

Timeline

The following timeline is useful in that it identifies various lessons learned “on the fly” as it provides a chronological sequence of events, beginning with the first request for NPS assistance and ending with the return of the last NPS student/faculty members from MS.

NPS Team Forms

August 31, 2005 – NPS Professor Brian Steckler received a request from FNMOC, Monterey, CA, to assist FNMOC’s sister organization, NAVO, at Stennis Space Station, MS, to get NAVO back online as the two military commands had had only occasional satellite phone communications for the past two days. FNMOC was familiar with NPS’s previous HFN work in Thailand after the December 26, 2004 Southeast Asian tsunami (NPS deployed a similar suite of HFN equipment in the Phuket coast area of Thailand in the days after the tsunami) and knew about NPS’s Nemesis Network Warfare Van (NETWARVAN’s) deployable wireless terrestrial and satellite communications (SATCOM) capabilities. Professor Steckler was also approached by two NPS students, LCDR Bill Bruce and Capt Steve Urrea,¹ who inquired into the possibility of deploying NPS’s HFN to the Gulf as was done for the tsunami and volunteered to deploy in support of the operation. NPS and FNMOC then began intensive coordination with Joint Task Force Katrina’s (JTF Katrina) suborganization, the JFMCC, in order to obtain official tasking/orders to deploy NPS’s SATCOM/802.11 WiFi/802.16 WiMAX equipment suite to the Gulf Coast.

September 1, 2005 (Thursday) – Received an email (a formal request for support) from JFMCC about 1600 hours stating there was a need to deploy NPS’s HFN equipment to assist with hurricane relief in a manner similar to that done in Thailand for tsunami relief.

September 2, 2005 (Friday) – After obtaining NPS leadership authorization to send a team to the Gulf Coast, initial planning began under the direction of Professor Steckler and a request for additional volunteers was sent out to other NPS

¹ Author biographies are in Appendix A of this report.

students. The NPS Katrina Team was formed and equipment was inventoried and staged. The team lost some time planning for possible air lift to get them to MS, but ended up driving most of the personnel and the majority of equipment from CA. Airlift opportunities kept surfacing, but in the end we were bumped by medicine, food, and very important person (VIP) tours such that the team decided to just drive down rather than continuously get bumped on airlift requests. *LL: Communications capability should not be second fiddle to medicine, food, and especially VIP tours.* How can any of these be coordinated without communications on the ground first!?

Advon

Team Departs

September 3, 2005 (Saturday) – The team continued to collect needed materials and prepared to embark equipment. An Advance Team (ADVON) consisting of Professor Steckler, LCDR Bill Bruce, Capt Steve Urrea, and LT Pat Lancaster departed Monterey, CA for the Gulf Coast via Pensacola, Florida (FL) at 1920 hours, via commercial air.

Advon Arr JFMCC

September 4, 2005 (Sunday) – The ADVON arrived at JFMCC Headquarters in Pensacola, FL to brief CDR James Mills, JFMCC J6, on the communications capabilities NPS was bringing and to discuss logistics requirements, chain of command, operational issues, etc. The team was formally given the primary mission to assist the NAVO at Stennis Space Center, MS with restoring data and voice communications. The team arrived at NAVO about 1700 hours and met with the Commanding Officer, CAPT Cousins. They conducted a quick briefing and site survey and agreed to return the next morning. The convoy, consisting of the Nemesis NETWARVAN, a Ryder rental truck, and a personally owned vehicle (POV) for communications, departed NPS around 2000 hours.

Retasked to Hancock

September 5, 2005 (Monday, Labor Day) – Upon arriving at NAVO, the ADVON noticed commercial telephone company employees and a private SATCOM

service provider already working to restore the voice and data communications. Confident the NAVO would soon be fully mission capable, and with CAPT Cousins' concurrence, the JFMCC reassigned the NPS Detachment to provide direct support for the Hancock County, MS, Emergency Operations Center (EOC). The new JFMCC designated mission was to "assist disaster relief efforts along the Gulf of Mexico by installing, operating and maintaining a mobile communications network in areas most devastated by Hurricane Katrina, while maintaining the capability of deploying fly away communication kits to other remote locations." (NPS Daily SITREP, 06 0400Z SEP05). The JFMCC instructed the team to drive to the Hancock County EOC, find the EOC Commander, and offer our services. The ADVON Officer in Charge (OIC), LCDR Bruce, also reported there were numerous areas with very weak, constantly jammed, or no cell phone/satellite phone coverage. Voice communications in and out of the affected area were difficult due to saturation of limited available circuits.

Nemesis Trans brakes down.

ADVON was notified by the team driving from CA that the transmission in the Nemesis NETWARVAN broke down in Kingsman, Arizona (AZ) and that it may take several days for repairs. The rest of the convoy continued their drive and made it to Amarillo, Texas (TX). There were now 4 team members in MS, 7 in TX, and 4 in AZ.\

Hancock Medical Center

September 6, 2005 (Tuesday) – The ADVON met with Mr. Randy Pierce, the acting Communications Director (ESF-2) at the Hancock County EOC, and briefed him on their capabilities. Team members collected information from the EOC on the status of regional communications, where communications and emergency services assets were currently deployed in Hancock County, as well as where the assistance centers and shelters (Points of Distribution (PODs)) were located. Once Mr. Pierce understood the team's capabilities, he tasked them first to provide communications to the Hancock Medical Center (HMC) in Bay St. Louis, MS, which is the largest (and only operational) medical facility in area, and then to return to the EOC for further guidance.

