Low battery, loss of program and unprogrammed cautions are used to remind the user of actions that are required. Any meter with a low battery caution may lose time if the battery is not replaced before the next power outage.

Other caution codes report unusual operation such as receiving energy from the load, leading power factor, very high current flow, or low voltage.

TIP: *When multiple cautions occur they are combined. For example, CA040400 indicates leading quadergy and low potential.*

3.13.2.1 CA 000001—Low Battery

The Low Battery caution indicates a weak or missing battery. The meter periodically tests the battery. The meter sets the Low Battery caution if the battery voltage is low. The Low Battery caution is cleared when the battery test passes. The meter tests the battery under the following conditions:

- Power up
- 1st of each month (00:16)
- Activation of the Display Switch (not in Test Mode)
- MeterMate™ Meter Communication command

3.13.2.2 CA 000010—Unprogrammed

The Unprogrammed caution indicates that the meter is not programmed and is functioning in a default demand mode. The meter is shipped unprogrammed unless it is ordered factory-programmed. The MeterMate™ Meter Communications Unprogram command will put the meter into the Default Demand mode and set the Unprogrammed caution. Programming the meter clears the Unprogrammed caution.

3.13.2.3 CA 000040—Loss of Program

The Loss of Program caution indicates that a programming session was interrupted. The meter sets the Loss of Program caution when a programming session is terminated abnormally. The meter will roll back to the last good program and operate from it. If a meter has a Loss of Program caution, reprogram the meter and the Loss of Program caution will be cleared.

3.13.2.4 CA 000050—Unprogrammed and Loss of Program

The Unprogrammed and Loss of Program caution indicates that a programming session was interrupted while the meter was operating in default demand mode. The meter sets the Loss of Program caution when a programming session is terminated abnormally. The meter will roll back to the default demand program and operate from it. If a meter has an Unprogrammed and Loss of Program caution, reprogram the meter and the Unprogrammed and Loss of Program caution will be cleared.

3.13.2.5 CA 000100—DC Detected

The DC Detected caution indicates the presence of DC in the current signal. The meter checks for the presence of DC every second; if it detects the presence of DC for longer than the factory configured duration, the meter sets the DC Detected caution. The meter does not automatically clear the DC Detected caution. The DC Detected caution is cleared by a demand reset.

3.13.2.6 CA 000400—Low Potential

The Low Potential caution indicates that measured voltage falls below the programmed tolerance. The voltage is tested every five seconds using the voltage from the previous second. The meter sets the Low Potential caution when the test fails three consecutive times. The meter automatically clears the Low Potential caution when all active phases exceed the minimum threshold for two consecutive tests.

3.13.2.7 CA 000500—DC Detected and Low Potential

The DC Detected and Low Potential caution indicates that measured voltage fell below the programmed tolerance and the presence of DC in the current signal has been detected.

3.13.2.8 CA 004000—Demand Overload

The Demand Overload caution indicates that the kW demand exceeded the programmed threshold. The meter compares the value of the instantaneous kW demand quantity to the programmed threshold every five seconds using the demand from the previous second. The meter sets the Demand Overload caution when the kW demand exceeds its threshold for 3 consecutive tests. The meter does not automatically clear the Demand Overload caution. The Demand Overload caution is cleared by a demand reset.

3.13.2.9 CA 040000—Leading kvarh

The Leading kvarh caution indicates that the current leads the voltage instead of lagging it. The meter tests the direction of the quadergy every five seconds using the kvarh from the previous second. The meter sets the Leading kvarh caution when the direction of the quadergy is leading for three consecutive tests. The meter does not automatically clear the Leading kvarh caution. The Leading kvarh caution is cleared by a demand reset.

3.13.2.10 CA 400000—Received kWh

The Received kWh caution indicates that active energy was received from the load. The meter tests the direction of the active energy every five seconds using the kWh from the previous second. The meter sets the Received kWh caution when the direction of the active energy is received for three consecutive tests. The meter does not automatically clear the Received kWh caution. The Received kWh caution is cleared by a demand reset.

Table 3-5 Fault Symptoms Without Codes

Symptom	Probable Cause	Remedy
High/low demand registration	a. Socket wiring error. b. Meter internal wiring defective. c. Defective sensor.	a. Rewire according to applicable diagram. b. Check that voltage and current connectors are seated properly. Check the leads for damage. c. Replace meter.
Meter overheats	a. Meter socket has insufficient capacity or is not adequately wired. b. Meter is overloaded. c. Poor connection at socket terminal.	a. Replace mounting with a heavy duty model. b. Use transformer rated installation. c. Replace socket terminal.
Meter runs slow	a. Socket wiring error. b. Meter internal wiring defective. c. Defective sensor.	a. Rewire according to applicable diagram. b. Check that voltage and current connectors are seated properly. Check the leads for damage. c. Replace meter.
No display	a. Circuit de-energized b. Test link(s) open. c. Meter internal wiring defective.	a. Check circuit voltages. b. Close test links. c. Check that the voltage and current sensors are properly connected. Also check the wires for damage.

4. Upgrading

4.1 General

The GE I-210+c™ meter contains *lethal voltages*. The meter must be completely disconnected from any external circuits before disassembly is attempted. Failure to observe this practice can result in serious injury or death.

Refer to the MeterMate software manuals (GEH-5082O, GEH-5084O) for instructions on how to install and enable software options.

4.2 Soft-switches

The basic I210+c™ meter provides a powerful platform for advanced metering. Features may be added to the basic meter through soft-switches, which enable built-in capabilities. Soft-switches may be ordered at the time the meter is purchased, or added in the field. Soft-switches may be removed from one meter and installed in another meter.

The following table lists the soft-switches available in the I210+c™:

Table 4-1 I210 Demand/TOU Soft-switches

Switch	Description
A2	Alternate Communication
E2	Event Log
K2	kvar and kVA measures
N2	Billing Demand
Q2	Voltage Measures
R2	Load Profile Recording (two channels)
T2	Time-of-use

4.2.1 Alternate Communication—A2 Soft-switch

The Alternate Communication Soft-switch allows a communication option board to communicate with the meter.

4.2.2 Event Log—E2 Soft-switch

The Event Log Soft-switch allows the meter to track the most recent 200 events. Use MeterMate™ Program Manager, Diagnostics Editor, to select the event types to be logged and how many occurrences should be tracked, up to a maximum of 200 events. Date and time stamps are included on logged events for Demand/LP or TOU meters. Logged events include:

- Cautions: Low potential, demand overload, leading kvarh, reverse energy flow, DC detection (set and clear events);

- Real-time pricing activation and deactivation;
- Test mode activation and deactivation;
- Externally initiated meter reading (local or remote);
- Programming sessions;
- Power up, power down;
- Demand resets;
- Self-reads.

4.2.3 kVA and kvar Measurements—K2 Soft-switch

The kVA and kvar Soft-switch adds kVA(h) and kvar(h) measurement capability.

- The K2 Soft-switch enables the following configurations for varh measurements.
  - Fundamental plus harmonics varh lagging only
  - Fundamental plus harmonics varh leading only
  - Fundamental plus harmonics varh |lagging| - |leading|
  - Fundamental plus harmonics varh |lagging| + |leading|
- The K2 Soft-switch enables Fundamental plus harmonics Phasor Apparent VAh measurement.

The I210+c™ meter can have up to two quantities defined in the measurement profile, with each of these being used for summations and demands.

4.2.4 Demand—N2 Soft-switch

The Demand (N2) Soft-switch adds billing demand calculations. If the N2 switch is not present, the meter will not calculate billing demands and will set demands to 0 (zero). The meter will always calculate non-billing demands for cautions.

4.2.5 Power Quality Measurements—Q2 Soft-switch

The Power Quality Measurements Soft-switch enables the following:

- Voltage (L-N): VA (max, min, store) for summations, demand, and load profile recording;
- RMS voltage measurement for reading and display;
- Low potential caution.

4.2.6 Basic Recording—R2 Soft-switch

The Basic Recording Soft-switch enables up to two channels of load profile recording. The number of active channels and days of load profile data are configurable using the MeterMate Program Manager Recorder Option editor.

4.2.7 Time Of Use—T2 Soft-switch

The Time-of-use Soft-switch enables TOU operation. The meter supports:

- Up to four TOU periods and four Seasons
- Up to three daily rate schedule types and one holiday schedule
- Up to 80 TOU schedule set points
- Up to 50 programmable dates:
  - Holidays, season changes, Daylight Savings Time (DST), self-read, demand reset
  - Perpetual calendar handles most dates
- Up to two billing and two demand measures per TOU period
- Self-read actions on specified dates, with or without a demand reset

4.3 Converting from Demand to Demand/LP or TOU Mode

The I210+c™ is four meters in one: demand, demand/load profile, TOU and TOU/load profile. The load profile recording and time-of-use options require soft-switches to extend the functionality of the basic demand meter.

The following items are required to enable demand/LP, TOU or TOU/LP operation:

- Computer with MeterMate™ software;
- Soft-switch holder with T2, and R2 switches
- SMARTCOUPLER™ device
- Timekeeping battery or super capacitor

If at any time you are unsure if the meter has been upgraded, select Check Meter on the MeterMate™ Upgrade menu. The screen will display the capabilities of the meter. To enable the TOU function, proceed as follows:

CAUTION: *Battery installation must be done with NO power applied to the meter.*

1. Plug the soft-switch holder into the parallel port or USB port of the computer.
2. Install and connect the battery. See section 0, Battery Replacement.
3. Apply power to the meter.
4. Connect the SMARTCOUPLER™ device to the serial port of the computer and the optical port on the I210+c™ Meter.
5. Using MeterMate™ Meter Comm software, go to the menu bar.
6. On the menu bar, select Upgrade.
7. On the Upgrade menu, select TOU.
8. This enables the TOU function in the meter. When the upgrade has completed, MeterMate™ returns to the Upgrade menu.
9. Mark the TOU box on the nameplate.
10. Repeat steps 8 through 10 for the Basic Recording, R2 Soft-switch.

TIP: *If you are not ready to install the TOU program, the meter may still be used as a Demand meter after the TOU switch is enabled. The battery may be put in place in the battery holder, but must not be connected until the meter has been programmed for TOU operation.*

4.4 Meter Disassembly

The GE I210+c™ meter contains lethal voltages. The meter must be completely disconnected from any external circuits before disassembly is attempted. Failure to observe this practice can result in serious injury or death.

CAUTION: *Do not interchange base and electronics module assemblies between meters. Calibration data stored in the meter is particular to a set of current sensors and electronics module. Interchanging these components causes the meter to lose calibration.*

The meter is disassembled in steps. First, remove the meter cover. Second, remove the electronics module from the base.

4.4.1 Removing the Meter Cover

Remove the meter cover as follows:

1. Remove the seal from the right side of the meter. If there is no seal, proceed to the next step.
2. Turn the cover counterclockwise approximately 30 degrees.
3. Lift the cover straight up.

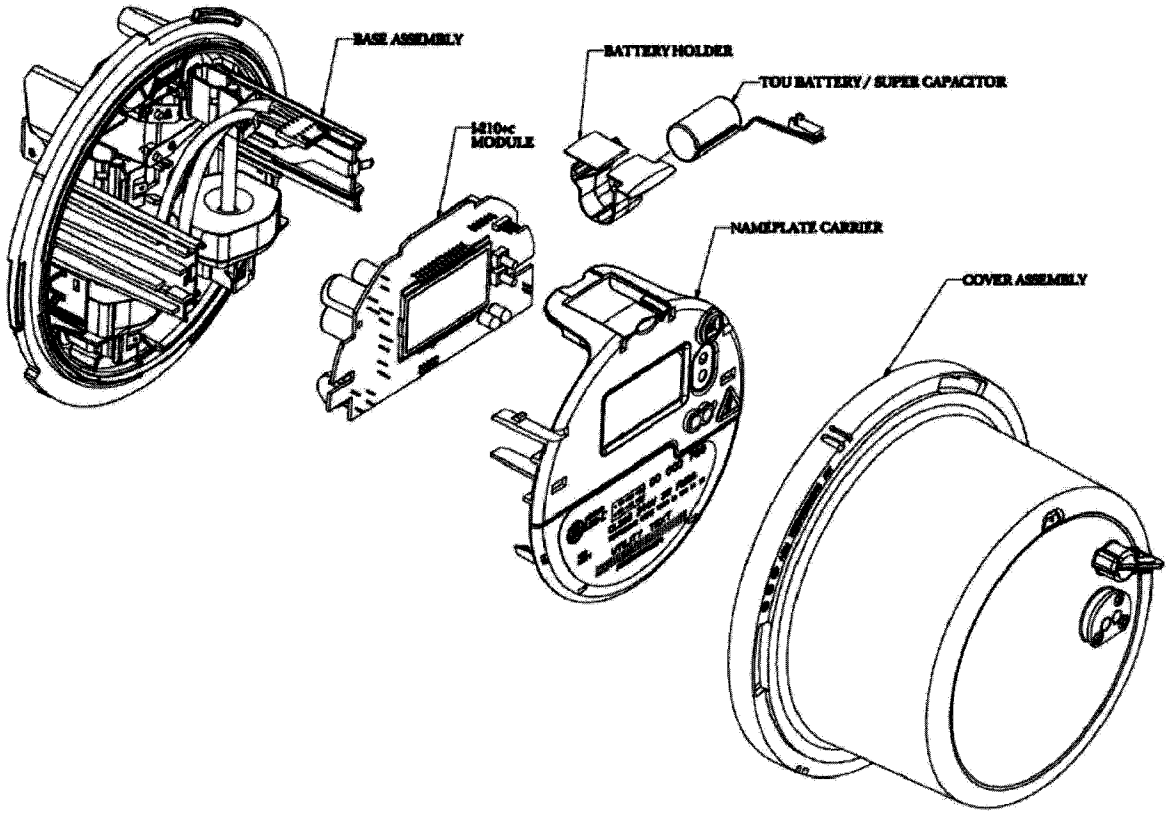
4.4.2 Removing the Electronics Module

To remove the electronics module, follow the instructions below:

1. Disconnect the CT connector from the socket on the electronics module.
2. Grasp the snaps on either side of the nameplate carrier between the thumb and index finger and press them together to release them from the notches on the base posts. It may be easier to unclip one side at a time. Ensure that all four snaps are disengaged and lift the module assembly off the base.
3. Place the module on a flat, clean, cloth-covered surface with meter face down.

CAUTION: *Do not pull on the wires to disengage the connectors. Pull only on the connectors.*

Figure 4-1 Exploded View of I210+c™ Meter



4.5 Meter Reassembly

1. Carefully align the module over base assembly posts and push down firmly to engage all four snaps on the post undercuts.
2. Connect the CT sensor connector to the socket on the electronics module.
3. Replace the cover by aligning it with the openings in the base and rotating it clockwise approximately 30 degrees.
4. Install security seals as required.

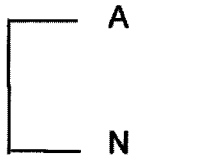
5. Site Guides

NOTICE: *The site information includes rudimentary connection diagrams. These diagrams are not metering installation guides.*

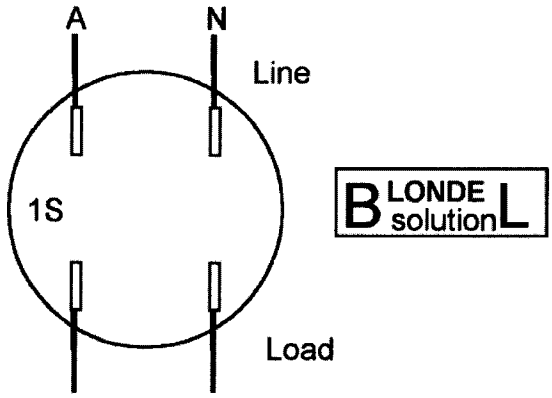
The PHASOR diagrams are shown for informational purposes only. The meter does not provide the information necessary to determine the phase relationships between voltages and currents.

I-210+c Site Guide

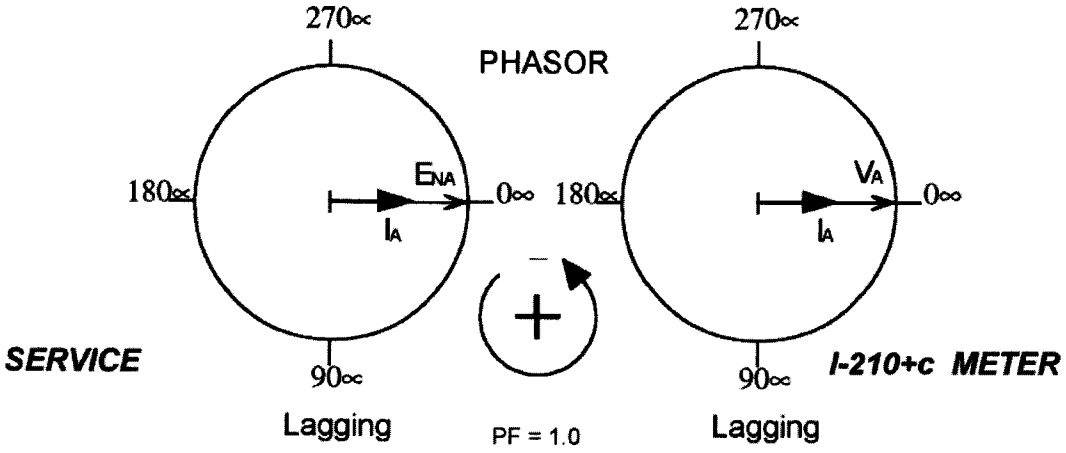
Form 1S *(Self-Contained)*



2-Wire
Single phase



BLONDE solutionL

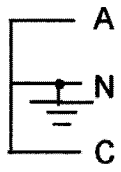


Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards

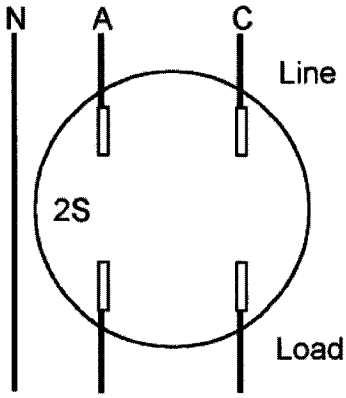
2-wire, 1-phase, 1-element

I-210+c Site Guide

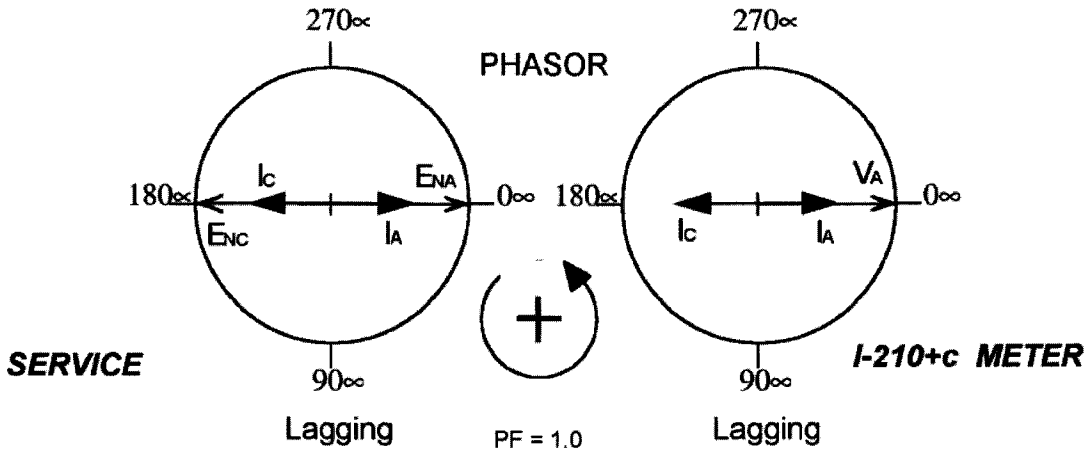
Form 2S *(Self-Contained)*



3-Wire
Singlephase



Accuracy is based on assumptions which, if not fulfilled, may result in systematic errors unrelated to meter calibration.

