U.S. Public Health Service
Engineer Officers

Post-Deployment Report

Lessons Learned:

USNS Comfort Partnership for the Americas
USS Peleliu Pacific Partnership
Summer – Fall 2007

May 20, 2008

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Abbreviations:

AH	Auxiliary Hospital (USN ship classification)
CBMU	Construction Battalion Maintenance Unit – Seabees
CDC	Centers for Disease Control and Prevention
EHO	Environmental Health Officer
EPA	U.S. Environmental Protection Agency
EPAC	Engineer Professional Advisory Committee
FDA	Food and Drug Administration
FDPMU	Forward Deployed Preventive Medicine Unit
HHS	Department of Health and Human Services
IDP	Internally Displaced Persons
IHS	Indian Health Service
LCAC	Landing Craft, Air-Cushioned (USN ship classification)
LHA	Landing Helicopter Assault (USN ship classification)
LCU	Landing Craft, Utility (USN ship classification)
MEDCAP	Medical Civil-Assistance Program
NGO	Non-Governmental Organization
NKO	Navy Knowledge Online
NPS	National Park Service
OFRD	Office of Force Readiness and Deployment
OIC	Officer-In-Charge
PDSS	Pre-Deployment Site Survey
PHS	U.S. Public Health Service
PM	Preventive Medicine
SITREP	Situation Report
T	USN classification of ships under the Military Sealift Command
USN	U.S. Navy
USNS	United States Navy Ship (USN non-commissioned/civilian manned ships)
USS	United States Ship (USN commissioned ships)

Cover Photos: PHS Engineer and Environmental Health Officers in Papa New Guinea, USNS Comfort, and USS Peleliu (L to R)

TABLE OF CONTENTS

1 Introduction 1-1
1.1 Background 1-1
1.2 USS Peleliu – Pacific Partnership Mission 1-1
1.3 USNS Comfort – Partnership for the Americas Mission 1-2
1.4 Purpose 1-3
1.5 Scope and Methodology 1-3
2 PHS Engineer Mission Accomplishments 2-1
2.1 USS Peleliu – Pacific Partnership Mission 2-1
2.2 USNS Comfort – Partnership for the Americas Mission 2-4
3 PHS Deployment Management 3-1
3.1 Deployment Process 3-1
3.2 Agency Support for Deployment 3-1
3.3 PHS Engineering Experience Suitability 3-2
3.4 Leadership Skills 3-2
3.5 International Development Work Skills Sets 3-2
4 USN Mission Planning and Logistics 4-1
4.1 Pre-Deployment Site Survey 4-1
4.2 Ship Classification and Time Ashore 4-2
4.3 Command Structure 4-3
4.4 Metrics 4-3
4.5 Reporting of Mission Activities 4-4
4.6 Interaction with Non-Governmental Organizations 4-4
4.7 Cross-Cultural Orientation 4-4
5 Lessons Learned and Recommendations 5-1
5.1 Pre-Deployment 5-1
5.2 On-ship and In-Country Deployment 5-3
5.3 Post-Deployment 5-5
5.4 Recommendations 5-5
6 Recommended Additional Individual Packing Items 6-1

1 Introduction

1.1 Background

In the summer and fall of 2007, 10 U.S. Public Health Service (PHS) Commissioned Corps Officers (Officers) in the Engineer Category participated in two U.S. Navy (USN) humanitarian assistance missions aboard the USNS Comfort in Latin America and the Caribbean and the USS Peleliu in the Pacific region.

Historically, international agencies and non-governmental organizations (NGOs) have been the primary providers of humanitarian assistance in host countries. However, recently the U.S. military has had increased involvement in these missions and PHS Officers have provided support with deployments for the 2004 Tsunami, 2005 Earthquake relief efforts, 2006 USNS Mercy Pacific Partnership, and the 2007 USNS Comfort and USS Peleliu missions.

This post-deployment report provides a summary of the PHS Engineer Officers' (PHS Engineers) experiences and lessons learned from the 2007 deployments that will hopefully assist in conducting effective and successful humanitarian assistance missions in the future.