LCDR Bruce reported in the 07 1900Z SEP05 SITREP:

All personnel are quite healthy despite long stressful days. Force protection will be an issue in outer areas due to tensions building among victims w/out water, phones, food, etc. Methamphetamine and other drug infested isolated coastal areas are particularly dangerous as addicts are starting to go through withdrawals and targeting others for money, etc.

He went on to suggest the need for the team to have access to classified military networks to obtain and report force protection intelligence information. The team began to investigate this possibility.

September 7, 2005 (Wednesday) – En route to conduct the site survey at HMC, the ADVON noticed that the Hancock County Sheriff's Department had established an ad hoc EOC in the parking lot of the Waveland, MS Wal-Mart on Interstate 90. They stopped to survey what communications equipment this EOC had and agreed to attempt to augment communications capabilities once the mission at the hospital was accomplished. The sheriff already had a low bandwidth satellite link that was being provided by a team of first responders from Polk County, FL, but this link was only for first responders, not the general public, NGOs, or other agencies in the Wal-Mart parking lot. The Communications Team lead from Polk County was Mr. Ben Holycross, who agreed to allow the connection of a wireless access point (Rajant Breadcrumb temporarily until Cisco Sky Captain gear became available) to his satellite feed, which, in turn, provided a public (wide open access) wireless hotspot.

The ADVON arrived at HMC and conducted a hasty site survey. The first floor of the hospital was completely destroyed and its entire information technology (IT) infrastructure was absolutely devastated. A nearby sewage treatment plant and separate chemical treatment plant were inundated by the storm surge, resulting in significant contamination of the hospital's ground floor and rendering it almost completely off limits. However, commercial power (via generators) was slowly being restored. Several entities were already operating out of the parking lot of this hospital site including (but not limited to): FEMA, the Federal Protective Service (FPS), a Disaster Medical Assistance Team (DMAT) (Missouri (MO)), FEMA DMAT (FL), an Air National Guard Expeditionary Medical Support (EMEDS) field hospital, a Disaster Mortuary Operational Response Team (DMORT) (mortuary services), the Gulf Coast Ambulance Service, the

American Medical Response, and MS National Guard security units. After some initial difficulties repeatedly having to convince the FEMA Operations Commander on scene of our legitimacy, that we were deployed under the JTF/JFMCC to support/augment communications in the area, and that we would not be charging fees for our services, NPS ADVON personnel began intensive coordination to integrate their personnel and equipment into the operation.

ADVON also identified a multitude of communications requirements they would not be able to satisfy, even after all their equipment arrived from CA. Professor Steckler held a conference call with OASD-NII and others to report on the situation and shortfalls. Professor Steckler also heard that the City of Monterey was considering “adopting” Bay St. Louis and Waveland due to the close ties between FNMOC and NAVO.

September 8, 2005 (Thursday) – ADVON completed the site survey at HMC and conducted a driving survey of the locations of some of the shelters and emergency support centers in Bay St. Louis and Waveland. The team members stranded in AZ reported that Nemesis had been repaired and was on the road again. About 1630 hours, the 7-member team arrived at HMC from TX with two rental RVs for lodging and the Ryder truck full of equipment. They immediately began installation of the Tachyon satellite dish and receiver equipment as well as wireless access points. Within five hours of the equipment arriving, the team had the network up and operating at HMC, providing 512KB uplink and 2MB downlink and a wireless cloud that serviced all agencies in and around HMC. Initial capabilities brought to bear to support all agencies operating out of the hospital parking lot included Internet connectivity, email, and VoIP phone capability with dial capability anywhere in the Continental United States (CONUS), courtesy of a Cisco provided tie-in to their Raleigh, North Carolina (NC) Call Manager system that was set up specifically for Katrina. Immediate users included HMC’s leadership, FEMA, DMAT, the Air National Guard, FPS, the American Medical Response Ambulance Service, and miscellaneous emergency responders operating out of the parking lot, as well as the NPS Team and an occasional hospital patient. The first electronic SITREP was transmitted on 08 1900Z SEP05.

The team members did a great job getting the network up as quickly as possible. The team also reported success in building relationships with FEMA and the local city authorities. Professor Steckler provided an update to OSD, who subsequently indicated that they planned to send CDR Eric Rasmussen to MS as an observer in the next few days. Professor Steckler reported in the first SITREP there was still a need for access to classified networks—primarily to obtain critical force protection intelligence information as his teams were deploying out in the community to create network WiFi hotspots/clouds without escort and without weapons. In addition, the team had hazardous material (HAZMAT) concerns since the HMC experienced significant chemical spillage and moreover, raw sewage from a nearby sewage treatment plant that had been forced into the hospital by the storm surge.

September 9, 2005 (Friday) – The network installation phase began in earnest when the team split duties and began site surveys at prioritized locations outside HMC. Meanwhile, a portion of the team established the NOC in an old lounge on the first floor of the HMC, clearing away debris, broken glass, etc. Additionally, Nemesis arrived at HMC. All NPS personnel and equipment were now on-site.

Civil-military boundary challenges continued due to a lack of coordination between the EOC at Stennis, FEMA, and FPS, which was providing security at HMC. LCDR Bruce reported in the daily SITREP:

Force protection of site on hospital campus is becoming an issue. FEMA security officials only have enough temporary fencing to contain FEMA site and Air National Guard field hospital on [HMC] campus, leaving us exposed to open access on campus. Working with JFMCC Pensacola to determine requisition route, JFMCC or local EOC/FEMA, to obtain more fencing to enclose our site.