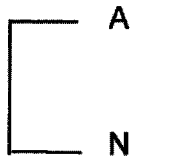


Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards

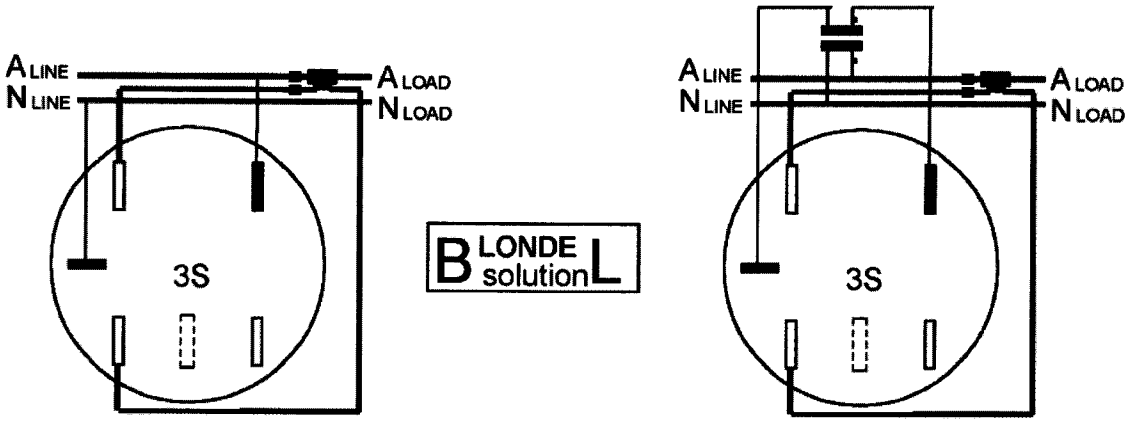
3-wire, 1-phase, 1-element

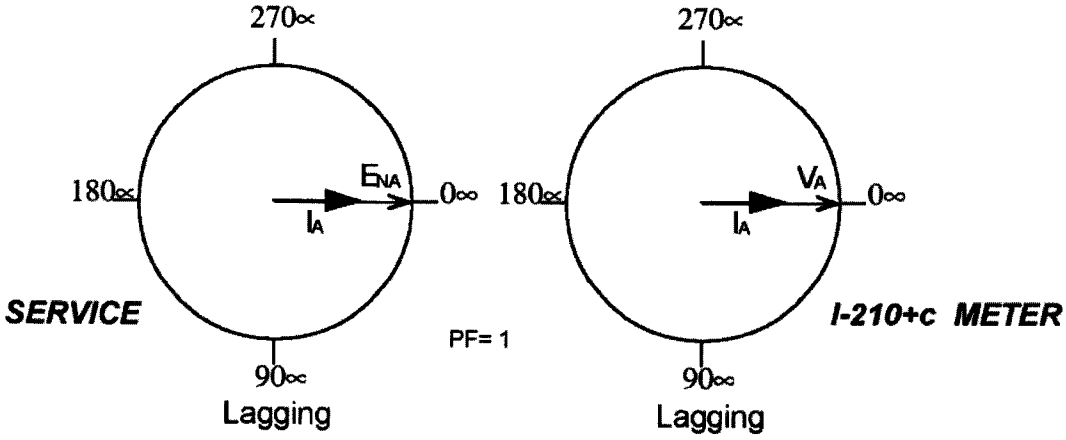
I-210+c Site Guide

Form 3S *(Transformer Rated)*



2-Wire
Single phase



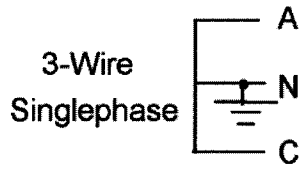


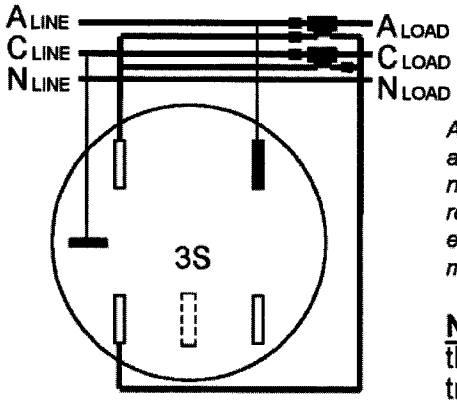
Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards

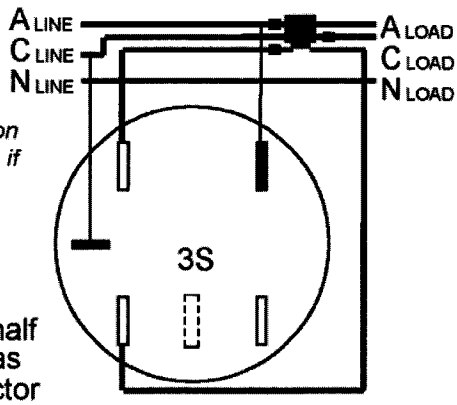
2-wire, 1-phase, 1-element

I-210+c Site Guide

Form 3S *(Transformer Rated)*

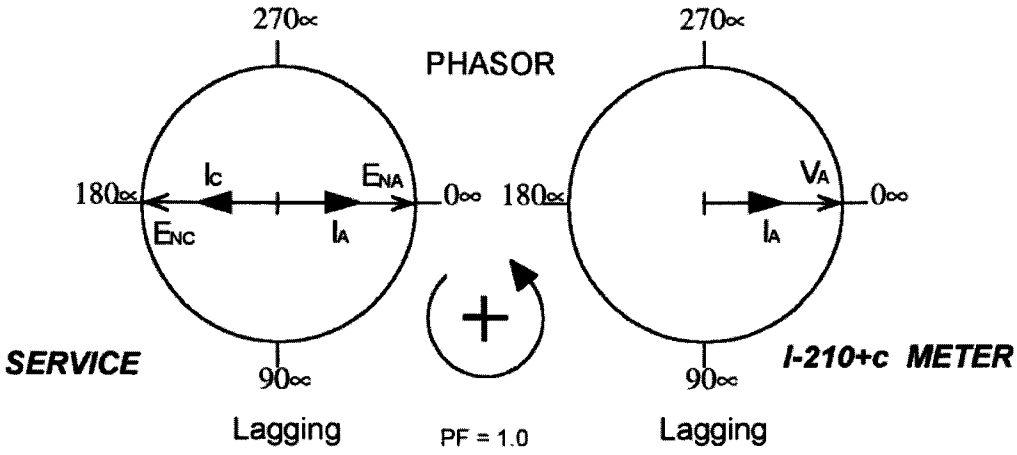






Accuracy is based on assumptions which, if not fulfilled, may result in systematic errors unrelated to meter calibration.

NOTE : Use half the CTs' ratio as transformer factor in determining meter multiplier, except for 3 – wire CTs.

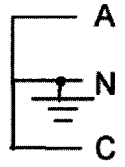


Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards

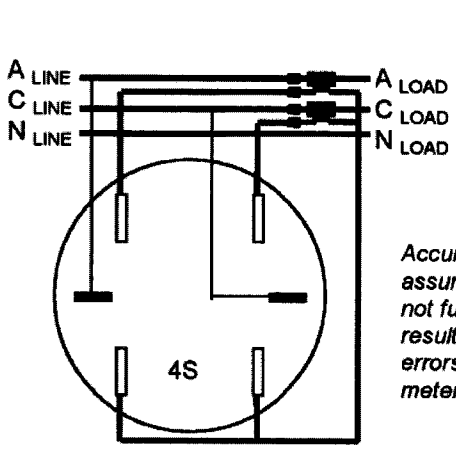
3-wire, 1-phase, 1-element

I-210+c Site Guide

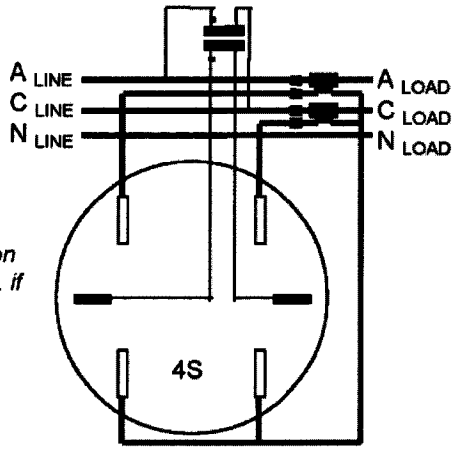
Form 4S *(Transformer Rated)*

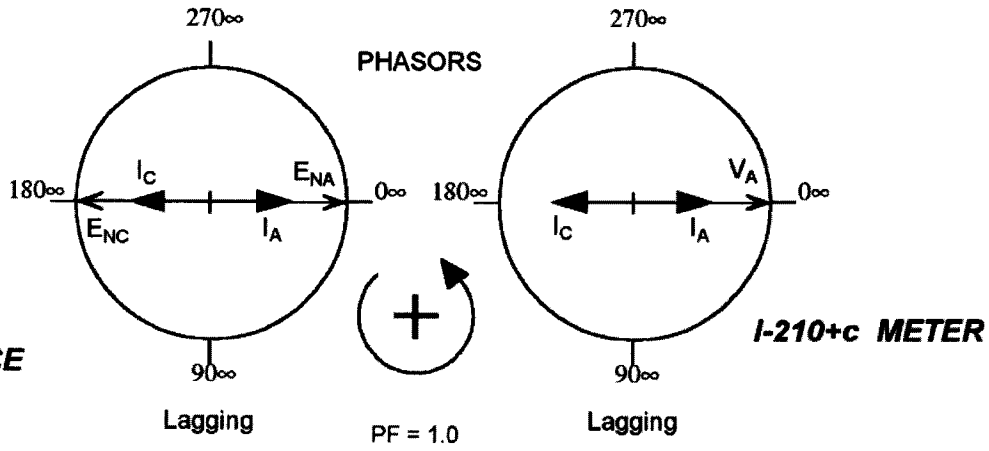


3-Wire Singlephase



Accuracy is based on assumptions which, if not fulfilled, may result in systematic errors unrelated to meter calibration.



