

The background of the image is a server room. It features several server racks with a blue tint. The racks are filled with various components, including what appears to be network switches and server units. Some of the units have small blue lights illuminated. The overall atmosphere is technical and modern.

US SIGNAL DISASTER RECOVERY MANUAL

v. for release

Disaster Recovery Procedure

Purpose: These procedures are intended to describe the base processes utilized by US Signal in a Disaster Recovery Event. They include determination, communication, process flows and necessary sub-procedures. This Manual is not all inclusive of every event that may occur, nor is it intended to take the place of steps considered commercially reasonable during an event or hinder time sensitive reaction and decision making processes.

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1. Determining a Disaster Recovery (DR) Event

A DR Event will normally be classified as anything above a standard Network Event (NE) or Major Service Interruption (MSI) notification. This would include a complete site loss, an entire loss of site power to a US Signal owned facility or any other catastrophic event that would be an obvious escalation in severity.

Although a seemingly obvious DR Event could be determined by the NOC Surveillance team; this classification will normally be determined by the consortium of individuals present on an MSI bridge and under direction from US Signal's Executive Management.

If a DR Event is declared, proceed with the following steps.

2. Bridge activation and assignment

The following bridges will need to be immediately opened following the declaration of the DR Event.

1. Primary Bridge:

This bridge will be assigned for communication and coordination between the NOC, Engineering, Operations and Executive Management. Progress and status updates will be provided on this bridge.

2. Technical Bridge:

Logistic (Field Operations) and Engineering coordination will reside on this bridge.

3. Sales Team Bridge:

This bridge will provide updates for the Sales department so they may effectively communicate the failure scenario and restoration progress to their customers.

3. DR Alert notification & paging

A DR Event text is sent and a DR sales distribution email list is used to communicate with the respective parties involved with the DR Event.

4. Determine the DR Director

Members of the DR Primary Bridge will utilize the following list to appoint both a DR Director and a Sales Team Liaison. Once determined, the DR Director will have full responsibility for managing the event and will also provide updates to the Executive Management. The Sales Liaison will be responsible for managing the Sales Team Bridge and providing updates to their organization.

1. If the DR Event is "Network" related, the DR Director will be:

- Primary
 - Director of Network Operations
- Secondary
 - Director of Engineering
- Tertiary
 - Director of IT/IS

4. Determine the DR Director (cont'd)

2. If the DR Event is “Enterprise” related, the DR Director will be:

- Primary
 - Director of IT/IS
- Secondary
 - Director of Operations
- Tertiary
 - Director of Engineering

3. If the DR Event is “Cloud” related, the DR Director will be:

- Primary
 - Director of Network Operations
- Secondary
 - Director of Cloud Engineering
- Tertiary
 - Director of EVP of Operations

4. The Sales Team Liaison will be selected from the following list:

- Primary: VP of Marketing & Product Development
- Secondary: Director of Client Development

5. Activation of the initial phone system message

Upon completion of Step 4, the NOC Manager will activate the emergency phone system message. Timing and content of subsequent updates will be provided by the DR Director.

The NOC Manager will utilize the US Signal phone message setup procedure to configure an initial announcement explaining that US Signal is aware and responding to an active DR Event.

6. Determine network and customer impact

The DR Director along with Cloud Engineering, Information Technology, Operations, and NOC staff will determine the initial impact to the US Signal Network and its customer base. This information will be used to compose a summary and notification to its customers and Executive Management.

An assessment of the situation will occur to determine the scope of the impact. It will include a the following:

1. Asset loss:

- Fiber assets
- Equipment loss
- Site infrastructure loss
 - Power
 - HVAC
 - Building

2. Service outages:

- Customers reporting
- Customers serviced off the affected equipment

7. Determine equipment lost or at jeopardy

As a continuation of Step 5, begin to compile a device level inventory of equipment, network and services that are known or suspected to be affected by the DR Event. The intent is to complete Step 7 with an all encompassing list of equipment and materials that may be affected by the DR Event so US Signal may plan for replacement or repair of such assets in Step 8.

8. Determine necessary replacement equipment and materials from DR inventory or maintenance spare stock

Due to the variety of possible failed components and network infrastructure, Engineering will analyze the failed equipment list in Step 7 to determine the most efficient way to restore services. Engineering will then compare the failed gear with the DR inventory and maintenance spare stock in US Signal's inventory system and quickly build a list of the components necessary to pull from inventory.