The team was then informed that an ad hoc volunteer networking group from San Jose, CA was beginning to arrive, providing over 100 personnel and additional communications equipment to assist in the recovery of communications capabilities.

September 10, 2005 (Saturday) – Two additional sites were brought online: the Bay St. Louis 2nd Street Elementary School (a hastily formed shelter) and the

Bay St. Louis Fire Station. Both locations were connected with Redline 802.16 links from HMC and provided VoIP phones and laptops for Internet access so local citizens could finally make their very first call to loved ones and attempt to file the necessary nine-page online claims with FEMA. The plan was then to configure Nemesis as a mobile network node.

The team was able to overcome force protection concerns by arranging with the FEMA Operations Commander on-site to relocate from its initial location outside of the security perimeter established by FEMA to an area within the security perimeter vacated by a departing DMAT unit. Civil-military coordination became easier as all players started to get on the same page. This day's SITREP stated "many agencies and commands have great intentions but C2 is a must in this environment." The Air National Guard medical unit graciously offered use of their mess facility to NPS personnel.

Commercial vendor representatives began arriving to help support the NPS-led HFN installation operations and maintenance. Ryan Hale and John Taylor from Mercury Data Systems (network technician and CEO), Jim Washington and Barry McElroy from Rajant Corporation (wireless 802.11 Breadcrumb mesh technicians), and Don Mullen and Dave Rumore from Redline Communications (802.16 technicians) arrived.

We quickly realized that the communications requirements were quickly exceeding the capabilities being provided by the NPS HFN. The team expected the current 2Mbps/512Kbps single pipe to quickly become saturated and reported that there was still a dire need for more SATCOM service. Professor Steckler asked OASD-NII for possible assistance with more SATCOM pipes and began to consider implementing Acceptable Use Policies (AUPs) to try to control users sending large videos or pictures out to relatives or colleagues from the network.

September 11, 2005 (Sunday) – The Wal-Mart POD was converted into a wireless hotspot by connecting a Breadcrumb wireless mesh access point to the satellite feed already on-site being provided by Polk County first responders.

From the daily SITREP, user demand greatly outnumbered available end-user equipment (e.g., laptops and VoIP phones). A limited number of assets (20 laptops and

4 VoIP phones) couldn't support the "approximately 100+ AIR/ARMY National Guard members, 50 FEMA personnel and over 3,000+ (to date) civilians affected by Katrina, the mayor and numerous other local emergency personnel."

A second Tachyon satellite dish, which had been shipped at the beginning of the evolution, was finally received, but it was missing some parts, thereby causing a delay in installation (expect missing parts in a few days).

September 12, 2005 (Monday) – The HFN was further expanded by extending a WiMAX 802.16 link to the Waveland Police Department (PD). The NPS Team also received shipment of additional Redline 802.16 link and Cisco Sky Captain prototype wireless mesh equipment. A Cisco Technical Support Team was to arrive early on Tuesday, 13 September, to assist with installation.

Hurricane survivors began to really benefit from the HFN as the lines of callers grew at the 2nd Street Shelter to use the VoIP phones to call loved ones and at the laptops to register for aid from FEMA. At other locations, NGO personnel began accessing the HFN with their own organic WiFi-enabled equipment.

CDR Pete Griffiths (OASD-NII) observer sent from Pentagon arrived. See Appendix B for CDR Griffiths' SITREPs submitted to the Pentagon.

September 13, 2005 (Tuesday) – The HFN covered approximately 4 square miles. The team began to experience some technical performance issues with the HFN equipment. The Breadcrumbs needed Dynamic Host Configuration Protocol (DHCP) disabled if routers on the network had DHCP enabled.

Civil-military boundary issues continued to improve as we coordinated with many NGOs to provide wireless connectivity with as few incompatibilities between communications gear as possible, while enabling the greatest possible volume of traffic over each entity's bandwidth. However, network installation time increased as we awaited lift truck availability to install 802.16 links above the tree line.

Two contractors departed for New Orleans and Dave Rumore, Redline contractor, departed today. Two Cisco technicians arrived late today to assist with installing the new prototype Cisco Sky Captain wireless mesh equipment.

September 14-16, 2005 – Long-awaited Tachyon parts arrived, but we still didn't have everything we needed (only received one of the two boxes of parts). The team continued to try to bring up the 802.16 link to Waveland PD; they experienced difficulty due to lack of elevation and dense foliage preventing a clear line of sight (LOS) link. The team was able to coordinate use of a satellite link in the Wal-Mart parking lot (provided by Polk County, FL first responders) as the source of the 802.16 link for Waveland PD (far fewer blockages in LOS path). We had reached our limit on available equipment at this point, but were continuing to work with other communications providers to expand the network and its capabilities. This illustrates how critical the sharing of resources was in this environment. Equally vital was the need to have someone collect and prioritize requirements and assign assets.

The footprint of units at HMC was shrinking. All DMAT and FEMA/FPS personnel began pulling out, along with their shower/sink capability that the NPS Team was using. This complicated the logistics/hygiene issue for the team in the midst of personnel transition and network operations and maintenance (O&M). Luckily, FEMA agreed to allow the NPS Team to use the two travel trailers they left behind. This helped the shower/sink and berthing issue greatly.

