG Responsibilities

The NNSG is responsible for the following actions:

1. Act as focal point for mission activity requests.
2. Maintain all activity scheduling guidelines as they pertain to NISN mission network infrastructure and services.
3. Review all data contained on submitted activity requests, and interface with the requester when additional information is required.
4. Ensure there is not a direct conflict with other scheduled activities or critical events.
5. Issue "Release Calendar" to the network showing all scheduled activities and circuit releases.

8.3 Scheduled Maintenance Windows

NISN has established a routine Preventive Maintenance (PM) window in order to perform actions necessary to maintain the health of the mission communications network infrastructure and services. During these windows, there may be minor impacts to NISN mission services. Preventive maintenance will not be performed during NISN network freezes and critical coverage periods. NNSG will distribute activity notices to customers as a reminder of the scheduled activity and its potential impact to services five days in advance of the routine PM window. To be included on these activity notices, customers may contact the NNSG and provide information regarding projects supported and NISN services utilized.

PM windows for NISN Mission Routed Data services are scheduled every Tuesday from 1800Z to 1830Z. During these standing PM windows, customers on IOnet can expect to see one or more minor hits lasting a few seconds. There is no impact expected for TCP/IP data flows, and there will be no loss of connectivity. Multicast/UDP data flows may drop blocks during those few seconds. Customers who may be sensitive to the

impact as described above are encouraged to take this preventive maintenance window into account when scheduling their supports. During the PM window, activities may be scheduled periodically which have a larger impact to a limited number of customers. These activities will be scheduled and coordinated with impacted customers separately through the standard NISN mission services activity scheduling process described above.

Routine PM windows are not currently established for other NISN mission and non-mission communications services. When established as determined by need, the same process will be followed as is described above for Mission Routed Data services. In the interim, windows for performing routine actions necessary to maintain health of the network infrastructure and the various services will be scheduled and coordinated on a case by case basis in accordance with the policies and procedures detailed above.

8.4 Requirements for Scheduling a NISN Network Activity

All activity requests are scheduled via the NISN Activity Scheduling System using the activity record. The following ENMC and NNSG contact information may be used as appropriate by external NISN requesters, carriers/NISN users, for submitting activity requests.

- ENMC: (256) 961-4000 or 1-800-833-0678, or e-mail at enmc@nisn.nasa.gov.
- NNSG: (301) 286-5590 or 6435, or e-mail at nmsg@ncc-comm.gsfc.nasa.gov.

Routine non-mission activity requests that are not related to restoration of service will typically require 10 calendar days advance notice unless specifically coordinated and approved by the affected customer(s), whereas routine mission activities are scheduled 5 calendar days in advance. Organizations with access to the NISN Activity Scheduling System will submit requests electronically using the Remedy-based system to schedule the activity. The NISN Activity Scheduling System upon submittal automatically assigns a unique activity/request number. All activity requests must meet the established guidelines. Mandatory fields in the Remedy activity-scheduling record must be satisfied in order for the activity to be processed. The requester must ensure all affected maintenance organizations have been notified, and all required documentation, e.g., test and back-out plans, is produced. The submitted activity will be screened for completeness and accuracy by ENMC/NNSG personnel who also are responsible for ensuring that the activity does not conflict with other network activity request(s) or scheduled support activities. Any completed activity request record deemed unacceptable will be returned to the requestor by the ENMC/NNSG to be updated with the required information.

Adding work to an existing scheduled activity that is not directly related to the original intent of the published activity schedule requires a determination be made as to whether or not the additional work modifies the nature of the user impact (i.e. Impact is broadened to encompass additional services that were not originally planned to be impacted or the duration of impact is expanded). If the additional work is determined to modify the nature of the scheduled activity, a decision must be made to either schedule

the additional work as a standalone activity and publish for the required interval, or reschedule the original activity with the additional work included and publish for the required interval. If the additional work does not change the nature of the scheduled activity, the work may be added to the description of the originally scheduled activity and published as an updated scheduled activity within the established scheduling window. Adding work to a published activity schedule that creates additional impact to the user community than that originally published without first advertising the additional impact for the required interval is not allowed.

8.5 Activity Request Preparation

Preparation of activity requests is an essential element of this process and key to its success. To be effective, activity requests must be thorough and contain accurate and detailed information. They must clearly describe the nature of the work to be performed, the services and locations involved, and how they will be affected. At a minimum, activity requests will contain the following information:

- a. Services potentially affected and how they will be affected.
- b. All potentially impacted sites.
- c. Proposed dates and times of the activity window.
- d. Primary activity coordinator and contact information.
- e. Participating maintenance agencies.
- f. Activity description.
- g. Special considerations such as travel requirements, vendor dispatches, criticality of the activity, time sensitivity, etc.