At a Glance – Findings and Recommendations: PHS Engineers achieved effective partnerships with the USN counterparts and provided significant accomplishments in support of the USNS Comfort and USS Peleliu missions with technical knowledge and experience being key factors for the success. Future humanitarian assistance missions would benefit from identification of specific public health infrastructure projects prioritized to reduce morbidity/mortality in the host country.

1.2 USS Peleliu – Pacific Partnership Mission

Pacific Partnership 2007 was officially launched on June 1 as the USS Peleliu (LHA-5), a multi-mission amphibious ship, departed Pearl Harbor for Southeast Asia and Oceania. The three-month, five-host country humanitarian assistance mission brought together host nation medical personnel, partner nation military medical personnel, and NGOs to provide medical, dental, construction and other humanitarian-assistance programs both ashore and afloat.

USS Peleliu

A goal of the deployment was to strengthen the good will forged between host nation partners, American forces and NGOs during previous assistance missions, such as the 2004 Tsunami, 2005 Earthquake relief efforts, and the USNS Mercy (T-AH-19) deployment in 2006.

The USS Peleliu's crew included personnel from U.S. Navy, Army and Air Force; PHS; the U.S. Navy Seabees (construction battalions); and NGOs including Aloha Medical Mission and Project Hope.

The PHS Engineers were part of three successive teams deployed for one-month

tours with three to seven PHS Officers on each team. The Pacific Partnership deployment for the PHS was fundamentally a public health infrastructure building mission with the PHS team consisting primarily of engineers and environmental health officers. However, the primary focus of the Pacific Partnership mission was clinical, with the ship overwhelmingly staffed with medical personnel.

The seven PHS Engineers deployed on or in support of the USS Peleliu mission are listed chronologically based on deployment date in the following table:

Table 1. USS Peleliu – PHS Engineers

PHS Engineer/Agency	Deployment
CDR D. DeVoney/EPA	JUN – JUL
LCDR A. Sallach/EPA	JUN – JUL
LCDR M. MarcAurele/IHS*	JUL
CDR S. Bosiljevac/NPS	JUL – AUG
CDR S. Anderson/IHS*	JUL – AUG
LCDR E. Dieser/CDC	AUG – SEP
LT N. Hassan/ FDA	AUG – SEP

* Deployed as part of the USN Assessment Team in support of the USS Peleliu mission

USS Peleliu provided humanitarian assistance programs ashore in the host countries during the periods listed in the table below:

Table 2. USS Peleliu Host County Visits

Host Country	Month
Philippines	JUN
Vietnam	JUL
Papua New Guinea	AUG
Solomon Islands	AUG
Marshall Islands	SEP

For additional information see:
http://www.cpf.navy.mil/subsite/Peleliu/index.html

1.3 USNS Comfort – Partnership for the Americas Mission

Partnership for the Americas 2007 was officially launched on June 15 as the USNS Comfort (T-AH-20), a hospital ship, departed Norfolk, Virginia for Latin America and the Caribbean. The four-month, 12-host country mission was to conduct training and humanitarian assistance operations and brought together host nation medical personnel, partner nation military medical personnel, and NGOs to provide medical, dental, construction and other humanitarian-assistance programs ashore and afloat.

USNS Comfort

The USNS Comfort mission was part of the initiatives of President Bush and Department of Health and Human Services (HHS) Secretary Michael Leavitt for "advancing the cause of social justice in the Western Hemisphere".

The USNS Comfort's crew included personnel from U.S. Navy, Army, Air Force, and Coast Guard; PHS; the U.S. Navy Seabees (construction battalions); and NGOs including Operation Smile and Project Hope.

The PHS Engineers were part of four successive teams deployed for one-month tours with approximately 17 PHS Officers on each team. The Partnership for the Americas deployment was fundamentally a clinical mission with a primary team

emphasis on medical, dental, and nursing officers. To date, it was the largest deployment of PHS Officers on a USN ship.