The Bay St. Louis 2nd Street Elementary School Shelter is operational despite missing one Breadcrumb. The Red Cross inadvertently took down a Very High Frequency (VHF) radio mast to which the Breadcrumb was attached. The NPS Team was able to retrieve the equipment on 15 September.

Local NGOs expressed an interest in not only the capability to communicate via HFNs, but also in a software package or application that would facilitate a common operational picture.

The initial team of NPS students prepared to return to Monterey, to be replaced by a much smaller contingent of students, as well as some Naval Reservists, in the next few days. LCDR Bruce and Professor Steckler began working with NPS leadership and the JFMCC on an exit strategy to ensure that the network would remain operational through at least the end of September. The outgoing team began preparing pass-down information.

September 17-18, 2005 – The missing box of Tachyon parts finally arrived and the team began the second suite of SATCOM gear installation at the Waveland PD location. They had to improvise by locally procuring some hardware to complete the assembly and mounting and had some difficulty finding a suitable location for the antenna. Eventually, the team found a good location and brought the equipment online, freeing up a set of 802.16 antennas to be used for the next priority awaiting fulfillment.

Cisco technicians succeeded in installing their new proprietary 802.11a/b/g “Sky Captain” wireless mesh technology at the POD across from the Waveland PD. The team also added another node to support the 223rd Engineering Battalion Detachment (about 450 National Guard personnel) working in Bay St. Louis. The team began looking at creative ways to improve and expand the wireless network as well as to add network security and monitoring/management capabilities.

Two engineers (Karen Easterbrook and Adam Sepak) from Microsoft arrived unannounced/unexpected, but were very welcome to discuss their new Wireless Mesh Incubation technology (Venice) with Professor Steckler and CDR Griffiths. Discussions continued as to how Microsoft might best support the relief efforts.

JFMCC J6 informed the team that all support functions would be turned over to civil authorities by 27-30 September, including the network support that the NPS Team was providing to Bay St. Louis and Waveland users. A great deal of coordination would be required for this to happen without adversely affecting services and to ensure proper turnover and accounting if equipment were to be left in place.

The team helped the local community in many other ways beyond the technology provided. The following is an extract from the daily SITREP dated 19 0200Z SEP05:

WHEN THE DET PROVIDED SERVICE TO THE SECOND STREET ELEMENTARY SCHOOL, RELATIONSHIPS WERE FORMED WITH THE FOUNDERS OF THE UNOFFICIAL, TURNED OFFICIAL, POINT OF DISTRIBUTION (POD). ONE IN PARTICULAR WANTED TO RELOCATE TO WEST PALM BEACH, FL, BUT DID NOT HAVE THE FUNDS TO MAKE SUCH TRAVEL, NOR DID HER FRIEND WHO SHE WANTED TO VISIT IN WEST PALM BEACH. ONE OF THE DET MEMBERS THEN MADE A COUPLE OF PHONE CALLS TO THE AIRLINES AND WAS ABLE TO ARRANGE FOR A FREE FLIGHT. THE CEO OF ANGEL FLIGHT GOT WIND OF THIS AND DECIDED TO REALLY CHANGE HER LIFE. THE CEO

CONTACTED A DET MEMBER AND TOLD THE DET MEMBER TO TAKE HER TO STENNIS AIRPORT AT A PARTICULAR TIME TO MEET HIM ON HIS PRIVATE PLANE FOR A ONE WAY TRIP TO WEST PALM BEACH. WE ARE HAPPY TO REPORT THAT SHE MADE THAT FLIGHT AND WILL BEGIN WORK AT THE WEST PALM BEACH AIRPORT AND THUS LIVE MORE COMFORTABLY THAN WHEN SHE WAS SLEEPING IN THE OPEN FIELD ACROSS THE STREET FROM SECOND STREET ELEMENTARY SCHOOL IN BAY ST LOUIS. THIS ALL HAPPENED BECAUSE THE DET CARED ABOUT ITS MISSION TO HELP THE CITIZENS AFFECTED BY HURRICANE KATRINA.

September 19, 2005 (Monday) – The team continued to operate and maintain the network with nodes established at HMC (NOC), Bay St. Louis Fire Department, 2nd Street Elementary School, and the 223rd Engineer Battalion in Bay St. Louis, as well as the Waveland PD and Fred's Department Store POD in Waveland. They also established a video-teleconference (VTC) connection with the Wireless Warfare Lab at NPS and a backup VTC (via VSee Internet-based videoconferencing technology) using a Web camera. Both VTCs were working in the NOC at HMC.

Preparations began to weatherize all gear due to Tropical Storm Rita brewing in the Gulf of Mexico. Team members also worked to document the equipment locations to further prepare for eventual turnover to a contractor or civil authorities.

Civil-military relations were good, with much coordination between the EOC, the JFMCC, and the NPS Team following the order for departure NLT 30 September. The SITREP dated 20 0230Z SEP05 read:

EOC LEADERSHIP VOICED THE CONCERN TO MS STATE FEMA/MEMA LEADERSHIP THAT CRITICAL C2 COMMS WOULD BE TAKEN AWAY TOO SOON. THE ORDER TO DEPART WAS RESCINDED (APPARENTLY BY THE GOVERNOR'S OFFICE), AND NPS DET HAS NOW BEEN AUTHORIZED TO STAY UNTIL OUTSIDE SERVICES ARE BROUGHT IN TO PROVIDE THE SAME COMMS THAT DET IS PROVIDING, OR UNTIL THE STATE DEEMS THE SUPPORT IS NO LONGER WARRANTED. JFMCC GUIDANCE IS THAT THIS MUST HAPPEN BY 27 SEP.