In the event that the inventory system is inaccessible, engineers will refer to the backup copy of the inventory database maintained in the NOC.

9. Dispatch technicians and equipment

The Field Operations Manager is responsible for logistical and dispatch support/coordination during a DR Event. The DR Director will provide a list of necessary replacement components to the Field Operations Manager so that the appropriate Field Technician can pull stock and assist the affected location.

10. Update the phone system message and activate the DR website

1. NOC Manager with guidance by the DR Director will determine an updated message to include initial scope of failure and technician estimated time of arrival to the affected location.
2. The NOC Manager will update the phone system message and initiate option 1:
 - Update the initial emergency phone message with "Emergency Prompt Message 2".
 - Initiate Phone System Option 1 "Prompt Procedure" to provide additional information to customers.
3. The NOC Manager will complete the DR website setup procedure to initiate the US Signal DR website.

The US Signal DR website is used as an alternate method for providing customer updates on the current Network DR Event.

11. On-site damage survey and reporting

1. As the environment allows and in adherence to all site and equipment specific safety procedures, technicians on site will confirm inventory of lost:
 - Equipment
 - Infrastructure
 - Power
 - Cabling
2. The technician will relay this information to the Technical Bridge.

12. Begin site/equipment replacement, install and recovery

With direction from US Signal's Engineers, begin site/equipment replacement as necessary utilizing the equipment specific guides to accomplish the respective failure level restoral.

13. Network restoral

Upon completion of step 12, Engineers, Operations and NOC will check the following items for proper operation to determine if further testing or recovery actions are necessary. Upon clarification of an "Operations Normal" state, the NOC will utilize step 3 to transmit a termination of the DR Event.

1. Optical levels
2. Performance monitoring
3. System and Server Operation
4. Network alarming
5. Customer availability
6. Customer reports

14. Post event analysis

1. Situational assessment to determine necessary action items to return network to prior state
2. Event assessment
3. Application of Post Mortem Analysis to existing processes and procedures
4. Change processes & procedures as warranted

15. DR Inspection Test (DRIT) scheduling and requirements

1. A DRIT will be scheduled and completed at least annually for Cloud, Network and Enterprise DR plans.
2. A DRIT Scenario will be established by the Information Security Officer to determine the scope of the drill and test scenario.
3. DRIT Director will appoint both a DR Field inspector and DR NOC inspector to take annotation and critique the test.
4. Resources will be scheduled 3 weeks prior to the event to assure availability and normal network operation and support.
5. Implementation of the following components and topologies must be incorporated into each DRIT:

Network

- Meshed DWDM Network
- UPSR Sonet Network utilizing DWDM as transport
- Routed & switched network components
- Ethernet over SONET
- DCS integration to prove DS1 layer muxing capability
- DR trailer environment to include:
 - Infrastructure
 - Power
 - Fiber

Cloud:

- Storage components
- Server components
- Hypervisor
- Networking

Enterprise:

- Storage components
- Server components
- Hypervisor
- Critical business systems
- Networking
- Phone System

15. DR Inspection Test (DRIT) scheduling and requirements (cont'd)

6. The DRIT will begin upon the discretion of the DRIT Director and the standard DR process will be followed in accordance with the scope and scenario decided upon in Step 2. All steps, communications and conversations will be prefaced with “SIMULATED” to correctly identify the DRIT as a test situation.

7. The DRIT Director will terminate the scenario once it is verified that all tests have been satisfied. The following steps will be taken after completion of the successful DRIT:

- DRIT setup decommissioning
- Post DRIT equipment inventory
- Inspector report compilation
- Scheduling of review

16. DRIT results, findings, failures and evaluation reports

1. The DRIT team will discuss the test.

2. Review inspectors analysis and findings

3. Compile an advisory list to include:

- Failures, obstacles, necessities
- Positive operations, enhancements, efficiencies

4. Determine the following:

- steps that need to be added, altered or deleted
- equipment configuration changes
- equipment necessities

5. All DRIT results, findings, failures and evaluations reports will be compiled into a DRIT post analysis report.

17. DR process revision history

The DR process revision history log provides a reference of past procedure revisions, a synopsis of the respective modifications and a link to any DRIT post analysis reports that prompted revisions.

The revision history log will be updated each time a DRIT is completed.