The three PHS Engineers deployed on the USNS Comfort are listed chronologically based on deployment date in the following table:

Table 3. USNS Comfort – PHS Engineers

PHS Engineer/Agency	Deployment
CAPT C. Brady/IHS	JUN – JUL
CAPT P. Rapp/IHS	AUG – SEP
CDR L. Hanley/EPA	SEP – OCT

USNS Comfort provided humanitarian-assistance programs ashore in the host countries during the periods listed in the table below:

Table 4. USNS Comfort Host County Visits

Host Country	Month
Belize	JUN
Guatemala	JUN – JUL
Panama	JUL
Nicaragua	JUL
El Salvador	JUL – AUG
Peru	AUG
Ecuador	AUG
Colombia	AUG
Haiti	SEP
Trinidad and Tobago	SEP
Guyana	SEP - OCT
Suriname	OCT

For additional information see:
http://www.news.navy.mil/local/tah20/

1.4 Purpose

The PHS Engineers contributed to many significant accomplishments and successes during the missions. A primary purpose of this report is to document the encounters and stories and share them with others. Moreover, as with any complex and multi-agency undertaking, there were areas in which operations could have been conducted more effectively. Therefore, this report also provides a summary of the operational lessons learned for follow-on action.

The goal of this report is to serve as a comprehensive document detailing and highlighting the many positive mission accomplishments as well as a supporting document that can used to prepare PHS Engineers for future humanitarian assistance missions. Implementation of the recommendations will hopefully strengthen the partnership between the PHS and USN and create the framework for more effective and successful missions in the future.

This report is a combined effort by the PHS Engineer Professional Advisory Committee (EPAC) Emergency Preparedness and Career Development subcommittees and the PHS Office of Force Readiness and Deployment (OFRD).

1.5 Scope and Methodology

To collect the accomplishments and lessons learned, each of the 10 PHS Engineers completed a 20-item questionnaire with the responses summarized in this report. Further discussion and insight occurred during the 2008 PHS Scientific and Training Symposium planning meetings for the Engineer Category Day panel presentation titled “Building on the USS Peleliu and USNS Comfort Engineer Deployments”.

This report does not represent a comprehensive review of the PHS deployments on the two USN humanitarian missions, but is based upon experiences and issues brought out as responses to the questionnaire. This report was developed from February to May 2008.

2 PHS Engineer Mission Accomplishments

2.1 USS Peleliu – Pacific Partnership Mission

The PHS Engineers on the USS Peleliu mission were part of the USN Forward Deployment Preventive Medicine Unit (FDMU) and the USN Assessment Teams. Selected significant accomplishments include:

PHS Engineer Accomplishments

- Conducted water quality sampling for chlorine residual, coliform, nitrates, and metals for approximately 40 drinking water sources in 12 internally displaced persons (IDP) camps and municipal water supply systems impacting as many as 100,000 people;

Well water quality sampling at an IDP camp

- Provided interpretation of water quality findings including risk assessment and potential health effects in infants being fed formula made with nitrite/nitrate contaminated water sources;

- Provided recommendations on four wells serving IDP camps with nitrate above the maximum contaminant level, including taking wells out of service and routine sampling;

Conducting water quality sampling of a sand filter at an IDP school

- Completed assessments and surveys of three municipal water systems identifying potential source protection issues from both surface and subsurface contamination;

- Provided an evaluation and recommendations for a portable water treatment system serving 1,600 people at an IDP camp – recommendations included adjustments of the flocculation process and to the settling basin;

Sampling well and sand filter at an IDP camp

- Provided trainings to 30 local host country sanitarians and engineers on well-head design, source water protection, and alternative low technology options for wastewater treatment and disposal facilities;

- Identified multiple locations where pit privies and/or shower facilities were adjacent to and/or up-hill/gradient from potable water supply wells;

- Conducted soil permeability field tests for evaluation and correlation between high nitrite/nitrate contamination of water wells and the adjacent sanitation and wastewater disposal systems;

Field permeability tests

- Participated in briefings with the host country regional medical officer presenting significant findings and recommendations including a corrective action plan for well construction with a sanitary grout seal;

- Collaborated with the USN on a report of findings for all IDP camp surveys with analytical results and recommendations appropriate for the technological framework of the host country communities;

Visiting a local school at an IDP camp after well sampling

- Participated on USN Assessment Team in Papa New Guinea and identified high impact public health projects that were forwarded to the USS Peleliu mission;

- Identified public health needs that directly resulted in the construction of a new water source for a village in Papa New Guinea;