September 20, 2005 (Tuesday) – Detachment OIC (LCDR Bruce) and the remaining original group of NPS students departed this morning. The NPS-led team's focus was now to maintain services at all locations and prepare for eventual turnover of

the network to civil authorities. LCDR Chris Gaucher (USNR) arrived this evening to take over as OIC.

Rita was upgraded from a tropical storm to a hurricane and we began to watch it very closely. The team has weatherized all vehicles and as much equipment as possible and began awaiting guidance from JFMCC J6 on when or if evacuation order will be given.

Civil-military boundary: Transition planning continues. The Hancock County EOC Commander voiced concern to MS state leadership that the NPS network provides critical C2 capability and must remain in place, or be replaced in kind before being removed. The team provided recently completed network documentation to JFMCC J6 and the EOC to assist in identifying resources to take over infrastructure. SITREP dated 21 0530Z SEP 05 read:

DOCUMENTATION WILL BE USED TO ASSIST THE MISSISSIPPI EMERGENCY MANAGEMENT AUTHORITY (MEMA) IN APPLYING FOR STATE FUNDED INFRASTRUCTURE SUPPORT IN THE FUTURE WHEN THE NPS DET DEPARTS FROM THE AREA.

September 21, 2005 (Wednesday) – Long days and lots of work as we continued to shrink the size of the team and prepare for possible evacuation due to Hurricane Rita. Our main effort was to maintain the network services and prepare an exit strategy to meet the JFMCC-mandated 30 September 2005 departure date. The team had to be careful at this point to avoid mission creep, as we were constantly being bombarded with requests from nearby communities that were still dark to set up similar infrastructure in their communities. As time permitted, the team continued to improve services in Bay St. Louis and Waveland. Skype Technologies donated 100 vouchers for 250 minutes (each) of free international calling. A team member began investigating the process to configure and load it on a test platform to determine procedure for widespread distribution of donated vouchers.

As reported in the early days of this effort, cell phone coverage continues to be spotty and all circuits are routinely overloaded. Professor Steckler stumbled onto a previously unknown capability to address this issue as reported in the SITREP dated 22 0630Z SEP05:

UPON CALLING ATT'S 611 NUMBER TO ASK IF THERE WAS ANY WAY TO IMPROVE THE CONSTANT BUSY SIGNALS FOR CALLS AND VOICE MAIL ACCESS, HE WAS GIVEN THE PHONE NUMBER OF THE DEPT OF HOMELAND SECURITY GOV'T EMERGENCY TELEPHONE SERVICE [GETS] SYSTEM AND THE WIRELESS PRIORITY SERVICE [WPS]. LONG PROCESS BUT IT ALLOWS CERTAIN GOV'T PERSONNEL TO HAVE PRIORITY SERVICE FOR LAND LINE AND CELL PHONE ACCESS INCLUDING VX MAIL ACCESS. HE WAS UNABLE TO ACCESS VX MAIL ALL DAY, WITH 17 VOICE MAILS PENDING. FACULTY LEAD WAS GIVEN AN ACCT AND THE PROGRAM OFFERED MORE ACCOUNTS IF NECESSARY.

This is referring to the Government Emergency Telephone System (GETS) and the Wireless Priority Service (WPS). Information on these two DHS-run programs will be provided to appropriate personnel upon request. The GETS and WPS programs allow qualified emergency early responders to obtain priority service for plain old telephone service (POTS) and cell phone service.

The team continued to help in ways beyond just technical assistance. One team member noted a bio-hazard situation (rotten meat at the Pearlington, MS POD) and reported it to the FEMA/Mississippi Emergency Management Agency (MEMA) safety officers for further action.

September 22, 2005 (Thursday) – Main effort continued to be maintaining the network services and preparing for Hurricane Rita's effects. The team removed equipment from the Fred's POD location in anticipation of inclement weather. The Waveland PD was still up and users could access the wireless cloud from the area just across the street.

An Associated Press reporter and photographer arrived and captured an action shot of the team moving an antenna atop HMC. Both the OIC and faculty lead were unavailable, so the reporter documented the names and hometowns of those in the photo.

The new Assistant OIC (AOIC) (NPS student Maj Bryan Bradford, USAF) continued to work on the transition strategy. Current issue was maintaining network services as long as possible, while preparing to hand over the network to contractors and/or civil authorities. We provided a point paper (see Appendix C) via JFMCC J6 to the JTF Katrina Defense Coordinating Element (DCE) Officer explaining our mission

and current network architecture. Apparently, there was a slight disconnect between the JFMCC and JFT Katrina regarding the JTF's knowledge of the NPS Teams' presence and the services being provided by them.

September 23, 2005 (Friday) – Hurricane Rita had us pinned down all day. While we were not in the direct path of the storm, the constant tornado watches and warnings and high winds she was generating kept our movements to a minimum. The team was unable to make their daily rounds due to tornado warnings in lower Hancock County, so the operational status of network nodes could not be determined. Remote network monitoring had not yet been installed on the network.

Transition planning was still progressing. One additional Naval Reservist, standing by in FL, was told to delay his arrival until the storm passed. All NPS students were to return to Monterey, CA NLT 25 September 2005. However, Maj Bradford volunteered to stay and received approval from the NPS Chief of Staff and his Department Chair to remain until 30 September 2005. Inclement weather cost us valuable time in preparing for turn over.