The activity coordinator is the first person to contact in order to answer questions, provide additional information, or provide initial response to concerns raised during the pending activity notification period. It is the responsibility of the requester/submitter to ensure that all activity request preparation requirements are met.

8.6 Activity Scheduling Conflicts – Arbitration/Resolution Process

The purpose of the NISN Activity Scheduling and Notification process is to ensure adequate notification and coordination for scheduling activities between NISN and any affected customers/sites. The time between notification and the actual activity has been designed to provide sufficient time for customer planning and includes an opportunity for major issues and concerns to be raised/escalated.

After notification of a pending activity, the appropriately designated NISN Center Representative, NISN CSR, Center Customer Commitment Manager (CCCM) Representative, LAN Manager, or their designee should initially discuss questions and concerns with the Activity Coordinator. Activity Coordinator contact information will be included as standard information in each activity notification. Although certain specific circumstances may dictate otherwise, most issues should be easily resolved at this level by mutual accommodation.

When a solution cannot be reached quickly and easily, it will be the responsibility of the NISN Center Representative or designee to contact the appropriate Information Services Department (ISD) Representative(s) with responsibility for the particular service(s) in question. For example, if NASA Data Center (NDC) personnel at Johnson Space (JSC) have a major concern over a pending Backbone Network activity and a resolution is not obtained by working directly with the Activity Coordinator, the JSC NISN Center Representative would contact the ISD Representatives responsible for NACC and Backbone Services. These individuals, along with appropriate supporting personnel, will endeavor to reach a mutual solution or alternative. If, after a reasonable amount of time and effort, a solution cannot be agreed upon, the NISN Project Manager will make the final decision whether to proceed as scheduled or cancel/reschedule the activity.

8.7 NISN Customer Scheduling Awareness (NCSA) for Non-mission Customers

This section defines the process for generating and tracking NISN customer events in an effort to coordinate and avoid conflicts with NISN scheduled maintenance activities. NISN CSRs, who interface regularly with customers in their areas of responsibility, will collect input regarding significant upcoming events such as critical teleconferences, simulations, power outages, and special data flow schedules. The NCSA system web interface allows the CSRs to then submit this customer activity/event scheduling information for the purpose of promoting NISN awareness associated with scheduling network activities. The NCSA system subsequently provides notification to NISN Customer Service, Engineering and Operations groups regarding these events. The system also provides a feedback mechanism for NISN customer coordination and clarification of activity/event details such as impact assessments. This bulletin board-like service in no way supersedes the formal NISN activity scheduling process described above, but rather provides a means for encouraging increased dialog between appropriate parties relative a given customer event.

The overall process is illustrated below in Figure 5, NCSA Workflow Diagram. Specific features and responsibilities associated with this customer scheduling awareness service include the following:

- a. NCSA postings generate email notifications which are sent to NISN organizations responsible for activity scheduling and coordination including Customer Service, Operations and Engineering.
- b. Each organization acknowledges the original customer event submission in NCSA, and is able to respond by adding comments to the bulletin board thread which generates new email alerts concerning the additional information.
- c. NISN Customer Service, in coordination with Operations and Engineering, is responsible for ensuring that the customer is aware of any potential service impact.
- d. Once a customer event is acknowledged, the system provides the mechanism for maintaining sensitivity, awareness and coordination dialog.

- e. Customer events can only be rescheduled and/or canceled by the originator. Additionally, NCSA events can be completed or will expire automatically 24 hours after the event stop time and date.
- f. The Main Event Page provides the ability to initiate a discussion thread at anytime.
- g. Events can be entered as a one time or standing event (e.g. every Monday at 9:00 am.)
- h. Interested parties are kept in the loop via NCSA system notifications and discussion threads.