Conducting site assessments
(Mission authorized civilian attire)

- Established strong professional working relationship with the USN FDPMU and Seabee units;

- Provided planning, design, and construction management of sanitation facilities in host country;

- Completed the construction of one well point and trained host country local contacts on the construction method for this type of water source (subsequently, village began work on a second well point – village water source had been only rainwater collection and untreated river water);

Technical assistance for the construction of a new water source

Constructing a new water well

- Constructed a foundation for two high density polyethylene (HDPE) elevated water storage tanks – construction was performed as a demonstration project to train host country local contacts;
- Assisted in the setup of MEDCAP site prior to the MEDCAP team arrival;

Disinfecting a new water storage tank

- Participated on USN Assessment Team in the Marshall Islands and identified key host country governmental officials and high impact public health projects;

Conducting site assessments
(Mission authorized civilian attire)

- Fostered collaboration between local ministry of health, environmental protection agency, and water and sewer authority during public health training;
- Prepared community-based training material based on environmental health assessments for water quality analyses;
- Conducted water quality testing and assessments of water distribution systems and surveys of solid/medical waste sites;
- Developed informational guides on rain harvesting, disinfection, and sanitation for host country local officials;

Assessments and water quality testing

Water quality preparation aboard ship

- Developed an emergency response plan and training including Incident Command System (ICS) basics for the regional hospital; and
- Provided recommendations and training concerning food safety, inspections, foodborne outbreaks, and recall issues.

Technical assistance at a water system

2.2 USNS Comfort – Partnership for the Americas Mission

The PHS Engineers on the USNS Comfort mission were part of the USN Preventive Medicine Team. Selected significant accomplishments include:

PHS Engineer Accomplishments

- Developed training material on water quality, treatment techniques, household water storage and treatment, and cross-connections;
- Conducted trainings for local water utility boards, ministry of public health staff, elementary school children, and host country populations at clinics;

Public health training at a local school

Trainings at the ministry of public health staff

- Provided training on water source protection and safe distribution practices to 150 college students;

- Conducted assessments and recommended corrective measures for community water system source protection, treatment, and disinfection;

Water system assessment

- Surveyed municipal water system with ministry public health officials to identify potential cross-connections and significant areas of water loss – recommendations included correlation with vector habitats;

- Assessed hospital water supply and distribution system – identified and provided recommendations for water hammer surge issues;

Water system assessment

Reviewing design drawings

- Teamed with Seabees from the Construction Battalion Maintenance Unit (CBMU) in the construction of a new health clinic in a remote indigenous village with technical/construction assistance for the water catchment and supply system, drain and waste piping, and interior structural walls;

Technical assistance for a new wastewater system at a local health clinic

- Teamed with Seabees from the CBMU in the renovation of an existing health clinic with technical/construction assistance for the water storage reservoir, pressure system, plumbing, and electrical power supply – water service was restored to the facility for the first time in three years;

Constructing a new health clinic

Constructing a new water system for the health clinic

- Met with host country health minister and cabinet to discuss and perform an evaluation of the country's proposal to the World Bank for an incinerator for improvements to its medical waste disposal;

- Drafted report to the host country health minister with comments and suggestions on the World Bank proposal concerning the incinerator's operating procedure and improved disposal practices at the existing solid waste site so that it could operate as a landfill;


Assessment of community water system

- Provided technical assistance and recommendations on community drinking water system operation, conducting water quality testing, wastewater system operation, the existing solid waste facility, and options for designing a landfill; and

- Provided assistance to host country health inspectors on assessment of buildings for asbestos and food safety issues.

3 PHS Deployment Management

3.1 Deployment Process

The PHS Engineers first obtained approval from their immediate supervisors and formally applied through the Agency liaison to OFRD for the mission. Overall, OFRD was very receptive and accommodating to the Officer's requested deployment month. The majority of the PHS Engineers did not deploy during their OFRD on-call month.

Depending on the actual deployment date and mission dynamics, PHS Engineers were notified as little as one week prior to as much as three months in advance of their deployment. The OFRD provided additional support to PHS Engineers deploying with limited notice in securing official passports, uniforms, and completing required documents. Some PHS Engineers did express the need for enhanced communication from OFRD concerning the status on the deployment request.

