Disaster Recovery Plan

Procedures for disaster recovery planning and execution activities;
Hughes has designed the network to obtain 99.7% network availability. However, Hughes recognizes that outages will occur. How recovery is accomplished depends on the type of failure.

Recovery of Remote Site Failure
An outage at a remote location can be due to two primary factors. The first is a hardware failure that makes the remote CPE inoperable. In this situation, the Hughes Help Desk will dispatch a field service technician to correct the failure and restore service.

The other type of situation that can develop is where the remote CPE is working but cannot establish a link with the Hughes Network Operating Center. This can occur due to a very heavy rain or ice creating interference and reducing the signal strength or due to a failure of the radio on the antenna. The system is designed to provide 99.7% availability with taking these outages into consideration. To improve the availability and recovery from this type of failure, the indoor unit supports a terrestrial connection for redundancy. This feature is called Virtual Automatic Dial Backup (VADB) because it utilizes a dial-up VPN connection.

Recovery of Satellite Transponder Failure
When a signal is sent to a satellite for transmission, the main element involved in receiving the signal and amplifying it for return transmission to Earth is called the transponder. The main component of a transponder is the travelling wave tube amplifier (TWTA), The TWTAs have redundancy in a ring switching arrangement. This ring switching allows failures to be recovered by issuing of commands which replace a failed TWTA with a functional spare TWTA. The timeframe to recover from a TWTA failure is typically in the 5-45 minute range. All components on the satellite

Recovery of Satellite Failure
Communications satellites are designed for the utmost in reliability. Spare components are used in every system of the satellite and each system is closely tracked and monitored every second of every day. HUGHES has satellite capacity on many satellites across the North America arc so repointing sites is available to HUGHES more than any other supplier in the industry. HUGHES also engages in proactive health analysis of our satellites so we understand the health and risk at all times.

Hughes has developed a Network Disaster Recovery Operating Procedure (NDROP) as its plan for responding to a satellite failure. In this plan, Hughes has identified the Customers and associated remote locations that would be impacted by the in-orbit failure of a satellite. This document provides detailed procedures to be followed in the event of an unrecoverable satellite failure, and for the purpose of restoring the affected communication networks to service as soon as possible.

The NDROP plan provides detailed descriptions of the declaration and notification process. A crisis management plan is delineated and lists the role and interaction for each functional group including the call center, operations, engineering, emergency response center, and program management. Also included is a description of first-, second-, and third-level field resources.

After a satellite failure is declared, Hughes will mobilize a set of functional teams. These teams will coordinate internally, and with Customer personnel, to reestablish network connectivity at each remote site. Clearly, the most critical element of this process relates to repointing of VSAT systems to an operational satellite with defined frequencies and support configurations. Hughes has at its disposal three levels of repoint resources, which can be quickly and efficiently deployed. These include personnel that typically handle Hughes installations and those that provide field service to Hughes Customers.

The repoint process is managed from a geographical perspective, with an assigned program and technical manager for each region. Resources, which have been pre-identified in each region, are deployed using the NDROP database. Priorities for repoint activity are driven by geographical proximity, that is, repoint crews identify those sites which they can arrive at most quickly.

Recovery of Hub Failure

Hughes operates three major NOCs in Germantown, MD, Las Vegas, NV, and Detroit, MI. Critical electronic NOC components are equipped with redundancy in order to maintain the necessary level of availability. The entire operations activity is maintained in a secured facility with battery backup and diesel generators that are capable of supporting 150% of the building's power requirements for up to a week with the current fuel load. Backup power systems are routinely verified and utilized during maintenance windows to ensure that the systems are operational. Delivery schedules for additional diesel fuel have been arranged so that it can be delivered at preset times in the event the generators are required. Satellite uplink RFTs are distributed around the campuses and are connected via a fiber ring that allows for the switching of traffic. Considerable expense has been made to ensure the reliability and redundancy of the campus environment.

The traffic carrying NOC components will automatically switch in a redundant element in the event of a failure. An alarm message is generated to the NOC operator. The operator examines the failure state and determines if the shelf spare needs to be immediately installed. Most elements can be hot swapped so that there is no interruption in traffic. For those elements that cannot be automatically switched in, there are shelf spares preconfigured and ready to be installed in the event of a problem.

For an incremental charge, Hughes can work with a Customer to develop a Customer-specific Disaster Recovery plan and set aside dedicated equipment at an alternate Hughes facility to support a faster recovery in the event of a disaster. In the event it is determined by a Customer that this type of a disaster recovery network is required, Hughes will work closely with them to develop plans for Disaster Recovery (DR) and/or Business Continuity Management (BCM) arrangements for the data network.