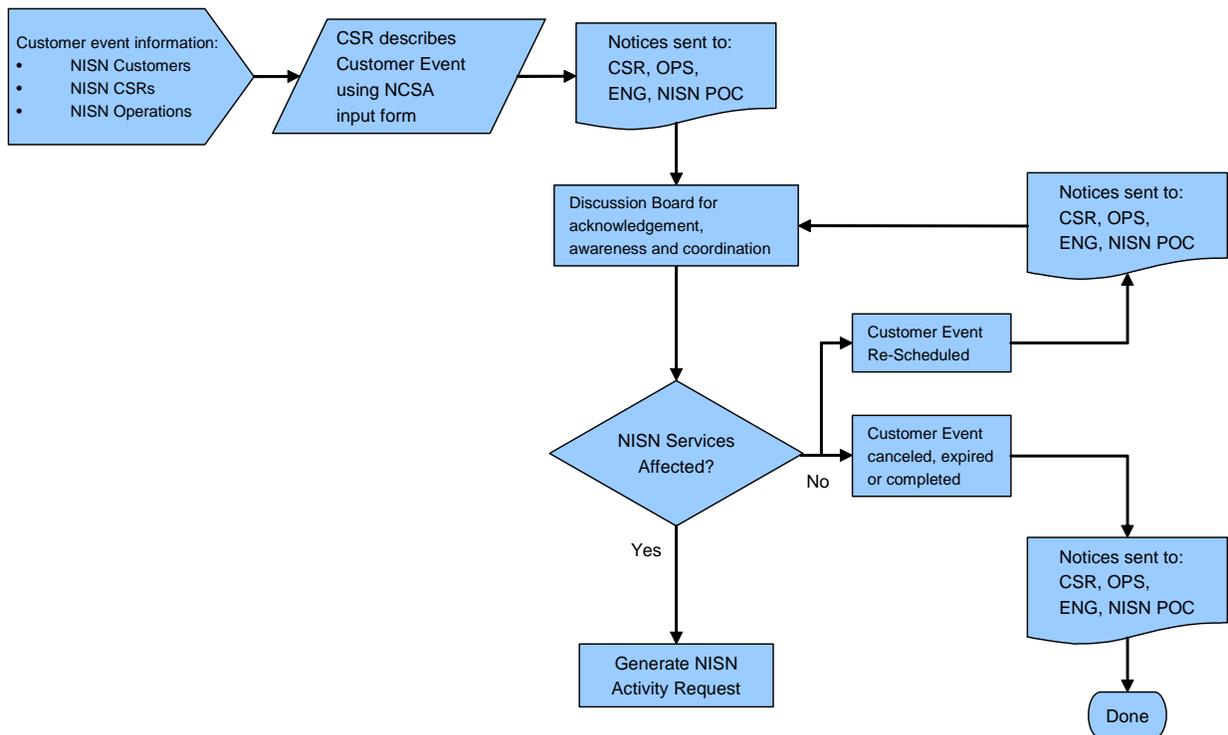


Figure 5. NCSA Workflow Diagram

9. NISN Operations Network Freeze Policy

The NISN Operations Network Freeze Policy establishes the procedures and individual responsibilities associated with both NISN Mission and Non-Mission communications network configuration freeze periods. Configuration freeze periods are imposed to minimize the risk of disruption to NASA communications services during high-priority or critical NASA spaceflight operations. Since configuration changes performed in support of maintenance or routine construction activities have the ability to adversely affect NISN communications services, it is necessary to closely assess and seek NISN management approval of any actions planned/requested during a NISN freeze period.

9.1 Scope

This policy applies to the following:

- a. NISN Hardware.
- b. NISN Software (network management systems and devices).
- c. Commercial Carrier services supporting NISN.
- d. NASA facilities that contain NISN services.
- e. NASA facilities that contain services that may affect NISN services (e.g., electrical power, heating/cooling and ventilation).

NISN communications network configuration freeze periods are in effect for NISN specific assets and other assets that may be either physically located near NISN assets or are, electrically or through other means, in a position to potentially affect NISN assets. This would include, for example, a freeze on performing under floor work or work within ceilings in rooms containing/supporting NISN assets.

9.2 Duration

The duration of a NISN operations network configuration freeze varies between the Mission and Mission Support networks depending on the associated NASA activity.

9.2.1 Mission Network

The following freeze durations apply to Mission network communications:

- a. **Space Shuttle.** A NISN Mission network freeze is in effect from five calendar days (120 hours) prior to launch until all playbacks are received at MILA after landing, which is four (4) hours for KSC landings and five calendar days (120 hours) for Dryden landings.
- b. **Soyuz/Progress and International Space Station (ISS).** A NISN Mission network freeze is in effect from eight (8) hours prior to Soyuz/Progress launch and ISS defined 'critical' activities until one (1) hour after the completion of the launch/activity. ISS critical activities may include, but not be limited to, Soyuz/Progress vehicle docking/undocking, ISS-based Extra Vehicular Activity (EVA), and critical ISS construction or maintenance/repair activities.
- c. **Expendable Launch Vehicle (ELV).** A NISN Mission network freeze is in effect from L-24 hours prior to launch until payload separation for mandatory Tracking and Data Satellite System (TDRSS) support launches which currently are defined as all Atlas and SeaLaunch supports. For all other ELV launches freeze period is in effect from L-4 hours or start of launch countdown until payload separation.

