The National Communications System

Ensuring Emergency Preparedness Telecommunications

By Carmin C. Caputo, Louis J. Levy and Llewellyn M. Toulmin, Ph.D.

Alascom mobile satellite equipment provided communications during Hurricane Hugo.

In September 1989, Hurricane Hugo ripped through the Caribbean, crippling telephone communications throughout the region. In Puerto Rico, both commercial and the Pentagon's Automatic Voice Network (AUTOVON) service to the Roosevelt Roads Naval Station was interrupted. Roosevelt Roads provides vital fleet support—including communications, logistics and supplies—to U.S. Naval operations in the Caribbean.

To restore telecommunications, the commander in chief of the Atlantic Fleet requested an air-transportable C-band earth station, a digital end office and a digital wireless local loop system.

The one federal organization created specifically to ensure that a national telecommunications infrastructure is developed which is responsive to such National Security and Emergency Preparedness (NS/EP) needs is the National Communications System (NCS). The NCS flew in an earth station from Alaska and, within three days, Roosevelt Roads was able to process outgoing service calls to the continental United States via the Westar IV satellite to a Public Switched Network (PSN) gateway in Anchorage, AK. The equipment was also used to support recovery operations and provide connectivity between the base and the Federal Aviation Administration (FAA) Regional Center at San Juan, PR.

This is only one example of the vital role played by the NCS, an organization whose purpose includes ensuring that a robust, survivable telecommunications system is available to all organizations with specific national security and emergency preparedness roles during all emergencies. The sections below describe the NCS structure, telecommunications industry participation in major NCS programs, an NCS program of unique interest to corporate disaster planners and NCS plans for the 1990s.

NCS Structure

The NCS was formally established on August 21, 1963 to address inadequacies in the federal government's communications capabilities discovered during the Cuban missile crisis. Its mission, which is distinct from that of the Federal Emergency Management Agency (FEMA), is to provide telecommunications services for the federal government across a full spectrum of emergencies ranging from natural disasters to military conflict. FEMA, by contrast, is charged with coordinating emergency response and recovery efforts on the federal, state and local levels.

Originally, the NCS comprised the telecommunications assets of six federal departments and agencies—the Department of State, the Department of Defense, the FAA, the General Services Administration, the National Aeronautics and Space Administration and the Central Intelligence Agency (CIA). Today there are 23 member organizations (see Figure 1).

These departments and agencies are rep-

resented by two NCS bodies, the Committee of Principals (COP) and its subordinate, the Council of Representatives (COR). Both bodies meet regularly to provide advice and recommendations on a broad range of issues affecting NS/EP telecommunications. These recommendations are then submitted through the NCS executive agent (the secretary of defense) to the Executive Office of the President.

Industry Participation

Because of the federal government's substantial reliance on commercial communications, the provision of emergency telecommunications services would be impossible without the participation of industry. This is why the president's National Security Telecommunications Advisory Committee (NSTAC) and the National Coordinating Center (NCC) were created. The NCC is the arm of the NCS that works closely with industry to coordinate and restore NS/EP telecommunications during natural disasters and other national emergencies.

In 1989 there were over 100 NS/EP invocations. Of these, 29 covered natural disasters such as hurricanes, tornadoes and floods. Another was declared in response to the severe cold wave that froze Alaska last winter. Representatives from 11 major telecommunications firms are on site in the NCC full time and participate in the operations of the NCC's Crisis Coordinating Center. Federal departments and agencies are also represented.

NSTAC is a presidential advisory committee, currently comprised of the chief executive officers from 27 major telecommunications firms, that advises the president on the implementation of national security telecommunications policy from the telecommunications industry point of view. This is particularly important in the post-divestiture era as the number of telecommunications services and providers proliferate. Prior to the breakup of AT&T, the government could rely on a single firm to support its NS/EP requirements as needed.

Measures must now be taken to ensure that interexchange and local carriers, as well as equipment manufacturers, can support government requirements for robust, redundant, survivable telecommunications services. The NSTAC, through its Industry Executive Subcommittee and its composite working groups and task forces, plays a critical role in this area.

NCS National Level Program

A central element of the activities of the NCS is the National Level Program (NLP). This program, developed in 1985 pursuant to a presidential order, is designed to enhance overall NS/EP telecommunications for the federal government. The NLP is composed of three closely integrated component programs: Nationwide Emergency Telecommunications Service (NETS), Commercial Network Survivability (CNS) and Commercial SATCOM Interconnectivity (CSI).

When operational, NETS will provide switched voice telecommunications to NS/EP users through the use of existing switching and transmission facilities, numbering plans and special services such as nonstandard routing and survivable signaling of the PSN.

For example, if the PSN network between New York and Washington were to be disrupted, NETS could permit an NS/EP user in New York to reach Washington via alternate routes not normally available. This nonstandard routing capability will permit emergency personnel at the federal (and possibly the state and local levels) to communicate with one another and speed recovery efforts in the event of an emergency.