Because of the immediate nature of the request to have PHS Engineers as part of the USN Assessment Teams, only 24 hours advanced notice was provided. The PHS Engineers deployed at the request of OFRD with concurrence from their supervisors. The PHS Engineers that participated on the assessment teams had prior experience working in the Pacific region from a deployment on the 2006 USNS Mercy Pacific Partnership mission and a prior assignment on American Samoa.

Prior to deployment, PHS Engineers on some of the teams conducted weekly group conference calls, which proved to be very beneficial for planning purposes and to disseminate and discuss information about the mission. For example, the second team on the Pacific Partnership mission started weekly calls and continued contacts with the subsequent teams throughout the mission. Once team two deployed, the PHS Engineer and PHS Environmental Health Officer (EHO) on ship continued contact with team three initially by email and then with one conference call from the ship about a week before team three deployed. The contact between the team that deployed and preparing to deploy provided a higher level of continuity once the replacement team arrived aboard ship. Additionally, team three PHS Engineers forwarded their curriculum vitae to the ship and were contacted by USN Officers of the FDPMU prior to their arrival so that their specific expertise and experience could be reflected in the mission plans for the host countries.

3.2 Agency Support for Deployment

Agency support for the PHS Engineer's deployment varied depending on the specific Agency, location, and immediate supervisors.

In general, the Centers for Disease Control and Prevention (CDC) provided a high level of support for the deployment, including official passport services, medical and prophylaxis services, and equipment (waterproof cameras, memory sticks, first aid kits, etc.). PHS Engineers assigned to the U.S. Environmental Protection Agency (EPA), Indian Health Service (IHS), and National Park Service (NPS) did receive overall support from their Agencies. Certain Agencies are favorable to deployments as it enhances and supplements the skill sets of the PHS Engineers that may be involved with emergency response-related work.

Many PHS Engineers made specific arrangements with their supervisors or performed additional tasks to ensure that their Agency-assigned duties had adequate resources over the course of the deployment month. In some cases, the PHS Engineer's supervisor and subordinate engineers provided coverage during the

absence, and in other cases, the PHS Engineer devoted additional work hours to tasks prior to deployment. In one instance, the immediate supervisor required the PHS Engineer to complete all work assignments covering an approximate three-month period (prior, during, and post-deployment).

3.3 PHS Engineering Experience Suitability

Overall, the PHS Engineer career experience provided a strong foundation to carry out the humanitarian mission duties. The PHS Engineers provided a wide variety of expertise and knowledge including community risk assessments; project management; water and sanitation facilities design and construction; operation and maintenance of small utilities; emergency response; and foodborne outbreaks. In addition, work experience prior to PHS also provided significant knowledge and skills applicable to the mission, such as prior service in the U.S. Peace Corps, U.S. military, and in engineering/construction-related work.

3.4 Leadership Skills

The PHS Engineer leadership skills were found to be sufficient to complete the activities and tasks assigned. In particular, PHS Engineers were required to exhibit a high level of coordination and collaboration with both the USN and host country officials in order to effectively complete the mission tasks.

The PHS Engineers with prior military service were frequently called upon for advice and recommendations on USN protocol matters. The USN mission provided an outstanding setting for the PHS Engineers to gain additional leadership experience, specifically with interaction with other U.S. uniformed services.

The PHS Engineers did express that there were challenges from the level of expectations as a senior officer within the USN environment. This situation provided excellent experience and for the most part beyond what could have been presented in other forums such as trainings or in a leadership seminar.

The PHS Engineers on the missions were considered an expert source of information. In this role, leadership required effective communication skills to provide competent information with a high level of confidence. The PHS Engineers served as primary contacts with host country health officials and lead authors of many reports. The PHS Engineers also used leadership skills to identify and prioritize the engineering-related tasks among the many mission objectives.

3.5 International Development Work Skills Sets

International development work requires a special set of skills in addition to professional expertise. These skill sets typically take months to years to acquire and perfect. The PHS Engineers that deployed recognize this skill set as an important consideration for staffing of international humanitarian missions. Key PHS personnel should have these skills, which would allow for mentoring of other PHS Officers and strengthen the success of the mission as a whole.