9.2.2 Mission Support (Non-Mission) Network

The following freeze durations apply to Mission Support network communications:

- a. **Space Shuttle.** A NISN Mission Support network freeze is in effect from one calendar day (24 hours) prior to launch until one (1) hour after landing.
- b. **Soyuz/Progress and International Space Station (ISS).** A NISN Mission Support network freeze is in effect from eight (8) hours prior to Soyuz/Progress launch and ISS defined 'critical' activities until one (1) hour after the completion of the launch/activity. ISS critical activities may include, but not be limited to, Soyuz/Progress vehicle docking/undocking, ISS-based Extra Vehicular Activity (EVA), and critical ISS construction or maintenance/repair activities.
- c. **Expendable Launch Vehicle (ELV).** NISN Mission Support communication services are not subject to routine network freeze constraint associated with ELV activities.

9.3 Critical Period/Event Support

For each NISN configuration freeze period, the timing and duration of any periods that have been defined by NISN as critical will be communicated to the major NISN support centers and primary commercial carrier service providers. Although waivers may be granted during a freeze period, NISN will not allow any freeze waivers to be granted permitting work during actual critical periods. Refer to Section 9.4, Notification. The duration of critical periods will be limited to the time of the actual activity. These periods include, but are not limited to the following: Space Shuttle launch, landing, and EVAs; Soyuz/Progress launch and dockings; ISS dockings and EVAs; ELV launch and payload separation; DSN critical periods such as planetary fly-bys, entries and landings; and other approved critical events.

Customers/projects requesting "Critical Event" notifications to the network and carriers for software uploading, simulations, etc. should submit their requests five days prior to the scheduled event to either the NNSG (for Mission services) or the ENMC (for Mission Support services). These organizations will create a notification message and distribute to the affected networks and carriers. While these events may not necessarily warrant a full "Communications Alert" or "Work Freeze" notification being issued, the respective Operations organizations will maintain a heightened sensitivity to these declared critical support events relative to scheduled maintenance and release requirements for associated circuits and services.

9.4 Notification

For each NISN freeze period a notification message will be distributed to all personnel known to be affected at least 48 hours prior to the defined freeze period start-time. This message will be sent by the NNSG and/or the ENMC and will include the following information:

- a. The freeze period start-and stop-time.
- b. Information on how to request a freeze waiver to accomplish necessary work on elements affected by the freeze.

- c. A defined Point of Contact (POC) for the particular NISN freeze. For Mission network freezes, the POC is defined as the NISN Mission Communications Manager (MCM) who is responsible for the NISN support to the activity defined by the freeze. For Mission Support (non-mission) network freezes, the POC is defined as the NISN Mission Support Operations Manager.

9.5 Waivers – Mission Services

To request that a waiver be granted to allow work to be performed on any mission network asset under a NISN freeze, the requester must submit a Freeze Exemption Request (FER) record for review and approval by NISN Operation Management.

9.5.1 FER Submission

FER record can be obtained electronically from the NNSG at (301) 286-5590. The FER record requires that personnel requesting a waiver describe the work to be performed, the location where the work will be performed, any known implications that the work may have on NISN assets supporting the NASA activity that the freeze is supporting, information on the impact if this work is not performed until the conclusion of the freeze period, a POC for the waiver request, and additional information that will allow NISN Management to assess the risk involved in approving the waiver. Instructions are included with the FER record to assist in determining what information is being requested. A FER can be submitted at any time during a freeze period or prior to the start of a freeze period if the requesting party is aware of work that may need to be performed during an upcoming freeze period. All efforts will be made to adhere to the standard NISN policy for scheduling mission activities 5 calendar days in advance.

9.5.2 FER Approval/Disapproval

Completed FER applications are returned to the NNSG who distributes the application to NISN management personnel responsible for reviewing/approving the requests. Support contractor Section Leads are responsible for reviewing and submitting their recommendation, while the following NISN representatives are responsible for reviewing and approving/disapproving the FER application:

- a. NISN Mission Operations Manager
- b. NISN Deputy Mission Operations Manager
- c. NISN Code 730 Division Management

Approval of a FER is only granted if individuals defined above concur that the FER should be approved. Although the FER evaluation/approval cycle may be completed sooner, requesting groups should be aware that all FERs will be dispositioned within 24 hours from the time a submission is received by the NNSG. If approved, the NNSG will send a copy of the approved FER to the submitting organization. This copy of the approved FER should be carried with the personnel performing the work as proof that the work has been authorized. Security personnel will not allow work to proceed on-site if this proof is not available. If the FER is not approved, the submitting organization will be notified and provided information on why the FER was denied. At this point they

may choose to resubmit the FER with additional information, if clarification is requested prior to approval, or to address the concerns expressed in the FER denial. Refer to Figure 6, Mission Freeze Exemption Process.