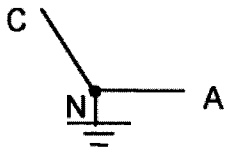


Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards

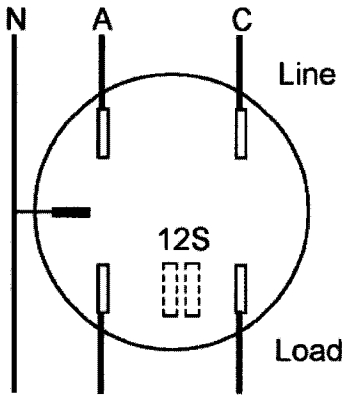
3-wire, 1-phase, 1-element

I-210+c Site Guide

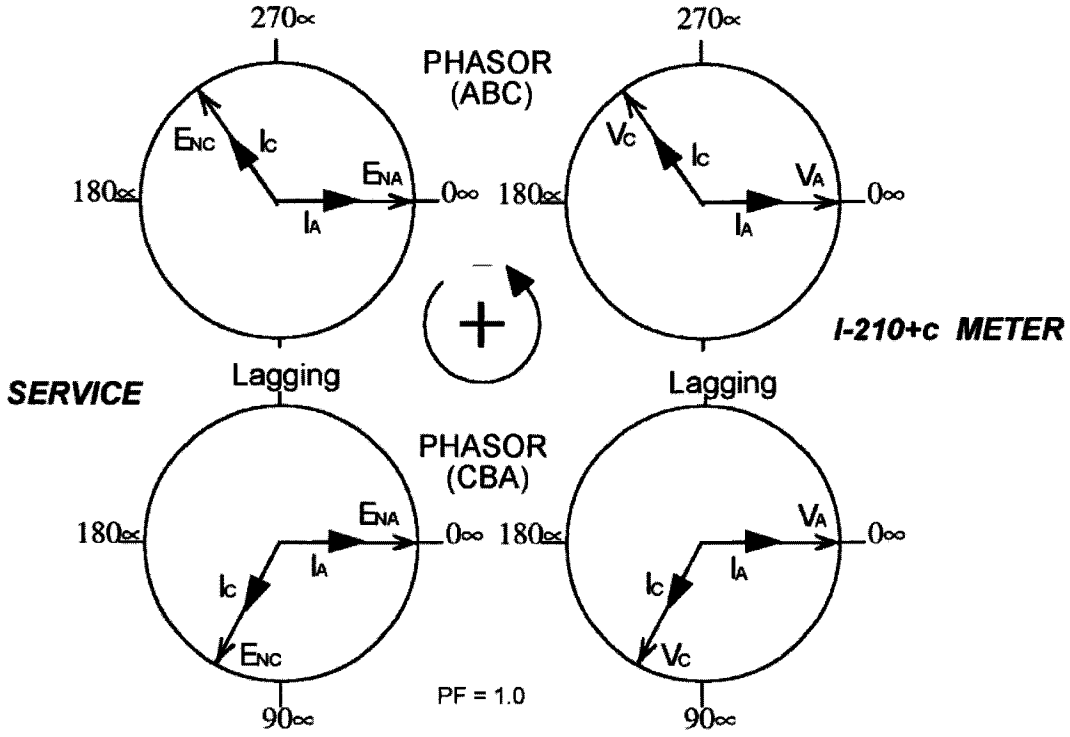
Form 12S *(Self-Contained)*



Network



BLONDEL solution

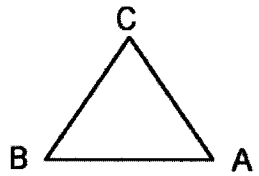


Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards

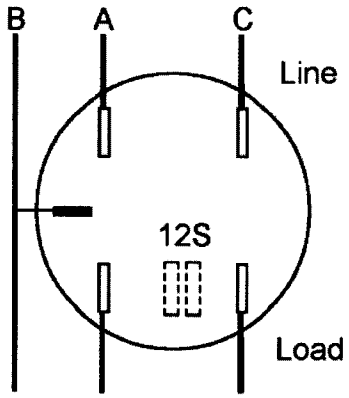
3-wire, Network, 2-element

I-210+c Site Guide

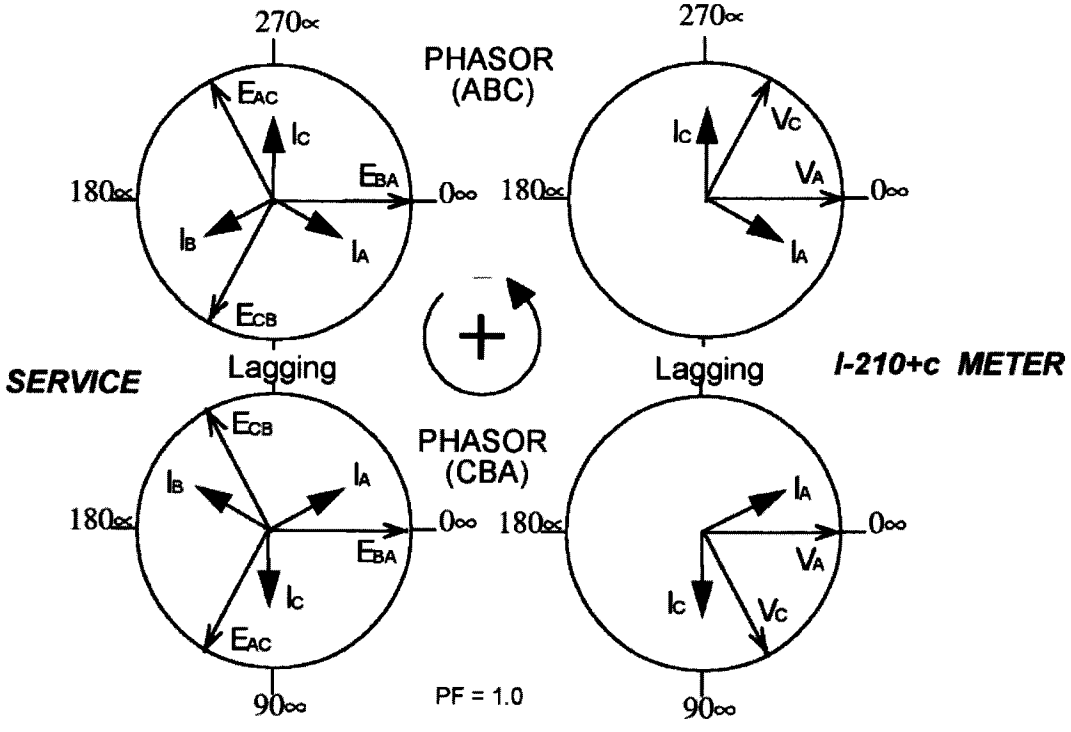
Form 12S *(Self-Contained)*



3-Wire, Delta



BLONDE solutionL

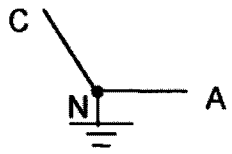


Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards

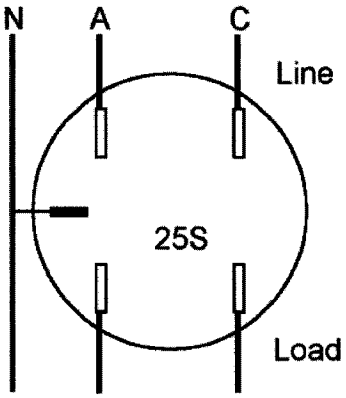
3-wire, 3-phase, 2-element

I-210+c Site Guide

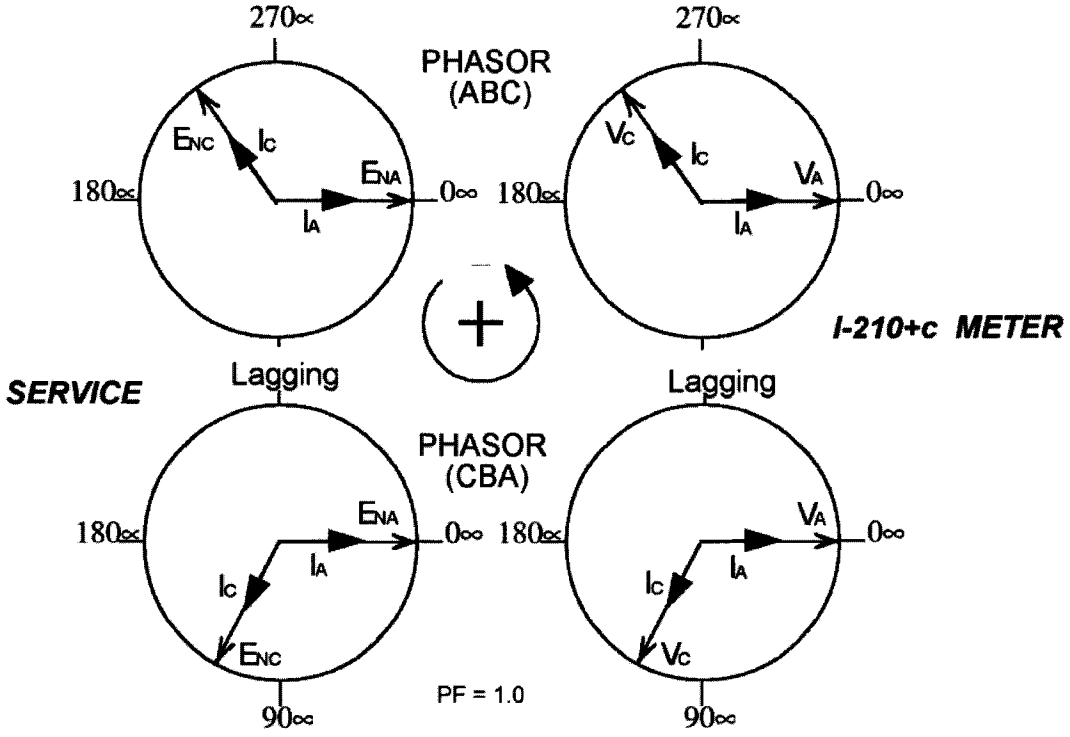
Form 25S *(Self-Contained)*



Network



B LONDE solution L



Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards

3-wire, Network, 2-element

6. Diagrams

Figure 6-1 ANSI Meter Diagrams

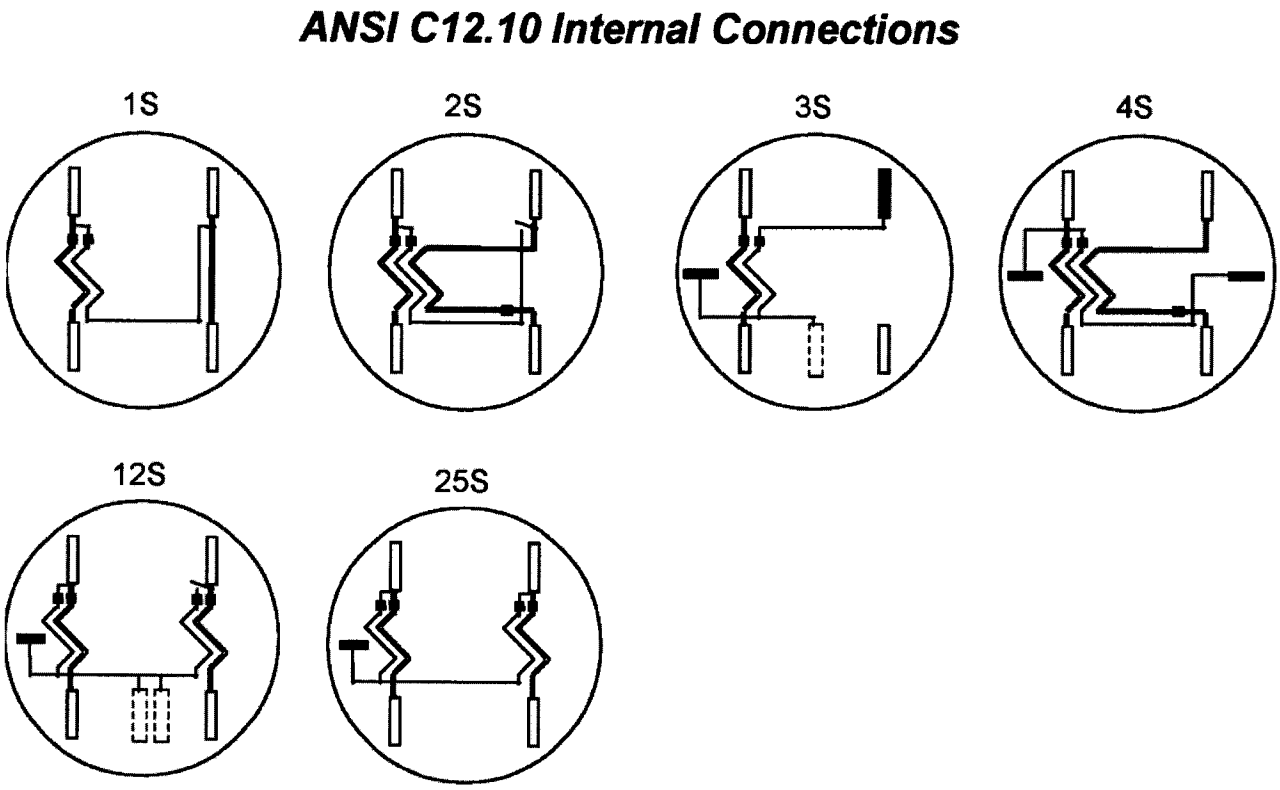


Exhibit GLK-3

Filed Highly Confidential and Highly Sensitive

TEXAS-NEW MEXICO POWER COMPANY **Exhibit GLK-4**
APPROXIMATE COVERAGE CALCULATIONS AS OF MARCH 25, 2010

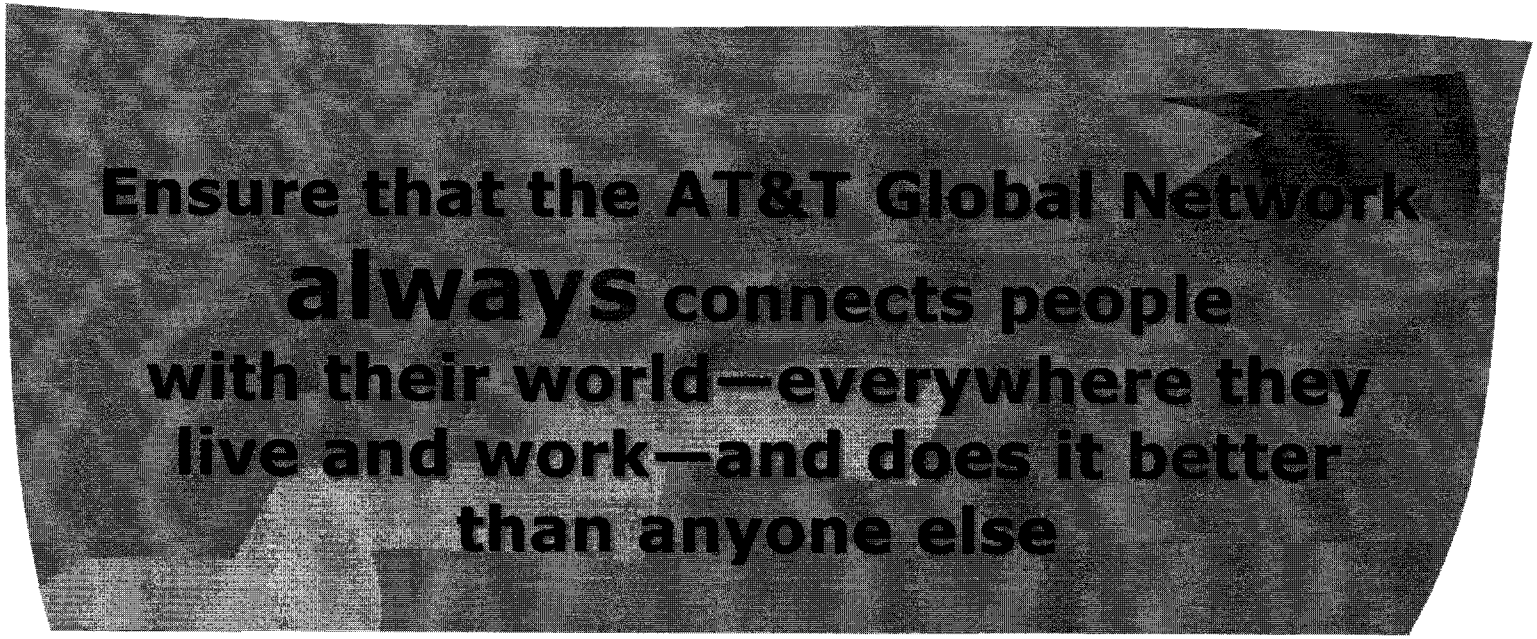
City	Deployment Location	Number of Non-Com Points
Eliasville	North Texas	147
Fort Stockton	West Texas	568
Gatesville	Central Texas	3
Gordon	Central Texas	4
Graham	North Texas	11
Jean	North Texas	30
Loving	North Texas	61
Newcastle	North Texas	3
Nocona	North Texas	4
Olney	North Texas	183
Saint Jo	North Texas	1
Sanderson	West Texas	13
Strawn	Central Texas	2
Valley Mills	Central Texas	1
Total		1031

Deployment Location	Number of Non-Com Points	Total Points	Total Coverage
Gulf Coast		119,859	100%
Lewisville		40,592	100%
North Texas	440	26,326	98%
Central Texas	10	25,696	100%
West Texas	581	16,301	96%
	1031	228,774	99.5%

WEBINAR
Briefing on
AT&T Network Disaster Recovery

Robert Desiato, Director
Network Disaster Recovery
AT&T Global Network Operations

Global Network Operations Mission



Provide Comprehensive and Seamless Customer Application Service Quality, by preventing, detecting and correcting failures in the network before they impact the service experience.

Network Scale and Scope

MPLS nodes serving Around the world

Hundreds of Thousands of backbone fiber Miles worldwide

Millions of Wireless Customers

Wi-Fi hot spots around the world

In the 2Q of 09 AT&T handled over 100 Billion Text messages

24x7x365
Network monitoring & management

Industry Leader Leaders Quadrant
Global, Pan European, US, Asia Pacific Network Service Provider, Web Hosting, IP Conferencing and Wireless Service (Gartner surveys, 2006 through 2009)
Leader in Global Networking for Multi Nationals (IDC 12/2008)
Most Complete footprint for enterprise managed service contracts of top 5 global providers (Ovum 1/2009)
US Enterprise Telecom Leader (Oct 2008)
MPLS North American Leader (Forrester 10/2008)

Best in Class
World's Most Admired Telecommunications Company, *Fortune* Magazine (2008-2009)
"Highest Customer Satisfaction" among large business customers of local telephone service (J.D. Power and Associates, 2008)

100%
Fortune 1000 companies are AT&T customers

Thousands of Major network buildings— and many thousand of satellite locations

Millions of Access and Broadband Lines

Millions of Video and U-Verse customers,

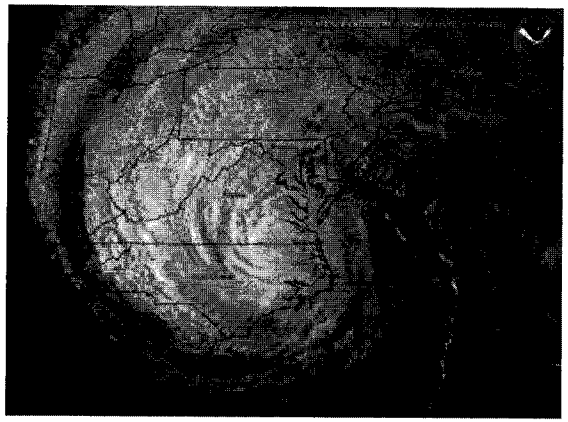
Petabytes of data handled each day

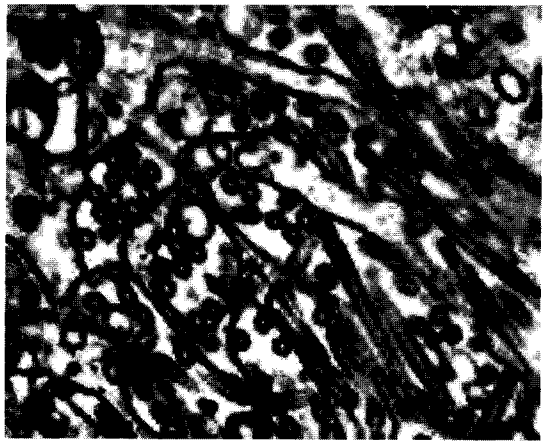
Internet Data Centers around the world

at&t

Securing Our Network

NETWORK RISKS





Am I Ready?
Are You Ready
Are We Ready?

PHYSICAL | LOGICAL | ECONOMIC | POLITICAL | SOCIAL

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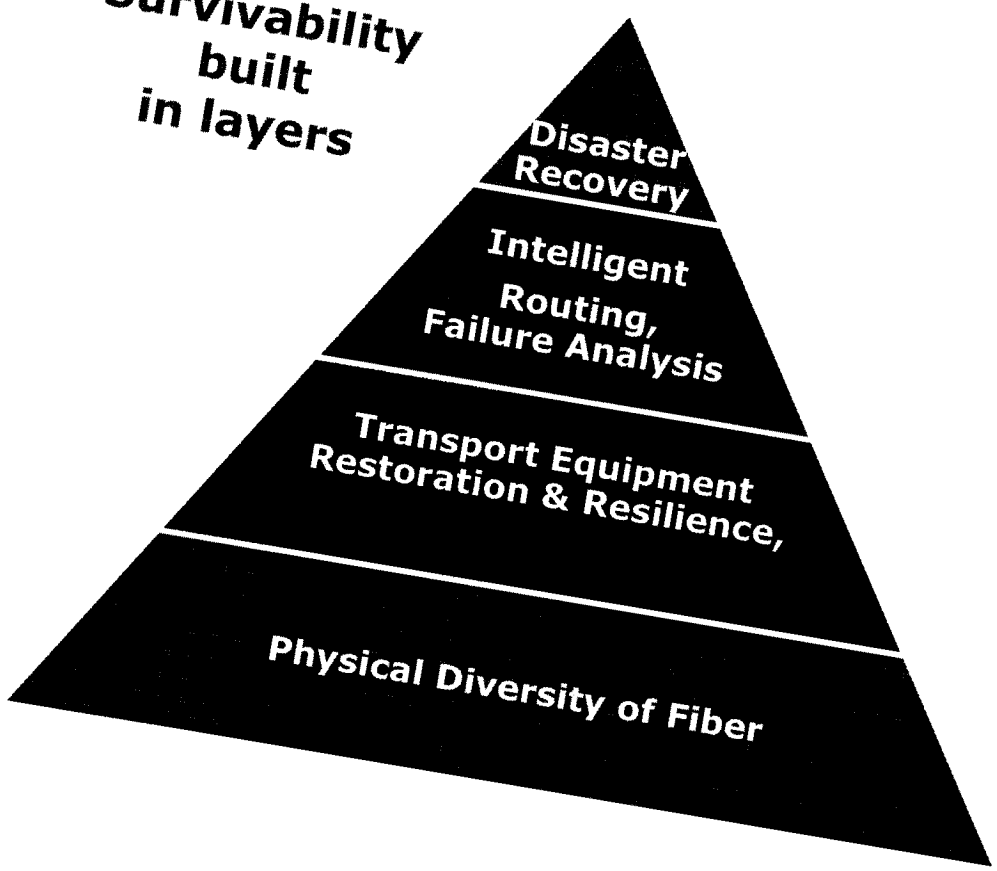
AT&T Network Survivability Protocol



Network Disaster Recovery

- Manual Repair, if necessary.
- Automatic Reconfiguration
- Automation Isolation and Root Cause Correlation.
- Intelligent Monitoring
- Rigorous Pre-deployment Testing.
- Network Designed for Resiliency from the Ground Up.