The CNS program is implementing interconnects within a commercial carrier network or among multiple networks, thus increasing routing alternatives for NS/EP users. In addition, the CNS program is examining the use of National Guard-owned mobile/transportable telecommunications equipment to augment the PSN. Transportable units were recently tested in an exercise in the state of Washington, in which the transportable assets replaced a portion of PSN services simulated to be lost as a

FIGURE 1

NCS Members

U.S. Department of State
U.S. Department of the Treasury
Department of Defense
Department of Justice
Department of the Interior
U.S. Department of Agriculture
Department of Commerce
Department of Health and Human Service
Department of Transportation
Department of Energy
Department of Veterans Affairs
Central Intelligence Agency
Joint Staff
General Services Administration
U. S. Information Agency
National Aeronautics and Space Administration
Federal Emergency Management Agency
Federal Communications Commission
Nuclear Regulatory Commission
U. S. Postal Service
Federal Reserve System
National Security Agency
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result of a catastrophic earthquake.

The CSI program uses commercial C-band satellite communications capabilities to support long-haul reconstitution of the PSN. The CSI program has two components: earth stations and an Interoperable Telemetry, Tracking and Command (ITT&C) capability. CSI earth stations are connected to the PSN through survivable terrestrial connections.

The ITT&C capability is used to recover and stabilize C-band satellites that may have been orphaned by commercial carriers. CSI assets are tested annually to support NS/EP requirements. A portion of these assets, operating in a different configuration, were recently tested in the Last Mile 1989 exercise in Anchorage, AK.

During this exercise, which simulated the effects of a devastating earthquake in Anchorage and its environs, an air-transportable telecommunications system was used to restore telephone service to NS/EP users throughout the metropolitan area. The local carrier, Alascom, then forwarded traffic to the PSN over a C-band satellite to CSI earth stations in California and Illinois. These capabilities could be extremely useful in the event of a catastrophic earthquake, hurricane or man-made disaster that isolates endangered communities from communications essential to recovery efforts.

TSP: A Key NCS Program for Emergency Planners

Another important NCS program that was developed in concert with the Federal Communications Commission (FCC) is the Telecommunications Service Priority (TSP) effort. TSP establishes a regulatory, administrative and operational framework to authorize priority restoration and provision of NS/EP telecommunications.

In the event of an emergency that disrupts normal telecommunications service, NS/EP users, including federal, state and local agencies with emergency functions, will have their circuits restored and/or provided before non-NS/EP users.

Authorized nongovernmental organizations such as public utilities or major defense contractors and foreign governments may request TSP service to restore or provide essential and emergency communications. This request must be made prior to an emergency.

The nongovernmental organization must be sponsored by the federal government agency for whom they are performing an NS/EP function, obtain an authorization from the NCS and pay a fee to the local telecommunications carrier. NS/EP telecommunications functions are those critical to the maintenance of a state of readiness or the response to and management of any event or crisis which causes or could cause harm to the population, damage property or threaten the security of the United States.

Shared High Frequency Radio Resources For Emergency Telecommunications

Another NCS program that has played a vital role during actual emergencies is SHAred RESources (SHARES). The SHARES High Frequency (HF) radio program brings together the HF radio resources of participating departments and agencies in support of NS/EP requirements.

Currently, over 600 HF radio stations operated by 30 federal organizations in the 50 states, the District of Columbia, Puerto Rico and overseas voluntarily participate in the program. SHARES was successfully used for the first time during Hurricane Hugo. On September 19, 1989, the Department of Veterans Affairs (DVA) in Martinsburg, WV sent the first operational SHARES message, through FAA HF radio stations participating in the SHARES program, to the DVA Medical Center in San Juan, PR. Altogether, over 22 SHARES HF stations representing 10 federal entities were on the air in an ad hoc network, ready to process information to and from the disaster zone.

NCS Through The Next Decade

Through the 1990s and beyond, the NCS will continue to play a critical role in emergency telecommunications planning. As the Cold War recedes, the NCS role in ensuring the development of robust, survivable, national security and emergency preparedness telecommunications throughout a full range of natural disasters on the federal, state and local levels will likely increase. This mission becomes increasingly critical as structural and regulatory changes sweep across the telecommunications landscape.

Of equal importance is the promise held by new technological developments such as Integrated Services Digital Network (ISDN), Open Network Architecture (ONA), digital cellular radio, personal communications networks and low earth orbit satellite. Other issues concern the development and promulgation of standards that will ensure interoperability of communications equipment in the event of an emergency—something that becomes more difficult to achieve as telecommunications equipment and service providers continue to offer a dazzling array of hardware and software.

One thing remains certain: Emergency telecommunications services will be required to ensure prompt rescue, relief and recovery operations during and after a wide range of natural disasters and/or national emergencies. Given the continuing need, the NCS, with its numerous programs and activities, will continue to play a vital role in this area.

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