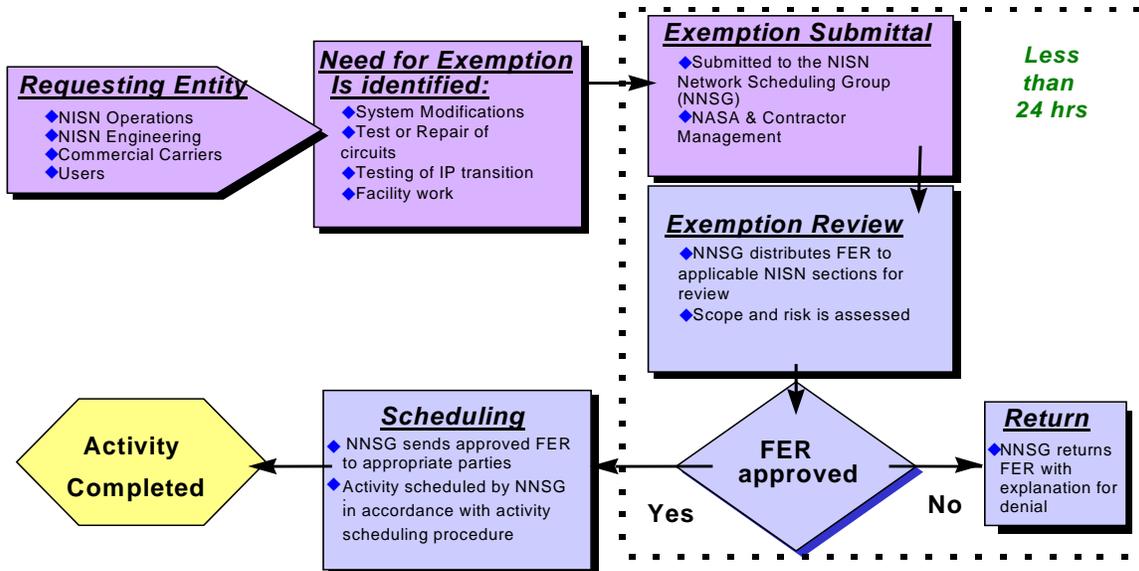


Figure 6. Mission Freeze Exemption Process

9.5.3 FER Implementation Process

If approved, the personnel performing the work are required to notify the COMMGR prior to the start of any work, and at the time that the work is completed. The COMMGR has the authority to ask that the work be delayed or cancelled if critical operations are being supported when the personnel arrive. In addition, if during the performance of the approved work, personnel identify any unforeseen hazards that have the potential to impact NISN Operations that are supporting the activity that necessitated the freeze, the personnel should cease work immediately and notify the COMMGR that the work has been stopped. The COMMGR should also be briefed on the unforeseen hazards that were encountered, the status of the work at the time the work was stopped, and any risks involved in leaving the work partially completed.

9.6 Waivers – Mission Support Services

To request that a waiver be granted to allow work to be performed on any non-mission network asset under a NISN freeze, the requester must submit a Written Request record for review and approval by NISN Operation Management.

9.6.1 Waiver Submission

The Written Request record requires that personnel requesting a waiver describe the work to be performed, expected duration, the location where the work will be performed, any known implications that the work may have on NISN assets supporting the NASA activity that the freeze is supporting, information on the impact if this work is not

performed until the conclusion of the freeze period, a POC for the waiver request, back out plan, and additional information that will allow NISN Management to assess the risk involved in approving the waiver. A Waiver Request can be submitted at any time during a freeze period or prior to the start of a freeze period if the requesting party is aware of work that may need to be performed during an upcoming freeze period. All efforts will be made to adhere to the standard NISN policy for scheduling mission support activities 10 calendar days in advance.