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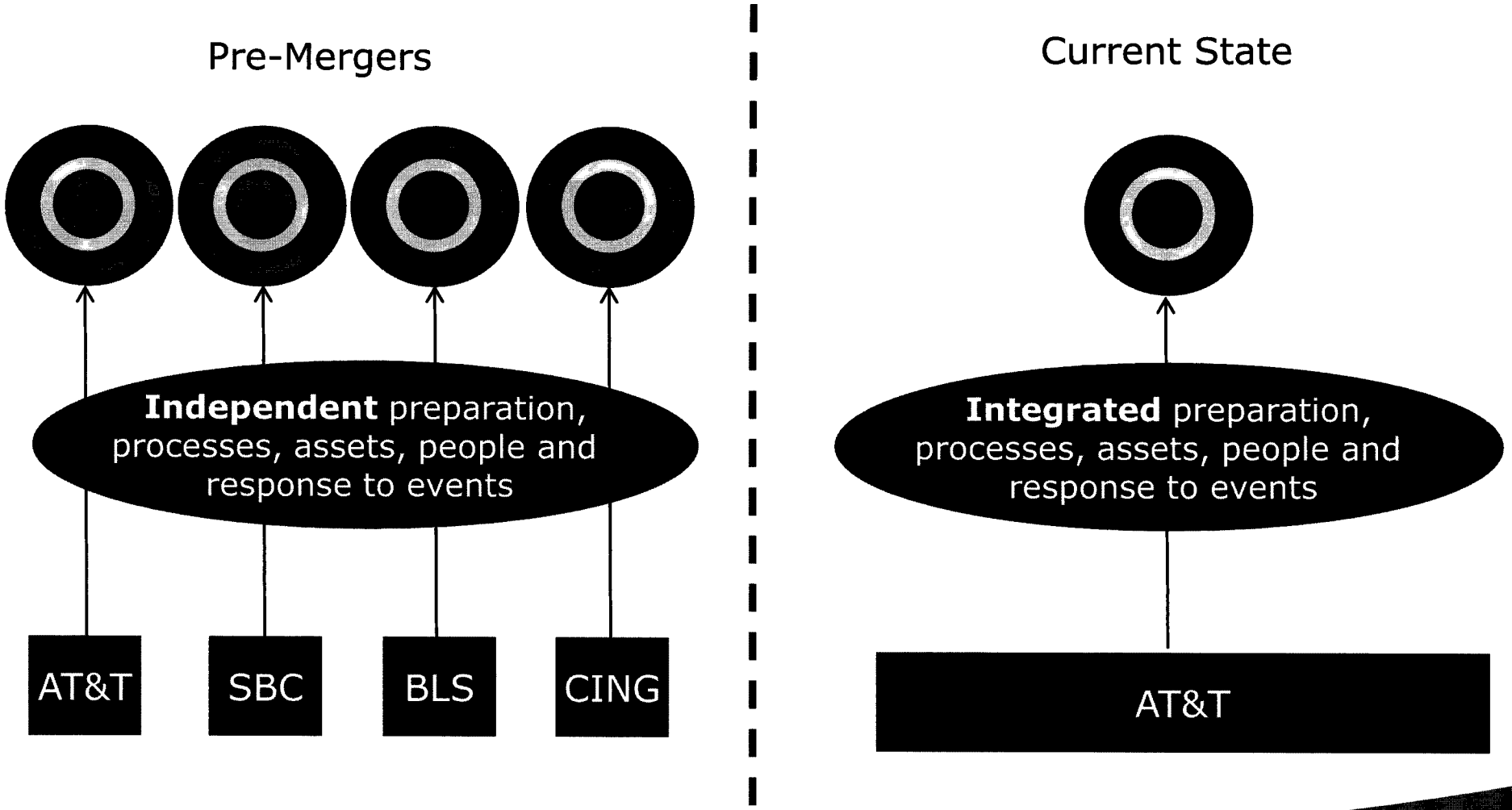
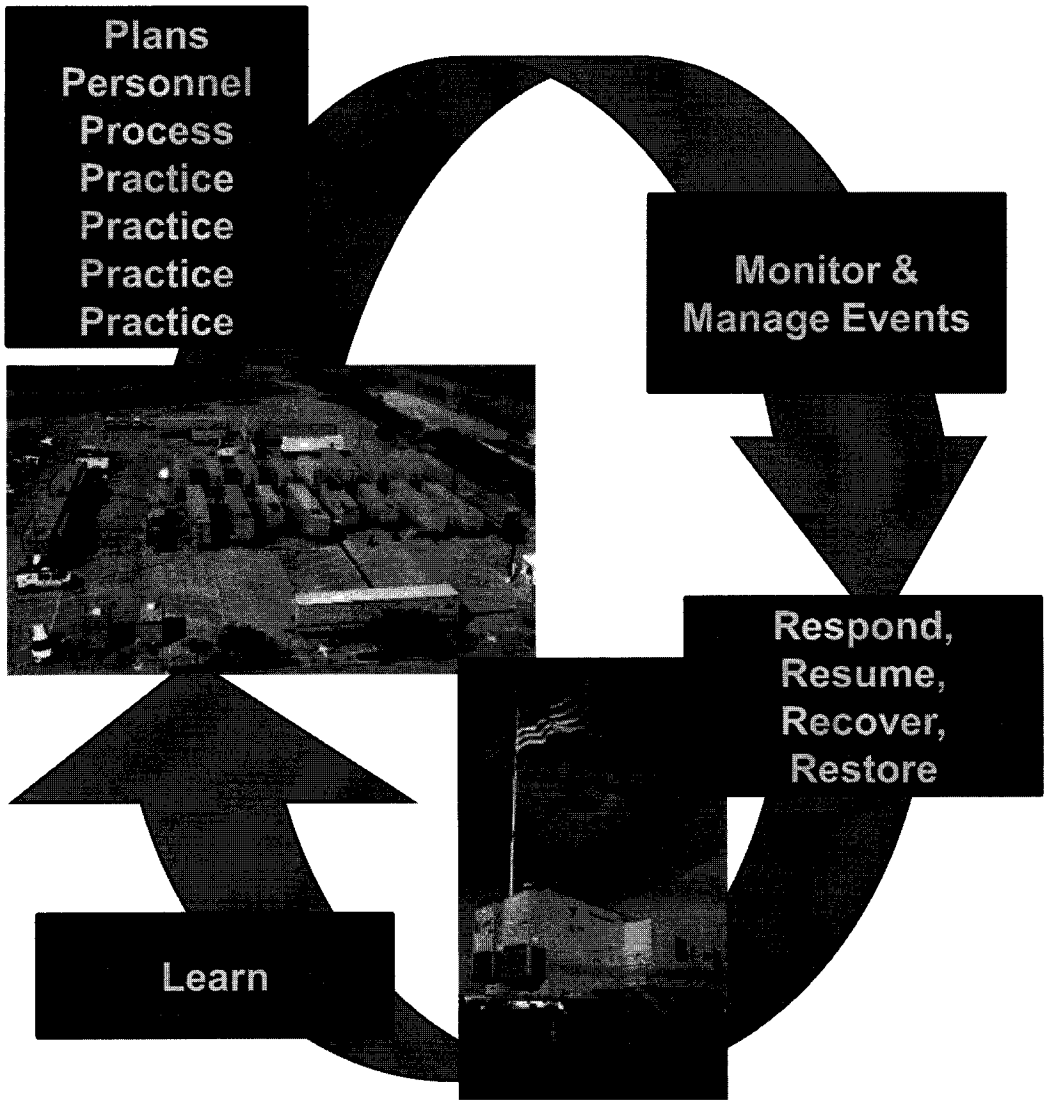
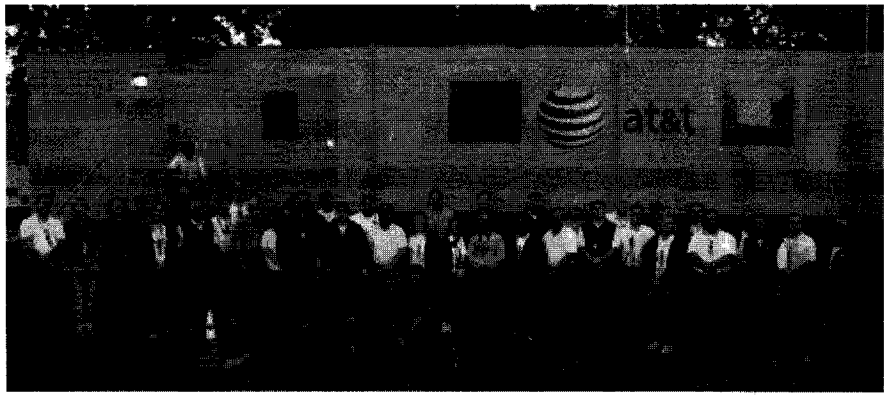
AT&T Post-Mergers – Better Response Capability

AT&T is positioned with phenomenal scale and depth of Resources and Technology available to apply to Network Recovery and Restoration.



AT&T Network Continuity Best Practices





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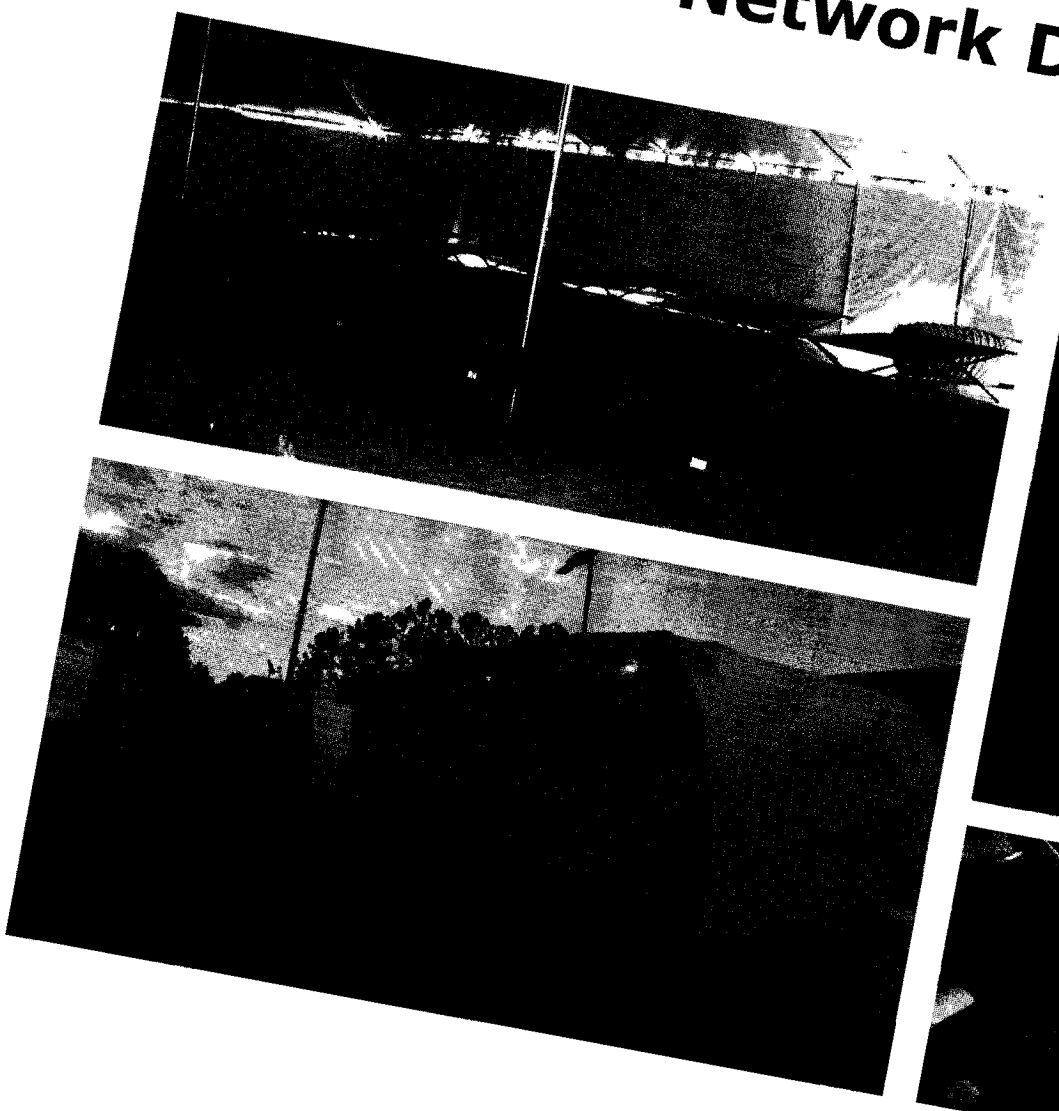
AT&T NDR — Field Exercises

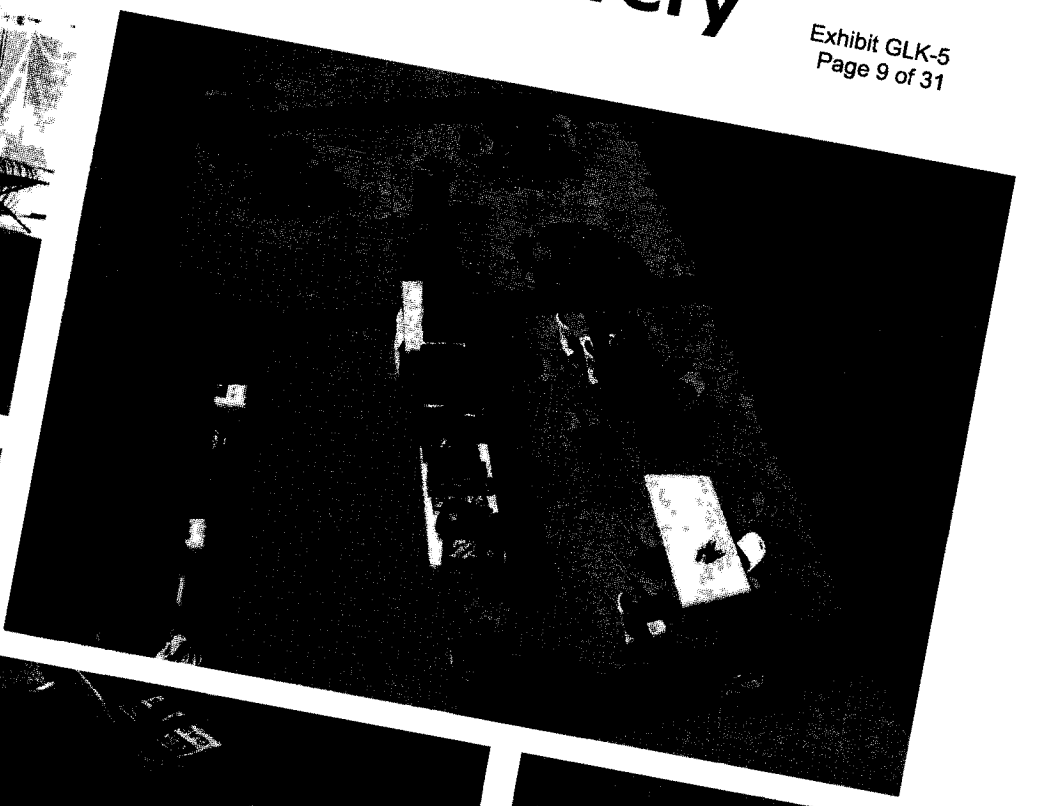
The NDR team has conducted field exercises three or four times a year since its formation in 1992. The exercises test as many of the NDR processes as possible, from the initial call-out, to equipment transportation and setup, to technology turn-up and testing. At these exercises, team members are given hands-on training on new technologies and the recovery equipment is operated in field conditions. The drills are held throughout the United States in a wide variety of weather and settings and using a variety of recovery scenarios.