The Team OIC received an important medical advisory from the DCE outlining mandatory actions for all personnel deployed in support of this effort. A medical post-deployment form was provided to the team and forwarded to all personnel who had already departed the area. *LL: Medical post-deployment forms are another of several items that team members need to know ahead of time when possible.* Recommend future event planning include weather as well as medical information as several members of the team had never been in areas subject to tornados and were unfamiliar with tornado evasion, weatherizing equipment, etc.

The faculty lead received an email today as detailed in the 24 0430Z SEP05 SITREP:

Hi Brian,

I am a member of PA3 DMAT. We met during our short stay at Hancock Memorial in Bay St. Louis. I wanted to thank you for the invaluable services you provided the team in the way of Internet and phone connectivity. I know that as much as we appreciated it, the service you provided the community there was appreciated much more as they cannot expect those services restored for some weeks yet. With teams

such as yours able to quickly provide connectivity in areas such as we were in where so much infrastructure was destroyed with no hope of quick restoration, communities and governments can quickly re-establish communications so vital to recovery.

I hope your program continues to flourish and is given serious consideration as being part of a formal first response to stricken areas of any disaster.

I'm home now and enjoying those things we all take for granted. I hope you guys solved the shower/sanitation problems created when we were ordered out. Maybe someday the mechanisms will be in place where different agencies can work more closely together without all the red tape. Good luck and stay safe,

George Klinzing, PA3 DMAT Erie, PA

This is another example of how the team touched the lives of many people, not just those who survived Hurricane Katrina, but also those who came to help. This contact has led to further discussions (ongoing) with the PA3 Detachment about future HA/DR collaboration with NPS.

September 24, 2005 (Saturday) – Hurricane Rita spared us a direct hit, but we could not return to normal operations yet. Other than high winds, weather was not an issue, but we were awaiting a location (out of the weather) to reinstall the equipment for Fred's POD.

Civil-military boundary: Terry Knight, the contracting officer from FEMA, called Professor Steckler to discuss necessary items and personnel to take over the network. He wanted to discuss the transfer of equipment and skill sets needed to keep the network running.

Cisco technicians called to see what help we needed. We suggested an additional router, power supplies for VoIP phones, extended life VoIP phone batteries and additional CAT-5 cable to help improve connectivity for additional VoIP phones at the 223rd Engineer Battalion location. *LL: Stock/included batteries for the Cisco 7920 VoIP phones last only an hour at most—versus three-hour optional long life batteries.*

Faculty lead departed tonight, and all NPS students but one are to leave the next day. That brought the Detachment personnel count down to only 6 (2 officers and 4 enlisted technicians). The OIC stated in the SITREP dated 25 0430Z SEP05:

CONCERN THAT THIS SMALL TEAM WILL HAVE DIFFICULTY CONTINUING TO MAINTAIN THIS FRAGILE HFN UNTIL EXPECTED TURNOVER TO CIVIL AUTHORITIES OR FEMA CONTRACTED VENDOR/S.

To further complicate things, personnel replacements at the Defense Coordination Office (DCO) in Jackson, MS forced us to brief our situation again to a new group of DCO personnel. CAPT Dave Picou, USN, replaced CAPT Lawing and we provided him with all the relevant information to bring him up to speed. LCDR Gaucher told him the local authorities were vitally interested in, and virtually dependent on, someone maintaining the current network as well as increasing capability to areas throughout northern Hancock County. We were told to expect a contract award “this weekend” for replacement personnel to take over operations before the end of the coming week (SITREP 25 0430Z SEP05).

September 25, 2005 (Sunday) – Our main effort was focused on maintaining the network and continuing to plan for transition—we had officially transitioned from “create” to “sustain” mode with respect to the network. Our team was at its smallest size (6 personnel) and we were working to continue daily rounds to all the sites as well as preparing to transition the network to whoever wins the FEMA contract. In addition, we began to have errors with some of the Breadcrumbs (traced to battery problems) and started replacing them with Cisco Sky Captain (or similar) wireless access points (APs). On a positive note, the team received some welcomed help in the form of a Cisco technician (Chris Verges). Chris quickly jumped in and during the daily rounds began helping look for ways to improve the current network. Chris and all the technicians from Cisco have been a great help.

In the absence of firm information, we planned numerous options for redeployment of personnel and vehicles. All of these options assumed the network equipment currently in place would remain behind. We coordinated with local military authorities at Stennis Space Station to park the Nemesis vehicle and Ryder truck there for an undetermined amount of time until NPS faculty or staff can retrieve them. Four personnel (Maj Bradford and three Reservists) planned to drive the two RVs back to Dallas, unless the Contractor Team wanted to take them over.

We received word from the DCO's office (LTC Wyrick) that contractor relief would be expected on Tuesday or Wednesday of this week. Details of the contract were being worked out for the relief to be in place and ready to operate the network before our scheduled 30 September departure.

The Air Guard EMEDS Team returned from the voluntary evacuation due to Hurricane Rita with the full security detachment. This was good news for the NPS Team that decided to weather out Rita at the Hospital/NOC with little to no force protection.

September 26, 2005 (Monday) – Our main effort was focused on continuing to maintain the network and planning for transition. We learned the hard lesson that HFNs that are hastily maintained need to have some of the equipment replaced after a period of approximately 14 days. In this vein, Breadcrumbs seem to be a good short-term solution, but did not meet the test for long deployment in an HFN.