9.6.2 Waiver Approval/Disapproval

Only the NISN Mission Support Operations Manager is responsible for reviewing/approving waiver requests. Although the waiver evaluation/approval cycle may be completed sooner, requesting groups should be aware that this approval cycle is defined as requiring up to 24 hours to complete from the time a submission is received by the NISN Mission Support Operations Manager. Requestors need to factor in time to accomplish any mobilization/logistics/staffing required to complete the activity. If approved, the NISN Mission Support Operations Manager will send a copy of the approved waiver to the submitting organization. If the waiver is not approved, the submitting organization will be notified and provided information on why the waiver was denied. At this point they may choose to resubmit the waiver with additional information, if clarification is requested prior to approval, or to address the concerns expressed in the waiver denial.

9.6.3 Waiver Implementation Process

If approved, the personnel performing the work are required to notify the NISN Mission Support Operations Manager prior to the start of any work, and at the time that the work is completed. The NISN Mission Support Operations Manager has the authority to ask that the work be delayed and/or cancelled if critical operations are being supported when the personnel arrive. In addition, if during the performance of the approved work, personnel identify any unforeseen hazards that have the potential to impact NISN Operations that are supporting the activity that necessitated the freeze, then the personnel should cease work immediately and notify the NISN Mission Support Operations Manager that the work has been stopped. The NISN Mission Support Operations Manager should also be briefed on the unforeseen hazards that were encountered, the status of the work at the time the work was stopped, and any risks involved in leaving the work partially completed.

9.7 Emergency/Make Operable Repairs

If emergency repairs are required during a freeze period, a FER/Waiver Request is not required to begin work. Prior to beginning the work, personnel who will be performing the work should notify the COMMGR or NISN Mission Support Operations Manager as appropriate of the nature of the emergency or make operable situation, the impact on operations, the work that will be performed, expected duration, any risks to operations associated with the work, the location where the work will be performed, a back out plan, and an estimate of when the work will be completed. Depending on the risks associated with the work and the criticality of ongoing operations, the COMMGR or

NISN Mission Support Operations Manager as appropriate will be responsible for approving/disapproving the work or defining the timeframe when the work can be safely accomplished. When the work is completed or if problems are encountered in the performance of the work, the COMMGR or NISN Mission Support Operations Manager should again be notified. Under these special circumstances, customer scheduling and notification for make operable activities will be on a best effort basis. Throughout the above process, the COMMGR is subsequently responsible for notifying the NISN Mission Operations Manager as appropriate.

9.8 Freeze Policy Information/Questions

To request a FER or to obtain answers on how to fill out the FER record, the NNSG should be contacted at 301-286-5590. For general information on the Mission network freeze policy, the NISN Mission Operations Manager at 301-286-6205, or the UNITEs Mission Operations Manager at 301-286-6486 should be contacted. Similarly, general information pertaining to the Mission Support network freeze policy can be obtained by contacting the NISN Mission Support Operations Manager at 256-544-2285, or the UNITEs Operations Manager at 256-544-2737.

10. NISN Major Outage Notification

From time to time, one or more NISN services or major network components are disrupted because of equipment or support system failures, human error, or natural hazards. When any of these type disruptions occur, NISN will notify affected customers as quickly as possible and, as appropriate, provide customers with periodic status updates during the trouble isolation and service restoration process.

10.1 Major Outage Notification Process

A Network Outage is defined as any unplanned, temporary interruption of service. Outages are categorized based on the degree of impact potential and criticality of affected services. Those outages with the greatest impact potential or affecting highly critical services, and with a duration that exceeds a specified interval, are defined as Major Outages and are summarized in this section. In the case of a major outage, special steps are taken to immediately notify and provide periodic status to appropriate customers/locations. Predetermined information concerning the outage will be disseminated based on criteria defined below.

A Major Outage Notification will be issued when a failure occurs in either the mission or non-mission networks and affects primary transmission systems for a duration exceeding 5 minutes. This 5-minute service outage time interval pertains only to the broadcasting of a Major Outage Notification. A Priority 1 TT will be immediately opened and investigated regardless of the duration of the outage and regardless of whether or not a Major Outage Notification is issued.

Major Outage Notifications use a common format and are issued when the Major Outage occurs, and periodic update notices are issued as appropriate to keep users informed of restoration status. Service Restoration notices are issued when service is restored, and Final Reason for Outage (RFO) notices are issued to inform customers if

this information was not available at the time the Service Restoration notice was issued. The ENMC and COMMGR maintain lists of services impacted by circuit ID and/or network device.

Major Outage Notifications are made using AOPNS and MONS. AOPNS and MONS are web-based notification systems that allow NISN Management and NISN customers to subscribe to all or a subset of the published Major Outage Notices. The subscriber can define key words or a key phrase of interest such that only notices containing one or more of the key words or the entire key phrase will be sent to them.