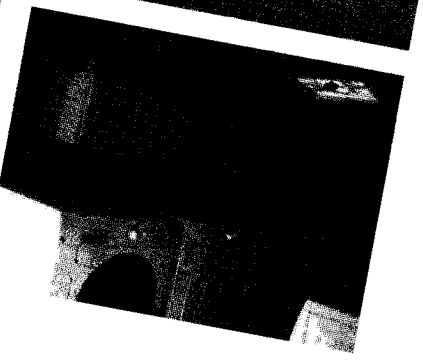
NDR's 2010 exercise schedule:
Dates are for Employee Day, Customer Day

- **New Orleans – 3/16, 3/17**
- **Detroit/Dearborn – 5/11, 5/12, 5/13**
- **San Francisco (proposed) – 7/3, 7/14**
- **Philadelphia (Proposed) – 10/19, 10/20**

AT&T Network Disaster Recovery







Support Infrastructure

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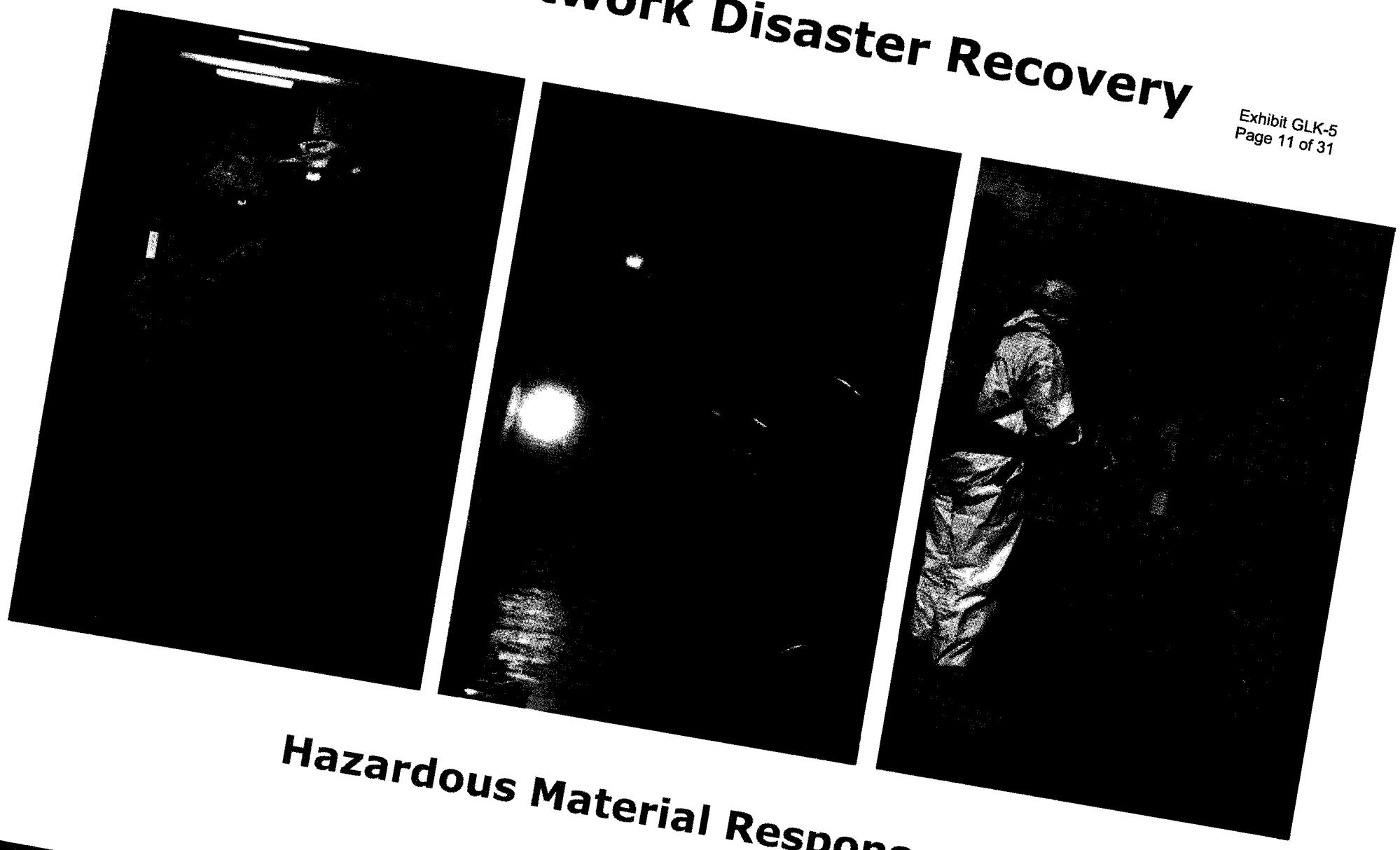
AT&T Network Disaster Recovery

Theodore Vail

Dedicated **Teamwork**

Well-practiced and tested team of telecom disaster recovery professionals supplemented by a large pool of volunteers who train together during quarterly field exercises.

AT&T Network Disaster Recovery



Hazardous Material Response

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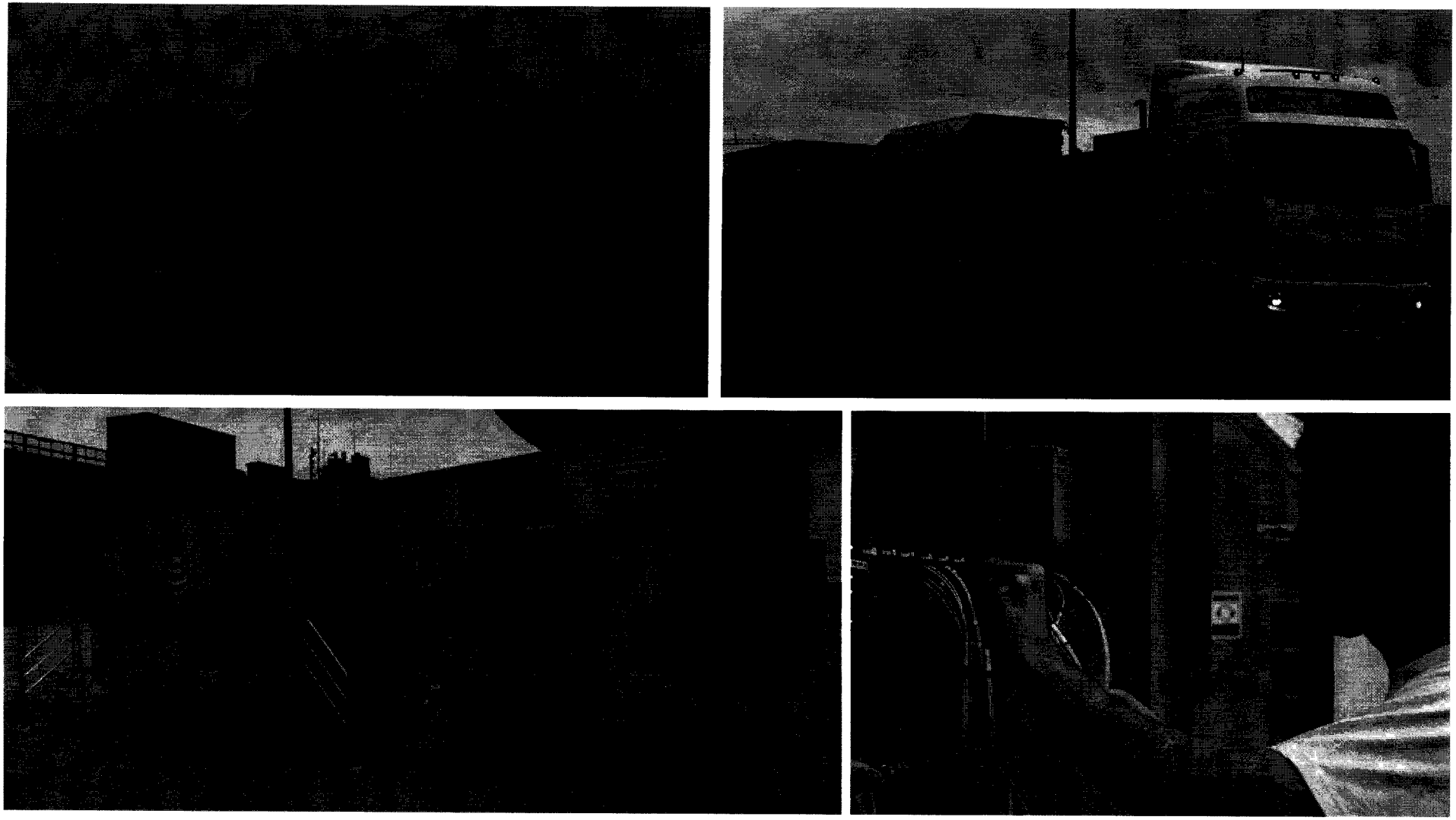
AT&T Network Disaster Recovery



MOW Recovery Equipment AGN

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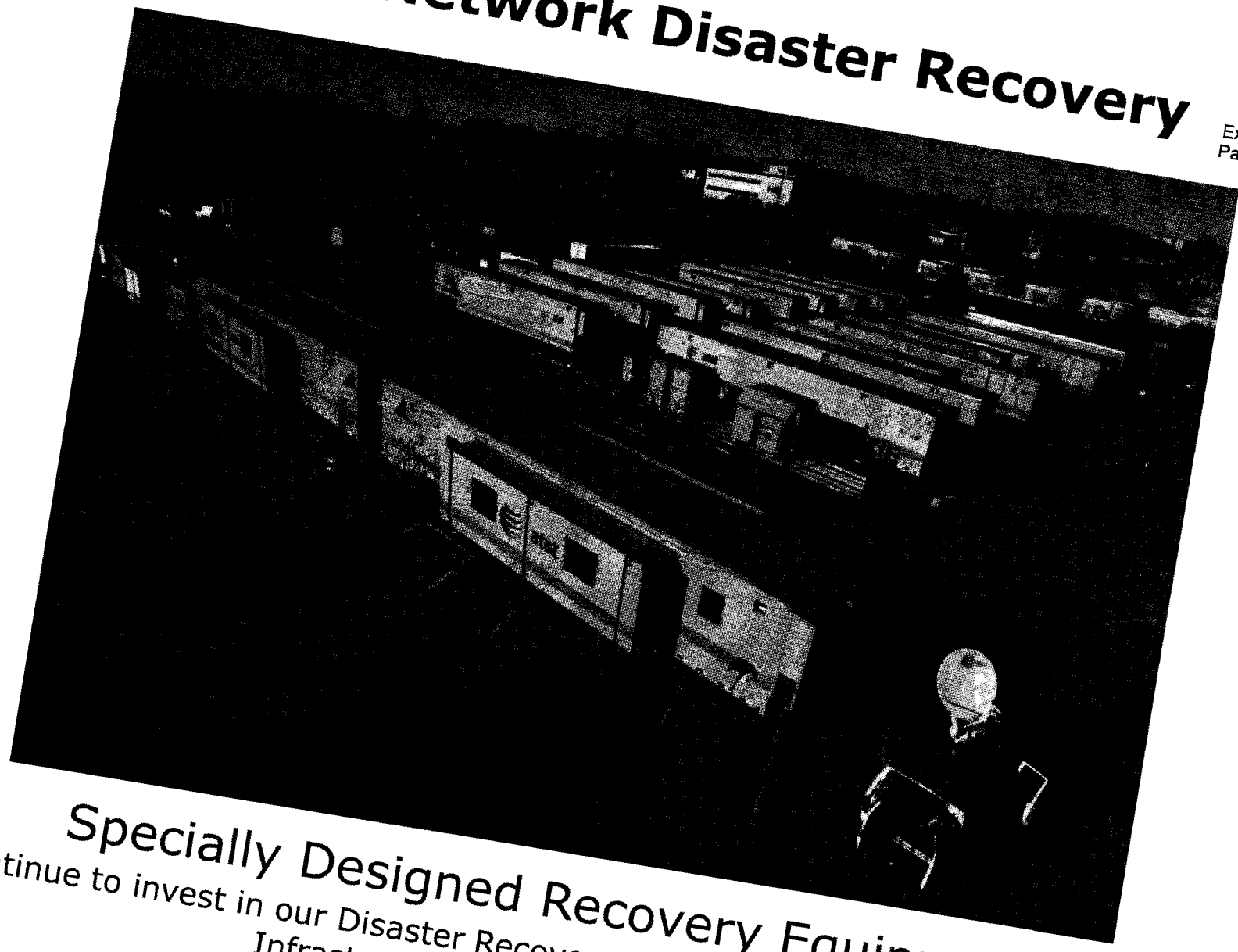
AT&T Network Disaster Recovery



Specially Designed Recovery Equipment

Continue to invest in our Disaster Recovery Equipment including, Technology, Infrastructure and Support Elements

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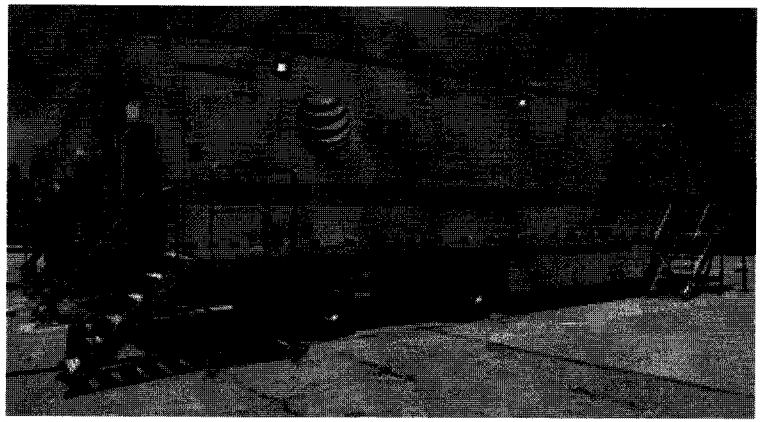
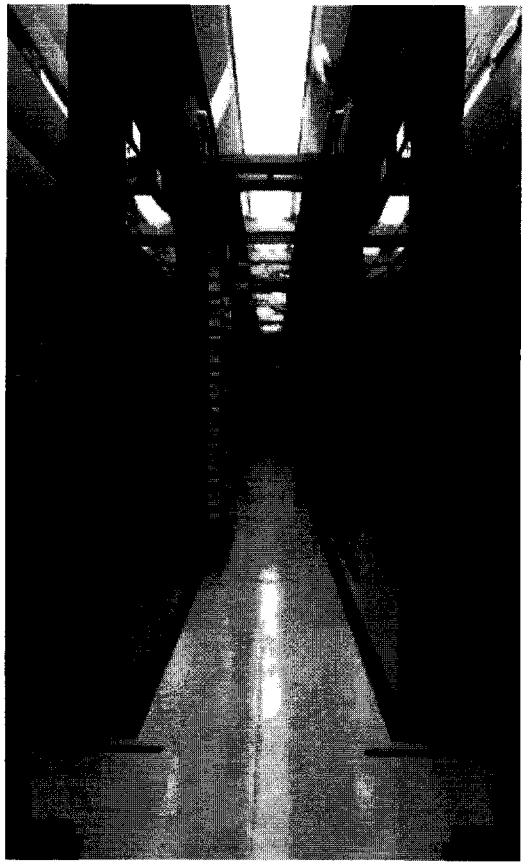
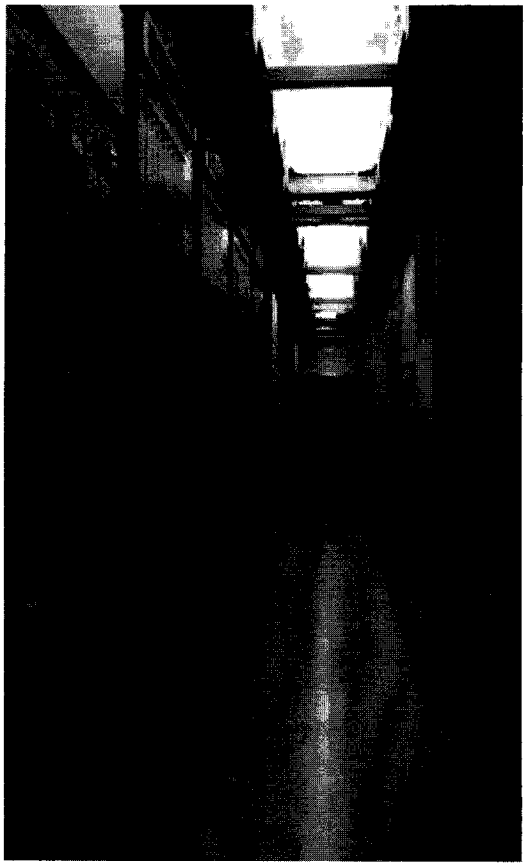
AT&T Network Disaster Recovery







Recovery Technology Trailers

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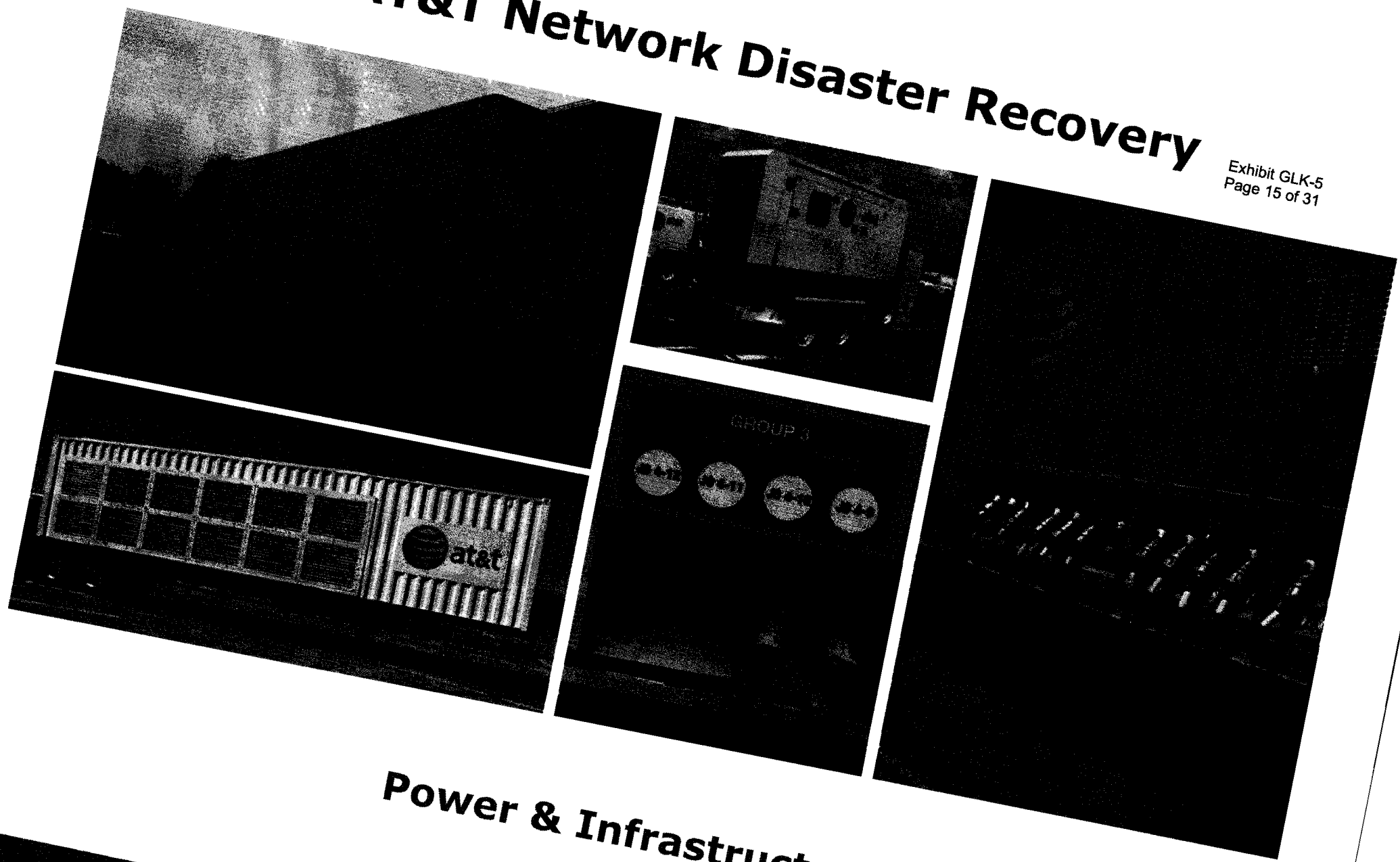
AT&T Network Disaster Recovery