Our transition plan was firming up; the plan was:

1. Tuesday: replace more equipment in the network.
2. Wednesday: park Nemesis and the Ryder truck at NAVO Stennis and begin turnover with the Contractor Team.
3. Thursday: two team members remain to continue turn over and four members begin driving two RVs back to Dallas to return to RV leasing company.
4. Friday: turnover between NPS Team and contractor personnel would be complete and all team members return to home station.
5. Return rental cars.

This still assumed the contractors would take over existing network equipment.

Civil-military boundary: The OIC received a call from an Associated Press reporter asking about people our services have helped. He passed on to the reporter the phone numbers for the Waveland PD and Mayor, and the Bay St. Louis Fire Chief and Mayor. He also notified the Deputy DCO. Another good news story also occurred today.

As reported by LCDR Gaucher in the SITREP dated 27 0430Z SEP05:

AFTER FINDING OUT LAST WEEK THAT THE BAY ST. LOUIS
MAYOR HAD BOTH OF HIS PERSONAL AND OFFICE
COMPUTERS DAMAGED BY FLOODING DURING THE

HURRICANE, THE TEAM CONFIGURED TWO LAPTOPS FOR CITY MANAGEMENT USE AND PRESENTED THEM TO HIM TODAY....HE WAS QUITE OVERWHELMED AND THANKFUL FOR OUR GENEROSITY. A VERY EMOTIONAL EXPERIENCE... TWO TEAM MEMBERS FROM CISCO PRESENTED HIM A CISCO HAT AND A COUPLE OF CISCO GOLF SHIRTS WHICH WERE ALSO WELL RECEIVED SINCE THE MAYOR HAD LITTLE MORE THAN THE CLOTHES ON HIS BACK WHEN THE HURRICANE HIT. I ALSO HAD THE OPPORTUNITY TO WALK AROUND THE FIRE HOUSE AND MEET WITH THE FIRE CHIEF AND A NUMBER OF VOLUNTEER FIREFIGHTERS FROM OTHER PARTS OF THE STATE AND COUNTRY. IMPRESSIVE TO SEE THE DEDICATION FIREFIGHTERS HAVE TO ONE ANOTHER EVEN FROM DIFFERENT PARTS OF THE COUNTRY. THEY HAD COME TO RELIEVE THEIR COLLEAGUES FROM DUTY, MANY OF WHOM HAD LOST THEIR OWN HOMES. I MET SOME FROM SAN DIEGO, CALIFORNIA; FAIRFAX, VIRGINIA; COLUMBIA, SOUTH CAROLINA; AND VICKSBURG, MS. OVERALL A GOOD DAY....WONDERFUL PEOPLE HERE WHO ARE ALL WELL DESERVING AND EQUALLY GRATEFUL FOR EVERYTHING WE ARE DOING FOR THEM....GREAT FEELING TO BE HELPING AMERICANS ON AMERICAN SOIL.

These are further examples of how everyone has pitched in to help their fellow citizens in this time of need.

September 27, 2005 (Tuesday) – Our main effort was focused on preparing for transition, while also maintaining the network. We found out a contract was awarded and the replacement personnel should begin arriving on Wednesday, 28 September. Therefore, we decided to execute the plan reported the previous day and began making preparations to do so with one modification. CTN1 Mollere (USNR), one of the Navy Reserve team members who had relatives in Waveland, decided to extend his reserve time. If the details could be worked out with his command, he would depart as planned on 30 September and return on 1 October to begin his reserve drill time. We also encountered a small hurdle in preparing for the return of the RVs. The Reservists required amended orders to permit them to drive to Dallas and fly home from there. We began working this issue vigorously.

In accordance with our transition plan, the team returned two rental cars to Gulfport and enjoyed a well-earned meal in a “sit down” restaurant for the first time since arriving.

Civil-military boundary: Maj Bradford contacted FEMA regarding the disposition of the two travel trailers the team had been using since FEMA departed the area. FEMA granted an extension of at least two weeks and agreed to allow HMC personnel to use the trailers as living quarters for doctors who will be opening the Emergency Room soon.

The team continued to help the community in many ways beyond the network services we provided. As reported in the SITREP dated 28 0430Z SEP05:

PRIOR TO ARRIVING ON STATION, CTN1 MOLLERE (FROM THE PENSACOLA NSGR UNIT) VOLUNTEERED FOR THIS DUTY AS HIS FAMILY HAD BEEN AFFECTED BY HURRICANE KATRINA. HE NOTED TO ME THAT HIS AUNT HAD PERISHED DURING THE STORM, BUT OTHERS HAD SURVIVED. UNFORTUNATELY, THEIR HOUSES WERE DESTROYED. HIS COUSIN BRIAN RODE OUT THE WAVES OF THE STORM ABOVE THE TREETOPS WITH HIS DOG “ROCKY” BY HIS SIDE. BOTH MIRACULOUSLY SURVIVED. IF ANY OF YOU HAVE HAD THE OPPORTUNITY TO SEE THE TV COVERAGE, THIS IS THE GENTLEMEN WHO LIVES ACROSS THE STREET FROM WHAT WAS ONCE WAVELAND CITY HALL AND HAS BEEN INTERVIEWED BY CNN, ABC, AND OTHERS....SO....DURING THE RV PREPARATION AND CLEANING, WE TOOK ALL OF OUR SPARE SLEEPING BAGS, CANNED GOODS, AND OTHER SUPPLIES THAT WE KNEW WE COULD NOT USE OR SAVE AND CTN1 MOLLERE TOOK THEM TO HIS FAMILY. THEY WERE VERY GRATEFUL AND PROBABLY OUR MOST DESERVING OF RECIPIENTS. GIVEN THAT MOST OF OUR CAMPING EQUIPMENT WAS DONATED BY A LOCAL MONTEREY BUSINESSMAN, HE CAN BE ASSURED THAT THE EQUIPMENT WENT TO A MOST DESERVING FAMILY OF ONE OF OUR OWN.