Some of the key points regarding Major Outage Notification are listed below:

- a. Outage notification will use the AOPNS/MONS.
- b. The COMMGR and ENMC function in a backup capacity for each other when issuing outage notifications.
- c. Using pre-defined criteria, the ENMC or COMMGR will determine if an outage is to be classified as major. Refer to Section 10.2, Major Outage.
- d. For all Major Outages, customers will receive a standard notification.
- e. Internal technical and management escalation processes are maintained for specific NISN services, including use of a Flash Report process.
- f. Specific customer sets may receive personal notification.

For all Major Outages, customers that subscribe to AOPNS/MONS will receive a standard notification. The process for outage notification is shown in Figure 7, Outage Notification Process. An example of an outage notification is shown in Figure 8, Major Outage Notification Example.

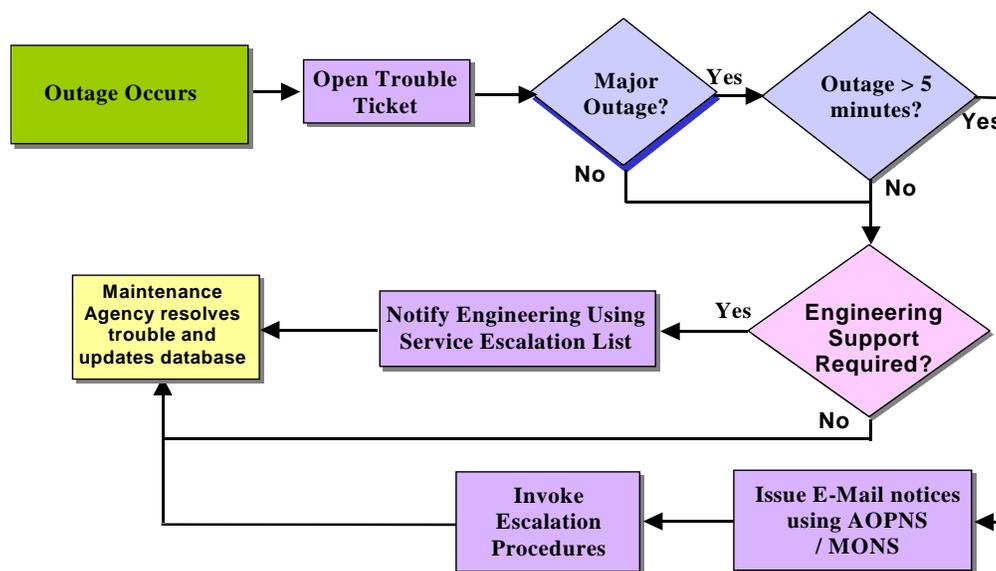


Figure 7. Outage Notification Process

TT: 538491 -- MAJOR OUTAGE AND RESTORAL -- Major Outage	
Notice Date: Mon Dec 5 09:22:45 CST 2005	
TIME DOWN:	12/05/2005 08:36 CST (12/05/2005 14:36 GMT)
TIME UP:	12/05/2005 08:39 CST (12/05/2005 14:39 GMT)
SITES AFFECTED:	JSC
SERVICES AFFECTED:	All JSC NDC user traffic.
STATUS / REASON for OUTAGE:	Electrical power outage. ENMC investigating.
TROUBLE TICKET:	538491

Figure 8. Major Outage Notification Example

10.2 Major Outage

10.2.1 Mission Services

A Mission Major Outage is defined as any outage to a mission service that is scheduled for support and/or is not restored in a timely manner. The COMMGR is responsible for contacting the project/program customer to determine if there are impacts to mission support. The COMMGR will issue a Major Outage Notification when a failure occurs in the Mission Network and affects primary transmission systems, including the following:

- a. Major power failures.
- b. AT&T network management system.
- c. RAD channel banks.
- d. Multi-Protocol Label Switching (MPLS) equipment.
- e. Internet Protocol Operations Network (IONet) routers and conversion devices.
- f. Time Division Multiplexing (TDM) equipment.
- g. Backbone circuits.
- h. Mission dedicated voice - Voice Distribution System (VDS) and Voice Switching System (VSS).
- i. Mission video.
- j. Other significant interruptions of service as deemed appropriate.

The COMMGR is responsible for managing the commercial carriers that provide transmission services to NISN. The COMMGR will perform carrier escalations, as deemed necessary, on a case-by-case basis. In general, the COMMGR will consider carrier escalation every hour during major outages, however, the COMMGR will exercise judgment when effecting carrier escalations so that the request for escalation is meaningful and productive.