Power & Infrastructure

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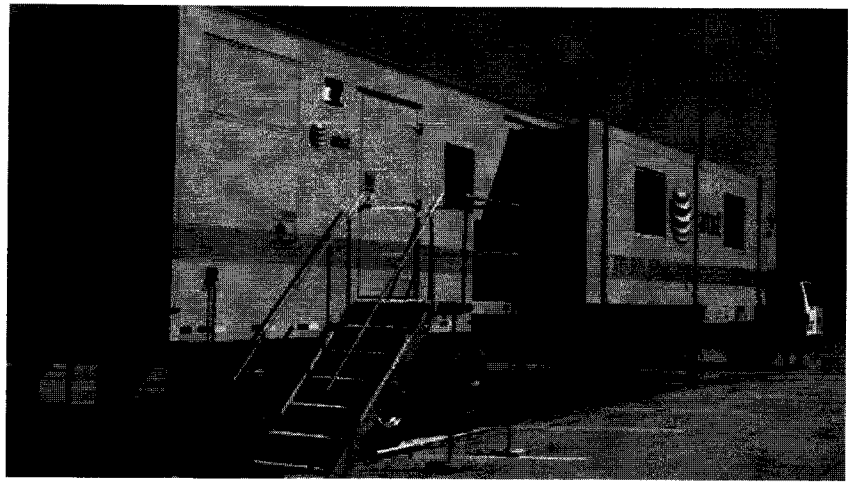
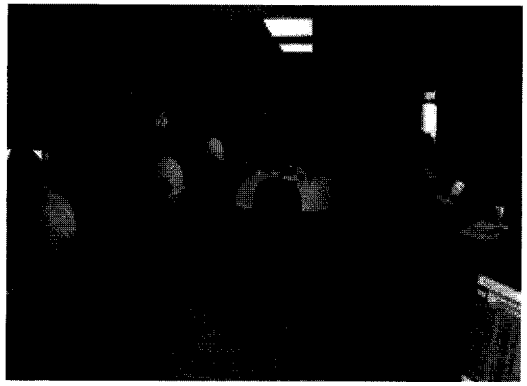
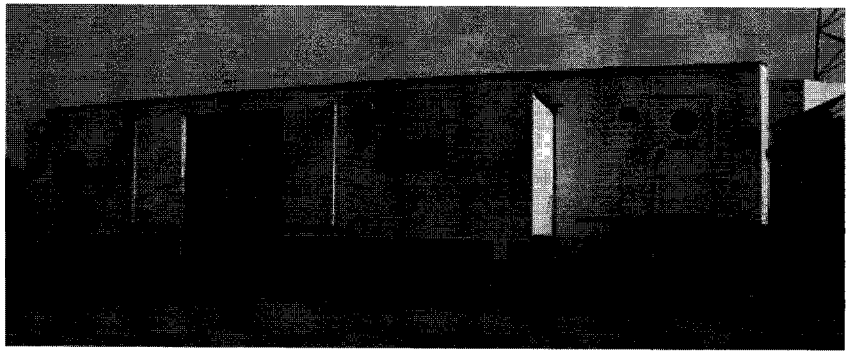
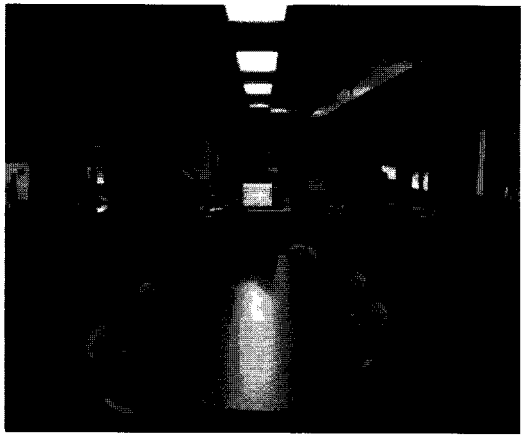
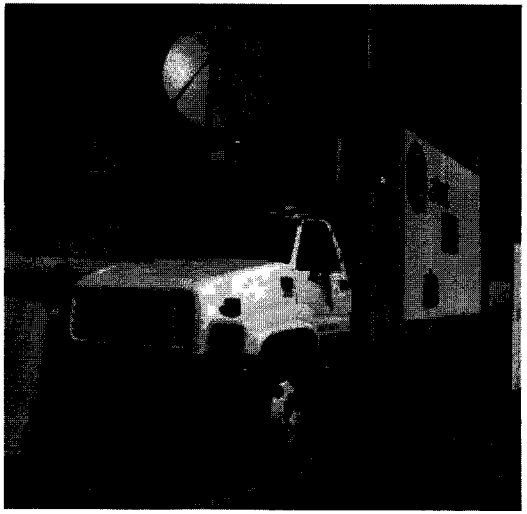
AT&T Network Disaster Recovery

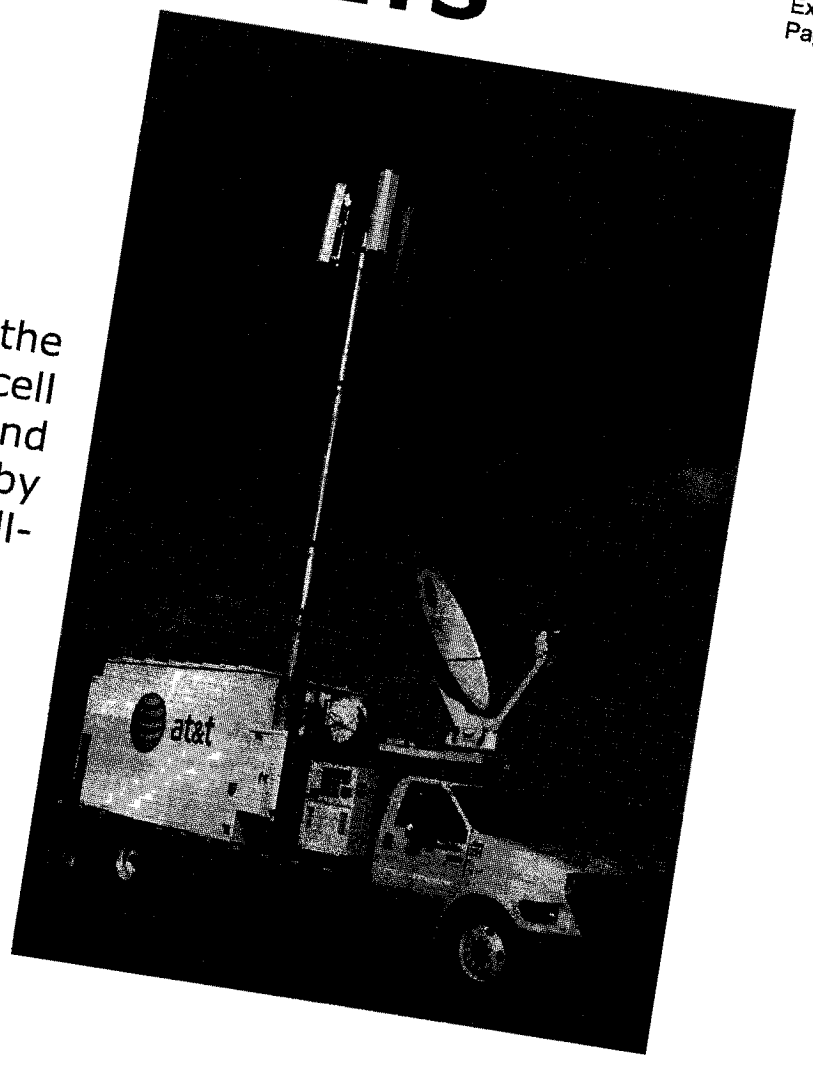



Command Centers
—
Emergency Communications

Satellite COLTS

The Network Disaster Recovery Team has the ability to provide satellite-based cell communications during disaster recovery and special situations. This capability is provided by two platforms: Cell-on-Wheels (COW) and Cell-on-Light Truck (COLT).



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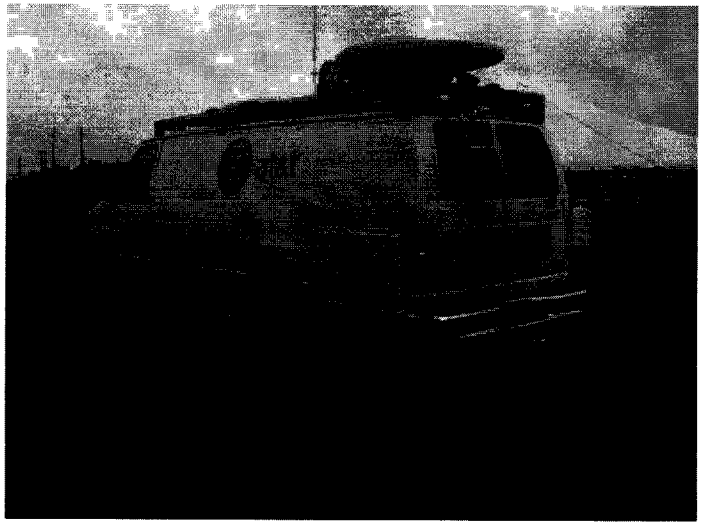
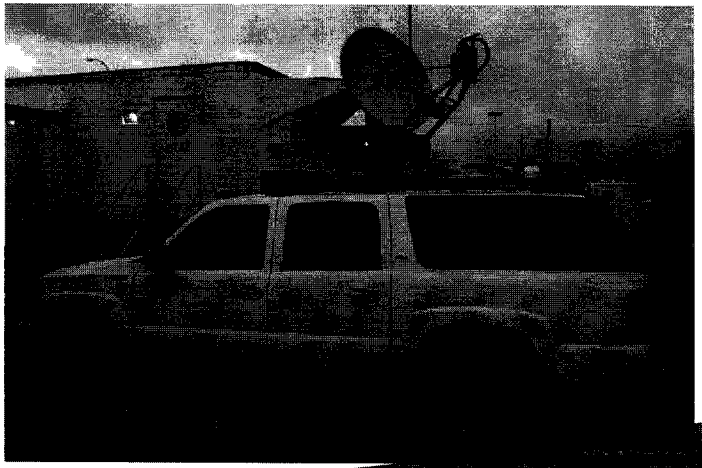
Emergency Communications Vehicle (ECV)

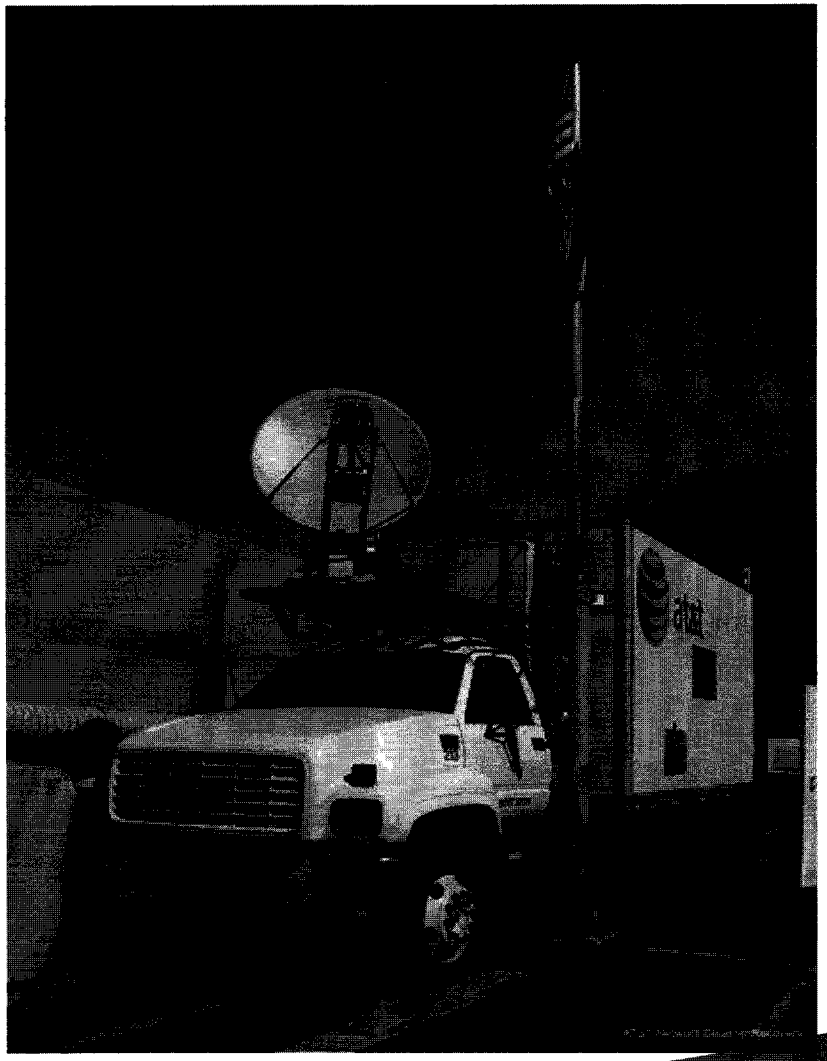
NDR satellite connectivity for voice over IP and data, which can be deployed when traditional connectivity to the AT&T Network is not available.





Emergency Communications Vehicle/Command Center

NDR satellite connectivity for voice over IP and data, which can be deployed when traditional connectivity to the AT&T Network is not available. This equipment also provides workspace for up to four personnel.



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AT&T 3CP — Command, Control, Communications

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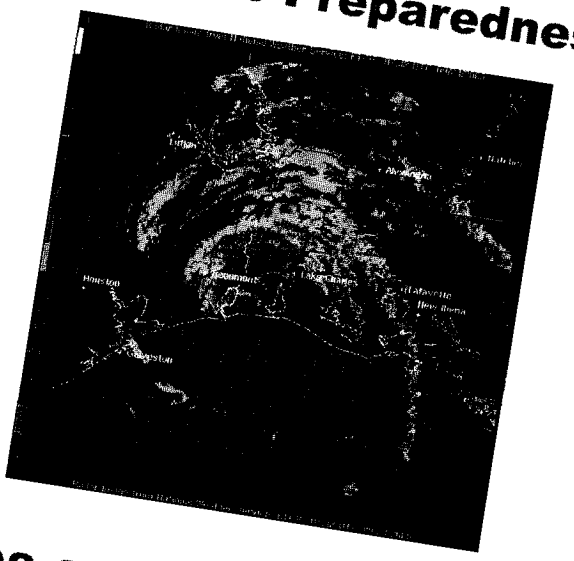
Pro-Active

Predictive

Preventive

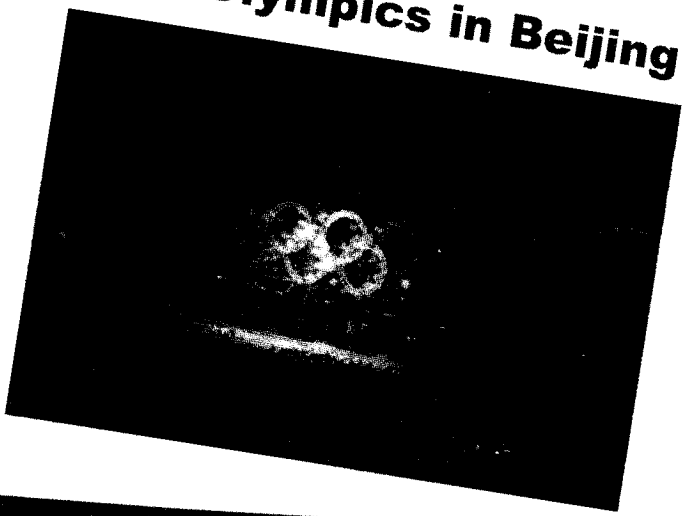
High Profile Events
U.S. Presidential Inauguration