September 28, 2005 (Wednesday) – The network continued to perform well since the replacement of some of the HFN equipment originally deployed. Our main focus remained on transition preparation and maintaining the network services. The team was finally able to get Skype voucher issues worked out and we provided 100 vouchers, totaling 2,500 minutes of “free” calls, to relief workers and local victims/survivors at the “Internet Cafés” we had set up at Fred’s and other PODs. The relief workers, several of

whom happened to be tech savvy, helped the local survivors load and begin using the vouchers and provided feedback to the team. Once they ran out of these vouchers, the team provided them with more.

Robert Kirkpatrick from Microsoft's Groove Virtual Office (GVO) support office returned today to assist the Air Guard EMEDS personnel with installing and using Groove in their facilities in the Hancock County Hospital parking lot. They were very excited.

In accordance with our transition plan, the team parked Nemesis and the Ryder truck at NAVO Stennis today. All equipment not currently installed on the active network was stored in the Ryder for later return to Monterey, CA. Tomorrow morning, four team members will drive the two RVs back to Dallas.

James McCullough of World Wide Technologies (WWT)—the FEMA/General Services Agency (GSA) contracted vendor assigned to assume, and eventually replace, our infrastructure—arrived late today (almost 2000 hours) and we began our turnover to him. Additional WWT personnel are expected to arrive beginning on 29 September. During our initial meeting, we found out that WWT had not arranged for berthing and therefore needed accommodations for their team, but could not work the logistics of letting them “keep” the two RVs from Dallas in time. Unfortunately, due to the order modifications we just finished processing and the commitment to already return the RVs, WWT had to rent their own RVs (St. Louis, MO was the closest RV rental location they could find) and drove them to MS.

September 29, 2005 (Thursday) – Our main effort was to continue transitioning the network to WWT. Two team members (both Naval Security Group Reservists) remained to continue turn over with WWT personnel. Cisco was involved as a subcontractor and Jaime MacLain and Chris Verges, who had been with the team for the last several days, were already up to speed on equipment locations and services. James McCullough of WWT made initial rounds with the NPS Team to meet local POCs (and to conduct face-to-face turnover of network personnel with the end users) and learn where the nodes were. In addition to maintaining the network and providing turn over, the team was able to expand the network to reach the Bay St. Louis Senior Center across

from the Fire Station. We were now providing VoIP service to a location that previously had only a cell phone with a broken ringer. There were now seven nodes on the network.

Skype had been well received and continued to be provided to local users—who now enjoyed the capability to make absolutely free global long distance phone calls with just a laptop and a microphone/headset combo, many of which were provided by the NPS Team in the “Internet Cafés.” The team was awaiting feedback from local relief workers and standing by with more vouchers.

CTN1 Mollere received approval to return on 1 October and continued to assist with the transition.

The two RVs were safely delivered to Dallas after a very long drive and the four team members spent the night there before returning to Monterey, CA the following day.

Professor Steckler volunteered to bring the storm-damaged laptop and computer hard drives of the Bay St. Louis Mayor (Eddie Favre) back to San Jose, CA, in an attempt to recover the data on the drives.

September 30, 2005 (Friday) – Our main effort was focused on completing the transition to WWT/Cisco and getting all members of the NPS Team safely back home. CTN1 Mollere was to return 1-8 October as an independent reservist conducting remote weekend drill. His duties were to include providing the NPS Team with continual daily SITREPS of the transition, etc. Two more WWT contractors arrived on-site.

As required by the MS governor, all NPS Detachment Katrina personnel exited the Area of Responsibility (AOR) today. As reported by LCDR Gaucher in the final SITREP dated 30 1830Z SEP05:

TEAM IS RETURNING HOME WITH THE SATISFACTION THAT WE “DID GOOD THINGS” ON THE GROUND THERE IN WAVELAND AND BAY ST. LOUIS, MISSISSIPPI. OUR HOPE, AND INTENTION, IS THAT THE LESSONS LEARNED FROM THIS ENDEAVOR WILL IMPROVE THE MANNER IN WHICH VITAL COMMUNICATIONS LINKS AMONG CIVIL AUTHORITIES AND FIRST RESPONDERS AND BETWEEN SURVIVORS AND DISTANT FAMILY MEMBERS ARE DELIVERED IN FUTURE DISASTERS...I AM SURE ALL TEAM MEMBERS, PAST AND PRESENT, WILL JOIN ME IN SAYING THANK YOU FOR THE OPPORTUNITY TO BE A PART OF THIS FANTASTIC JOURNEY AND ALLOWING US THE CHANCE TO MAKE A SMALL DIFFERENCE IN THE LIVES

OF THE PEOPLE OF THE COUNTY OF HANCOCK IN THE GREAT
STATE OF MISSISSIPPI.... MISSION COMPLETE...