10.2.2 Non-mission Services

ENMC personnel will issue a Major Outage Notification when a failure occurs in the Mission Support (i.e. non-mission) Network and affects primary transmission systems, including the following.

- a. Major power failure.
- b. Integrated Digital Network Exchange (IDNX) multiplexers.
- c. Internet peering points.
- d. Backbone circuits.
- e. Optical Network Switching (ONS) equipment.
- f. Multi-Protocol Label Switching (MPLS) equipment.
- g. Time Division Multiplexing (TDM) equipment.
- h. PIP and SIP core routers/switches including peering routers.
- i. Full service Video Teleconferencing System (ViTS) rooms.
- j. Federal Telecommunications System (FTS) switched voice.
- k. DCNSS elements.
- l. Other significant interruptions of service as deemed appropriate.

10.3 Minor Outage

Any equipment or service that does not meet the definition or criteria of a major outage is, by default, a Minor Outage. An example of a Minor Outage is service impairment to a single user, such as a tail circuit. Notifications are not broadcast for this level of outage.

Appendix A. Abbreviations and Acronyms

Acronym	Definition
ADP	Automated Data Processing
AOPNS	Activity and Outage Notification System
ARC	Ames Research Center
ATM	Asynchronous Transfer Mode
BPX	Broadband Packet Exchange
CBR	Constant Bit Rate
CCCM	Center Customer Commitment Manager
CD	Conversion Device
CDMGR	Conversion Device Manager
Cell	Cellular
CIEF	Carrier Independent Exchange Facility
COMMGR	Communications Manager
CSO	Computer Security Official
CSR	Customer Service Representative
CST	Central Standard Time
CVPN	Corporate Virtual Private Network
DCN	Document Change Notice
DCNSS	Data Center Network & Security Services
DNS	Domain Name Service
ELV	Expendable Launch Vehicle
e-mail	Electronic Mail
ENMC	Enterprise Network Support Center
EVA	Extra Vehicular Activity
Fax	Facsimile
FER	Freeze Exemption Request
FTS	Federal Telecommunications System
GCC	Goddard Comm Control
GMT	Greenwich Mean Time
GSFC	Goddard Space Flight Center

Acronym	Definition
GTWY	Gateway
ID	Identification
ID/IR	Intrusion Detection/Incident Response
IDNX	Integrated Digital Network Exchange
IEM	Integrated Enterprise Management
IONet	Internet Protocol Operational Network
IP	Internet Protocol
IPNOC	Internet Protocol Network Operations Center
ISD	Information Services Department
ISS	International Space Station
ITSM	IT Security Manager
JSC	Johnson Space Center
JSC-TSC	Johnson Space Center – Telescience Support Center
KSC	Kennedy Space Center
L2VPN	Layer 2 Virtual Private Network
LAN	Local Area Network
LBV	Low Bandwidth Video
MCM	Mission Communications Manager
MGX	Multi-Service Gateway Exchange
MONS	Mission Outage Notification System
MPLS	Multi-Protocol Label Switching
MSFC	Marshall Space Flight Center
NACC	NASA Automated Data Processing (ADP) Computer Center
NASA	National Aeronautics and Space Administration
NASCOM	NASA Communications
NCSA	NISN Customer Scheduling Awareness
NISC	NASA Information Support Center
NISN	NASA Integrated Services Network
NNSG	NISN Network Scheduling Group
NOMAD	NASA Operational Messaging and Directory
NOMC	NASCOM Operations Management Center

Acronym	Definition
NSOC	NISN Security Operations Center
NSR	NISN Service Request
OC	Optical Carrier
OLA	Operating Level Agreement
ONS	Optical Network Switching
OPR	Officer of Primary Responsibility
PIP	Premium Internet Protocol
PM	Preventive Maintenance
POC	Point of Contact
RFO	Reason For Outage
SCD	Small Conversion Device
SIP	Standard Internet Protocol
TCP	Transmission Control Protocol
TDM	Time Division Multiplexing
TDRSS	Tracking and Data Relay Satellite System
TT	Trouble Ticket
UDP	User Datagram Protocol
VBS	Video Bridging Service
VDS	Voice Distribution System
ViTS	Video Teleconferencing System
VoTS	Voice Teleconferencing System
VPN	Virtual Private Network
VRA	Video Rollabout
VSS	Voice Switching System
VTC	Video Teleconferencing Center
WAN	Wide Area Network