Hurricane Preparedness



High Profile Events
2008 European Football Championships
Switzerland & Austria

2008 Olympics in Beijing



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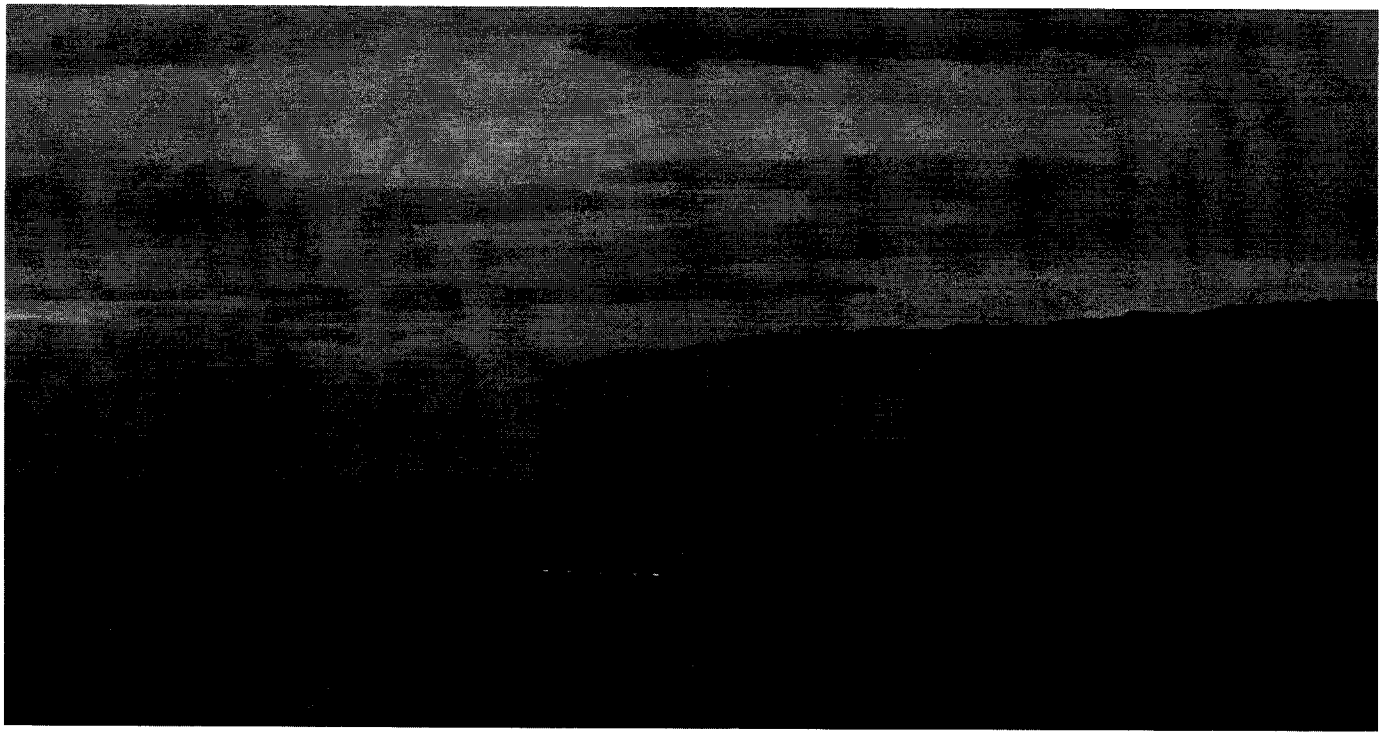
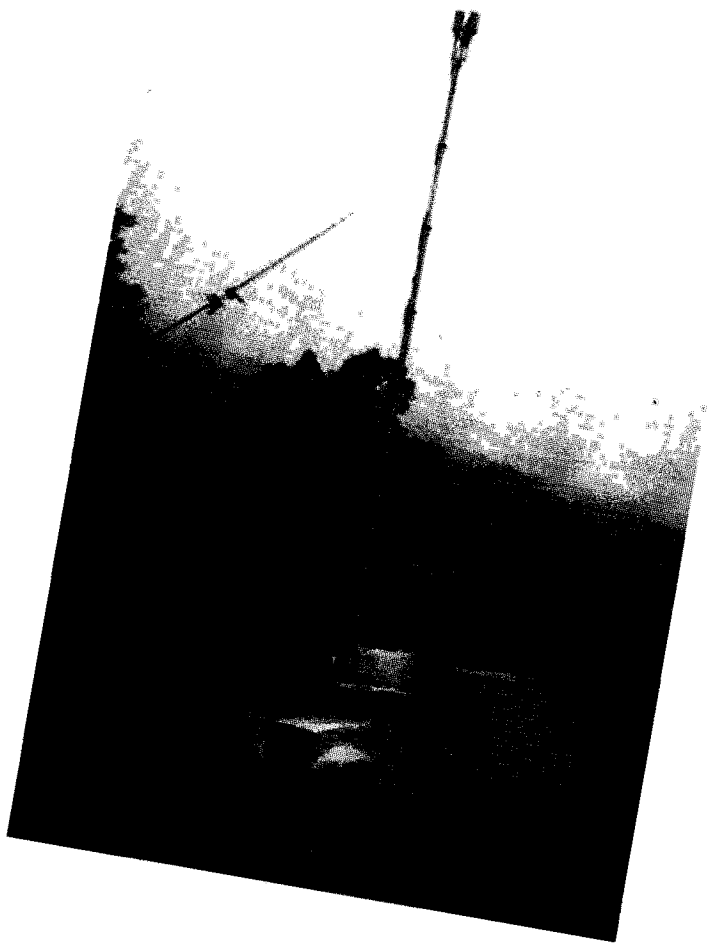
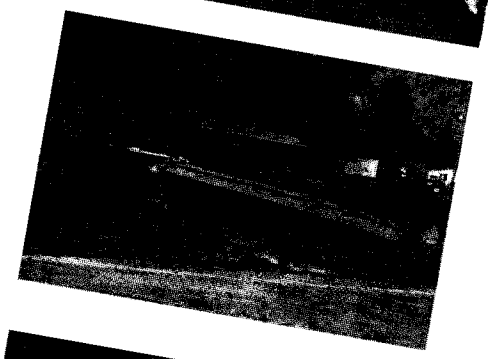
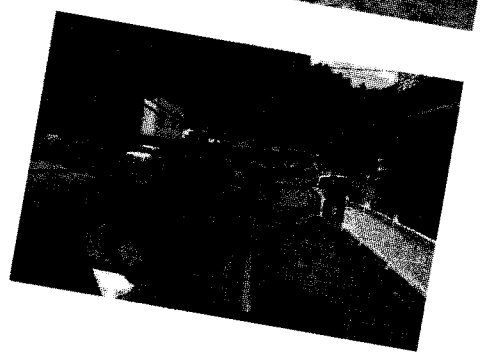
Examples of AT&T NDR — Deployments



May 2009 — WV National Guard — Flood Response







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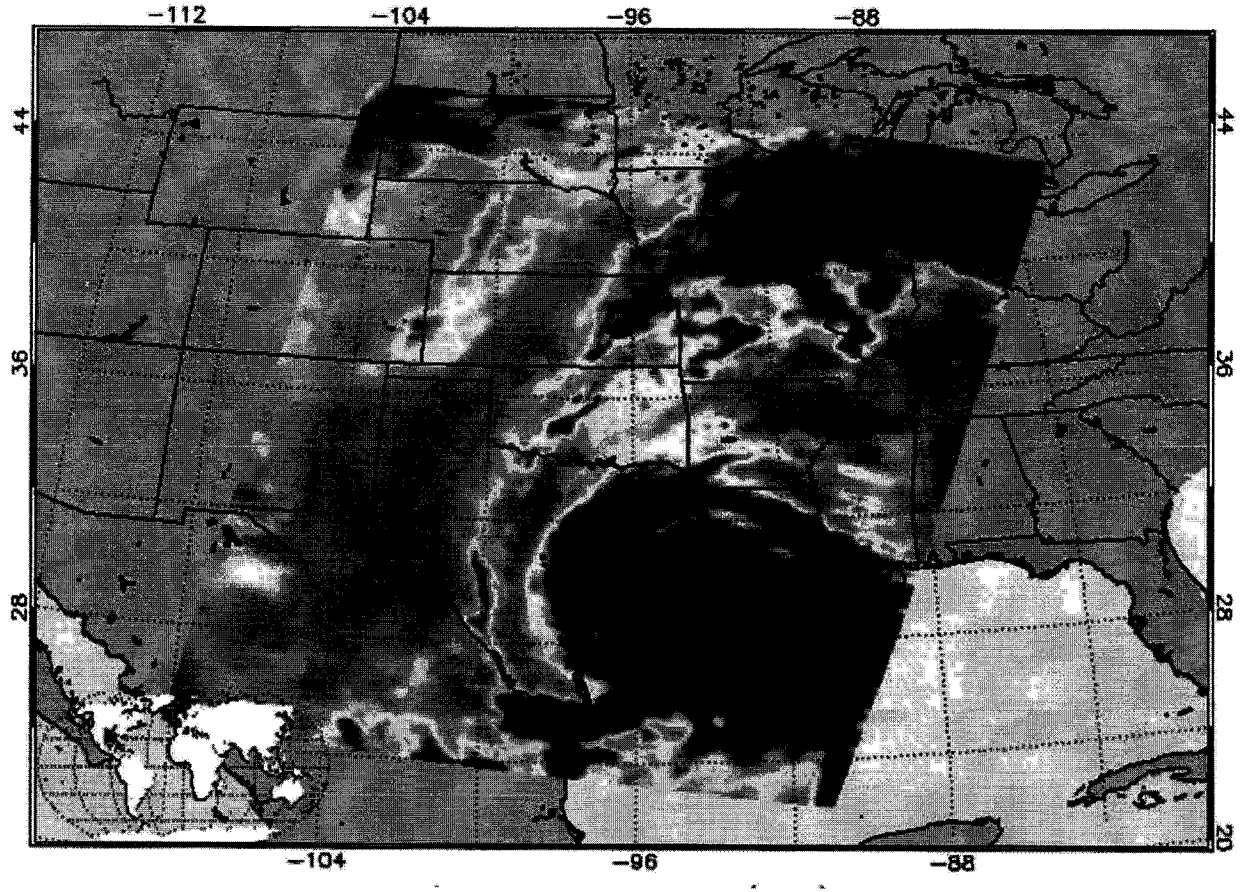
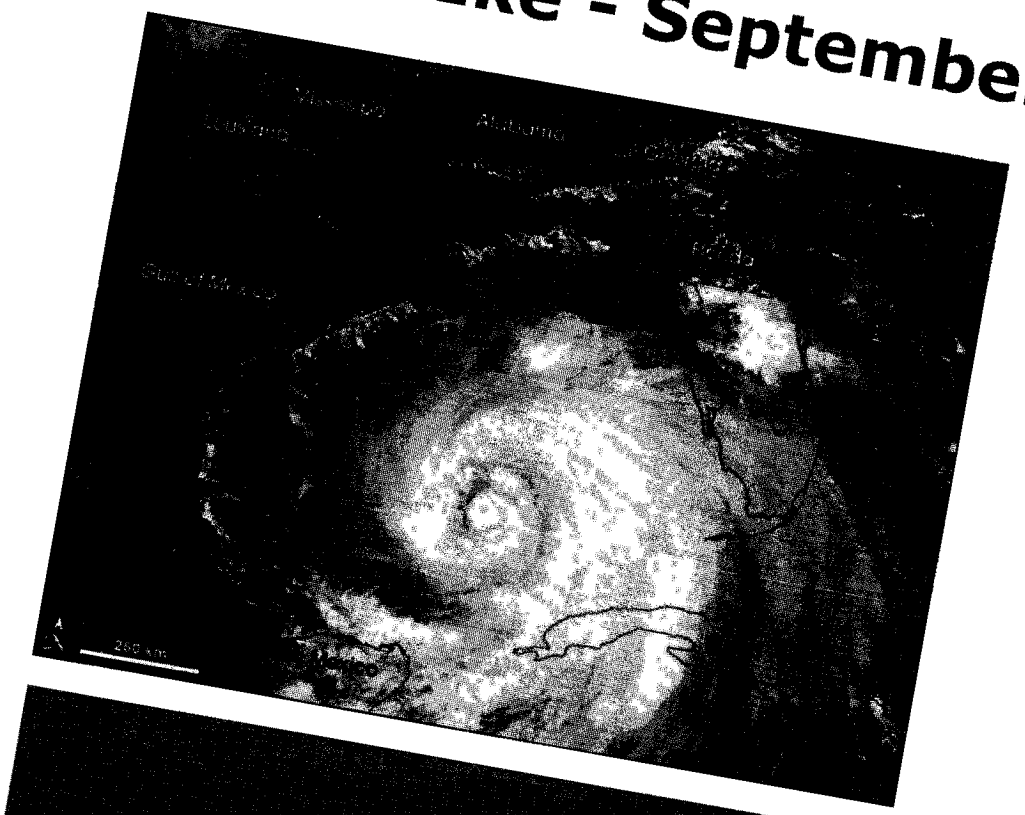
Hurricane Ike— September 2008



Hurricane Ike - September 2008



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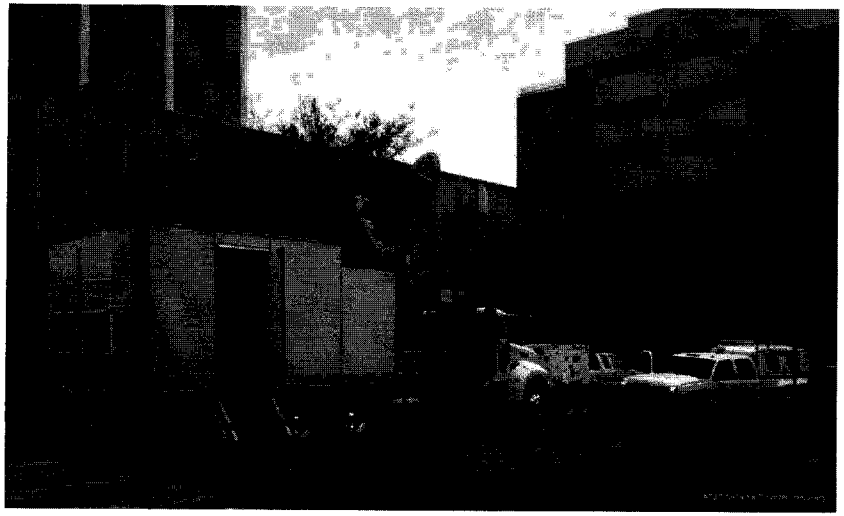
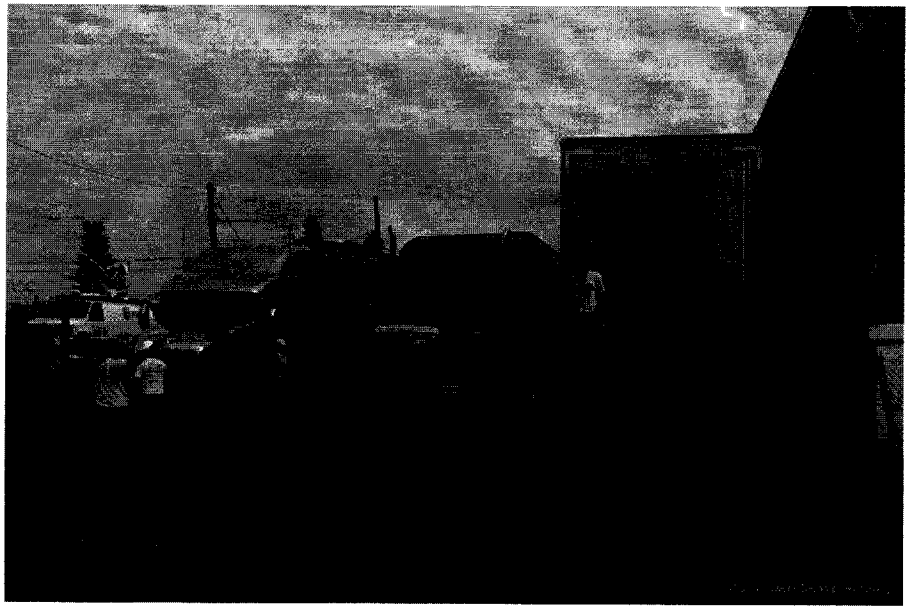
Hurricane Ike— September 2008



Satellite COLT at UTMB Hospital in Galveston, TX



Network office recovery on Galveston Island

Satellite COLT at on the Bolivar Peninsula, east of Galveston Island

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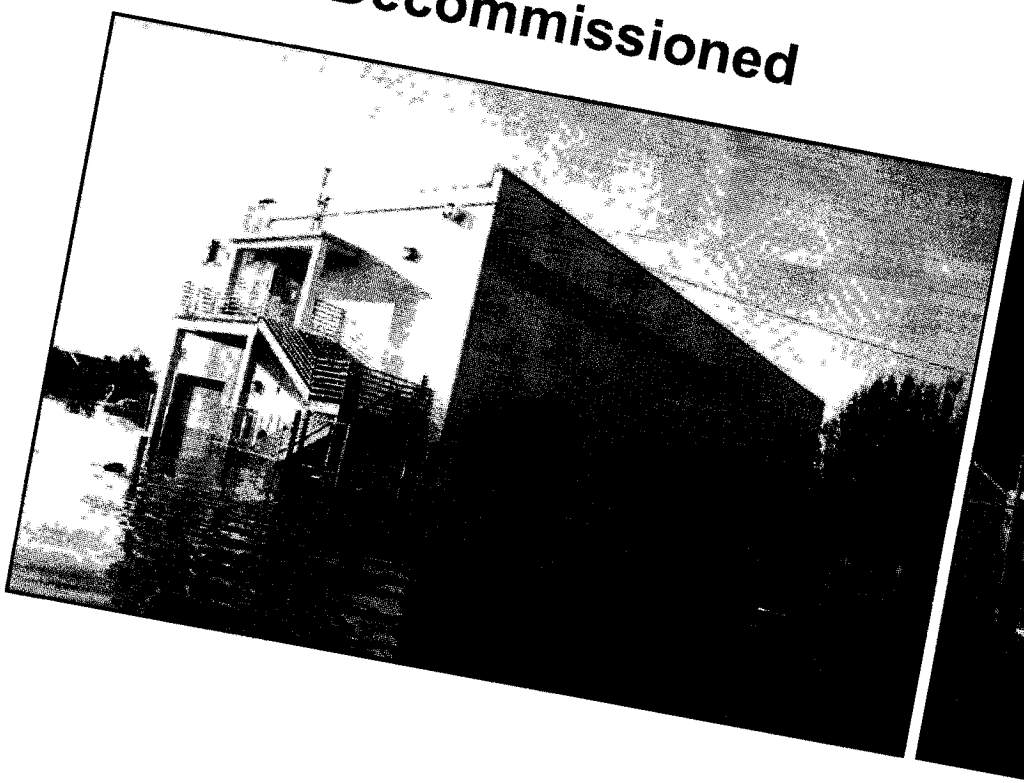
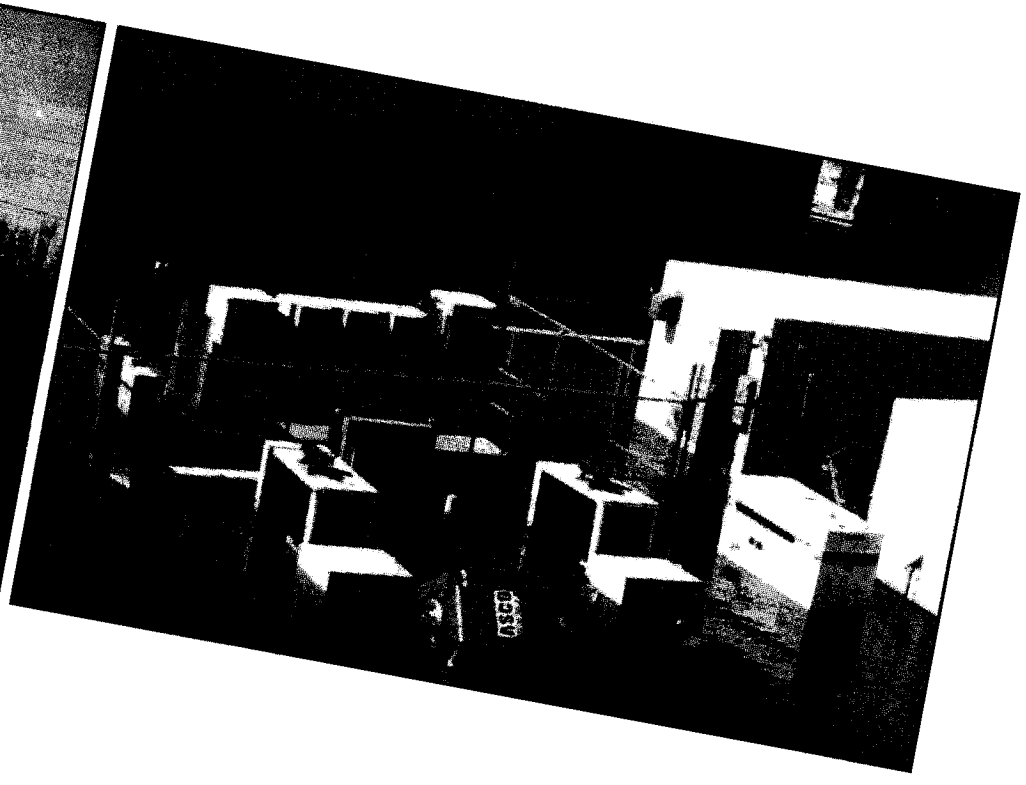
Hurricane Katrina's Local/Wireless Impact – 2005

Switch Decommissioned





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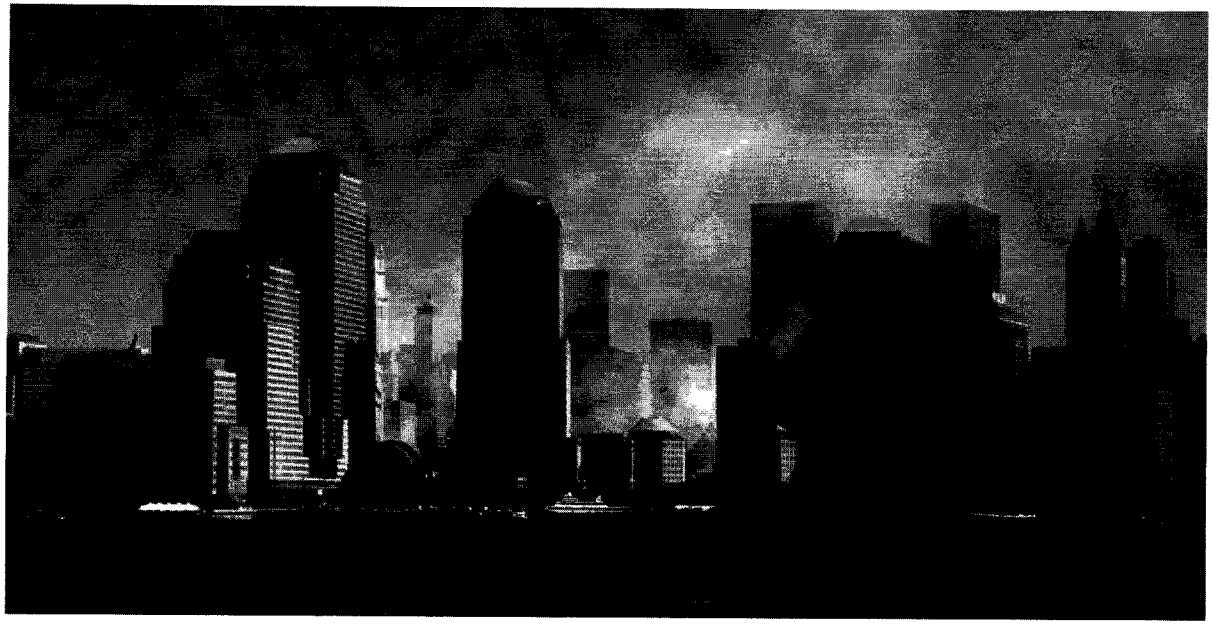
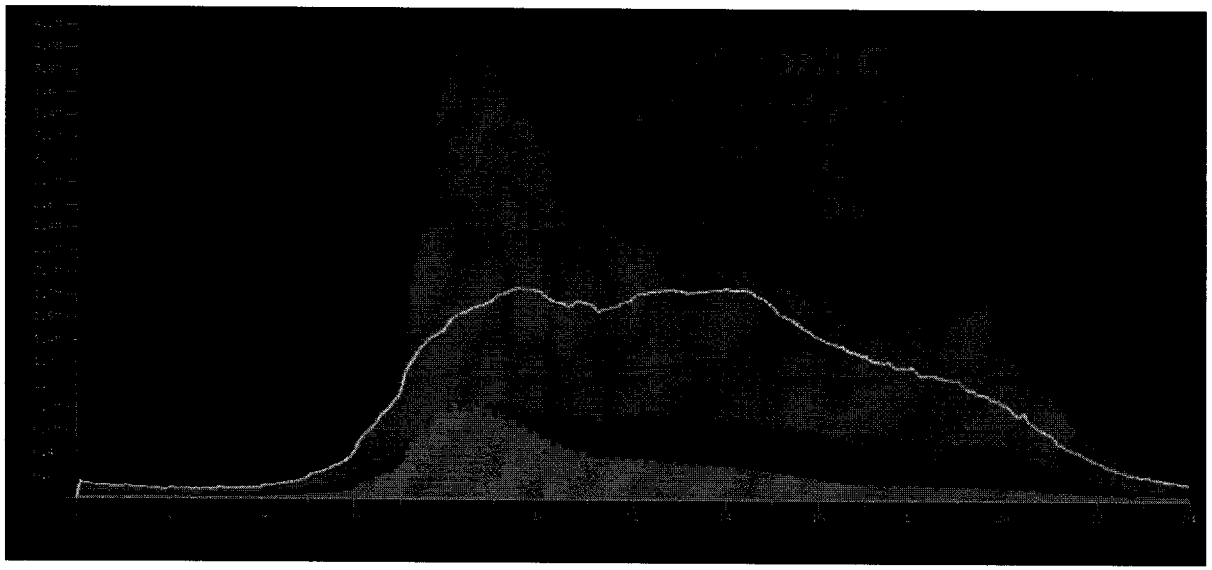
September 11, 2001 — New York City





AT&T transport node in the 6th sub-basement of the World Trade Center's South Tower was totally destroyed

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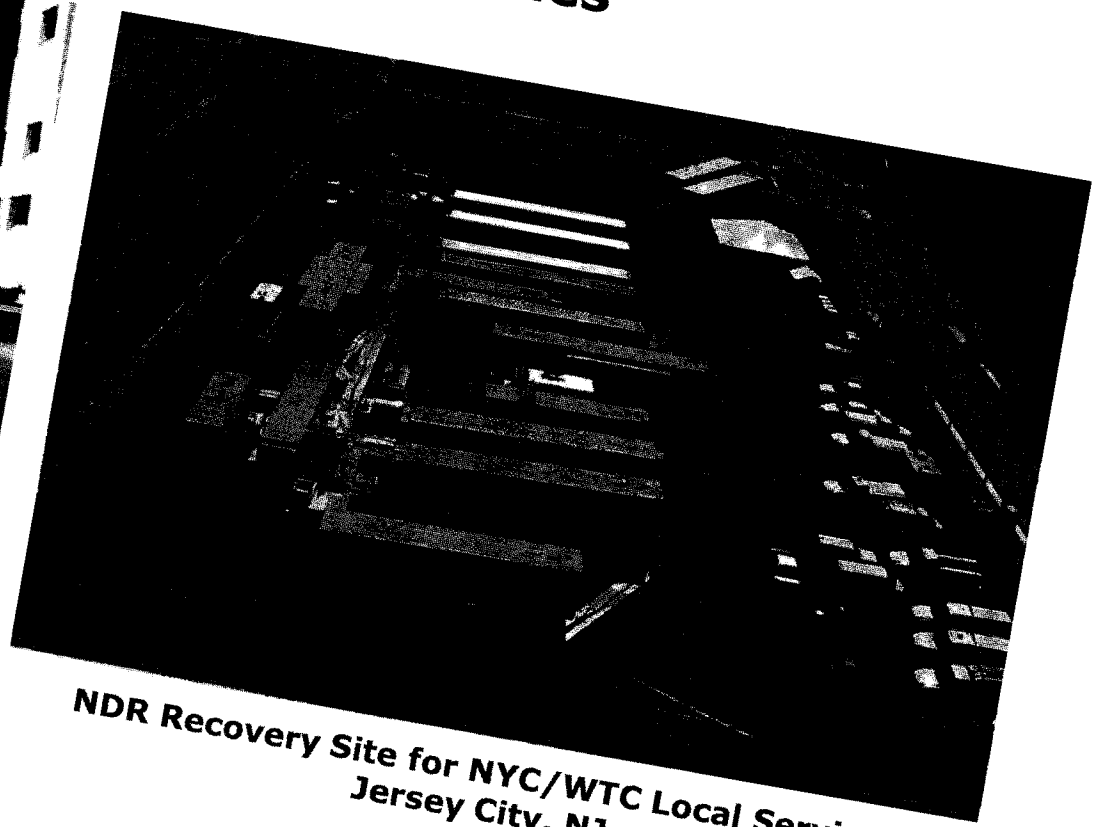
September 11, 2001 — WTC Response

Simultaneous Recovery/Restoration of the Destroyed Office & Support of Authorities

Emergency Communications Vehicle
1 Police Plaza, New York City



NDR Recovery Site for NYC/WTC Local Services
Jersey City, NJ

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AT&T — Always Prepared & Ever Vigilant

Industry Leader

Global Network Scale

Integrated "Shared" NDR Assets

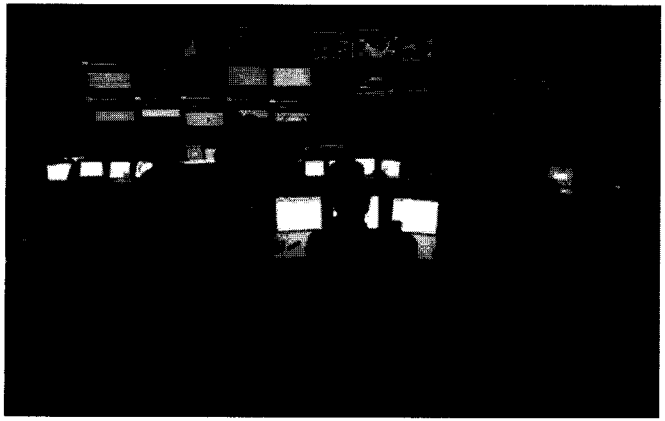
Integrating Operations

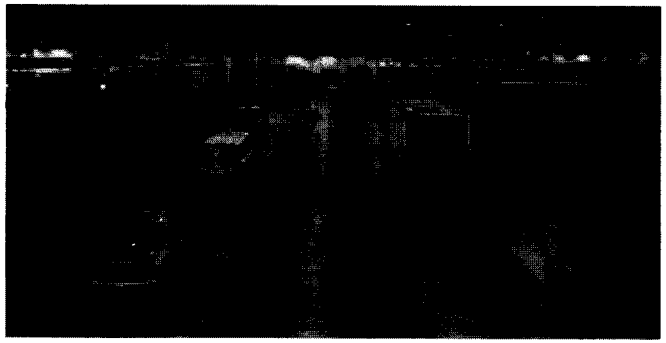
History of Successful Execution

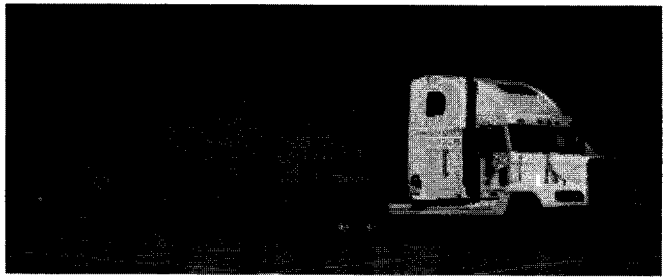
Extended Capabilities

History and Habit of Investment

Unrivaled Talent



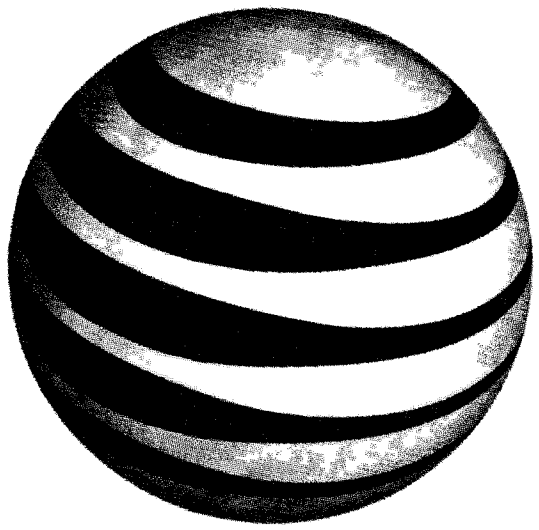




Anytime... Anywhere... Any Event

at&t

Thank You!



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Director, Network Disaster Recovery
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(908) 209-9781 (Cell)
rd6828@att.com

North American Electric Reliability Corporation (NERC) – Critical Infrastructure Protection (CIP)

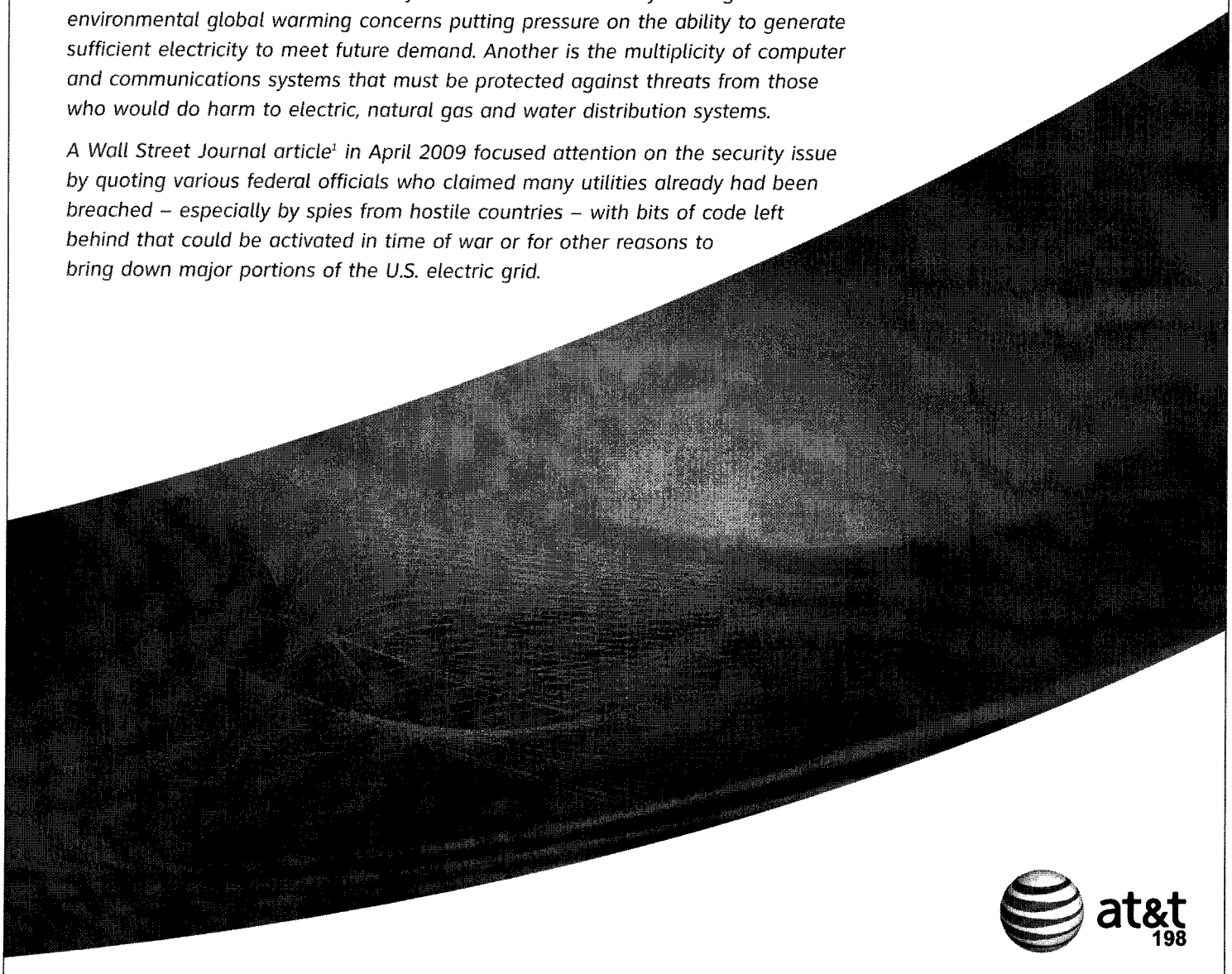
Utilities Facing Many Challenges: Cyber Security is One Area Where Help is Available

Art Maria, Solutions Engineering and Architecture, AT&T
Warren Causey, Sierra Energy Group

Executive Summary

Utilities are in the crosshairs of many forces in the world today. Among these are environmental global warming concerns putting pressure on the ability to generate sufficient electricity to meet future demand. Another is the multiplicity of computer and communications systems that must be protected against threats from those who would do harm to electric, natural gas and water distribution systems.

A Wall Street Journal article[1] in April 2009 focused attention on the security issue by quoting various federal officials who claimed many utilities already had been breached – especially by spies from hostile countries – with bits of code left behind that could be activated in time of war or for other reasons to bring down major portions of the U.S. electric grid.



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