In addition to overall leadership skills, core competencies and effective behaviors for international development work would include the following:

- Speaks and writes clearly, adapting communication style and content so they are appropriate to the needs of the intended audience;
- Conveys information and opinions in a structured and credible way;
- Works productively in an environment where clear information or direction is not always available;

- Remains productive when under pressure;
- Stays positive in the face of challenges and recovers quickly from setback;
- Produces high-quality results and workable solutions that meet host country and organizational needs;
- Acts without being prompted;
- Is receptive to new ideas and working methods;
- Adapts readily and efficiently to changing priorities and demands;
- Works collaboratively with team members to achieve results;
- Encourages cooperation and builds rapport among fellow team members;
- Identifies conflicts early and supports actions to facilitate their resolution;
- Understands and respects cultural issues and applies this to daily work and decision making; and
- Relates and works well with people of different cultures.

4 USN Mission Planning and Logistics

4.1 Pre-Deployment Site Survey

Typically, the USN has two pre-deployment mission activities to determine and confirm the tasks and logistics in the specific host country before the ship arrives. They occur approximately six months and one month prior to the mission. The outcomes from the USN assessments are documented in the Pre-Deployment Site Survey (PDSS), which becomes the primary action plan for the mission with identified sites, activities, and priorities for the mission.

On both missions, and especially on the USNS Comfort, the primary emphasis of the PDSS was medical and dental services with less emphasis placed on public health infrastructure issues. The majority of the PHS Engineers indicated that the PDSS did not provide sufficient guidance or specific direction for beneficial public health infrastructure work and that the actual activities performed were identified once ashore. It was common to have the initial time on shore used to meet local host country officials to identify, review, and discuss public health needs, and present PHS Engineer and USN Team capabilities and assistance. Frequently, PHS Engineers were able to refine broad on-shore mission objectives into specific tasks that included public health infrastructure activities.

For host countries with visits of less than a week, it was a challenge to complete activities unless the projects were specifically detailed in the PDSS, host country contacts were identified, and meetings were prearranged. Time should be allotted for the PHS Engineers to establish and develop meaningful working relationships with the host country public health officials.

PHS Engineers on USN Assessment Teams

On two separate occasions PHS Engineers were included with the USN advanced teams that assisted in evaluating and assessing the public health infrastructure and aided in mission planning for the subsequent USS Peleliu visit.

Prior to the arrival of the USS Peleliu, LCDR MarcAurele and CDR Anderson were with the USN Assessment Teams in Papa New Guinea and the Marshall Islands, respectively. The USS Peleliu command determined that previous planning missions had not inserted enough public health infrastructure work. The impetus was to shape the USN's response toward greater measurable public health work for the mission. The USN Assessment Teams were charged with identifying high impact public health infrastructure projects with a focus on water and sanitation as much as possible.

LCDR MarcAurele identified specific public health infrastructure needs and recommended projects. The findings, suggestions, and comments were incorporated into the USN daily Situation Report (SITREP) and the PDSS for the Papa New Guinea mission. As a result, CDR Bosiljevac was able to have the recommended well points fabricated aboard the ship and once ashore in Papa New Guinea, was able to construct the new water source. The advanced planning activities proved to be invaluable and directly resulted in the construction of needed water source facilities in the host country village.

CDR Anderson also documented public health infrastructure projects including recommendations to construct drinking water tap stands, install an incinerator for

medical waste, and conduct several sanitary surveys for community water and sewer systems. Many of the recommendations in the report however were not fully completed due to resource scheduling challenges.

The PHS Engineers' role in early planning activities for the PDSS can be a critical component to the USN mission. The PHS Engineers can assist in identifying high impact public health infrastructure projects for the subsequent missions. It is critical to have the identified projects be consistent and coordinated with the scheduling, resources, and expertise on ship for the mission in the host country.

4.2 Ship Classification and Time Ashore

The majority of the time, PHS Engineers reached the host country site by watercraft from the ship followed by ground transportation, if required. On occasion, PHS Engineers traveled by helicopter or if the ship was able to dock in a major port, only ground transportation was required to reach the site.

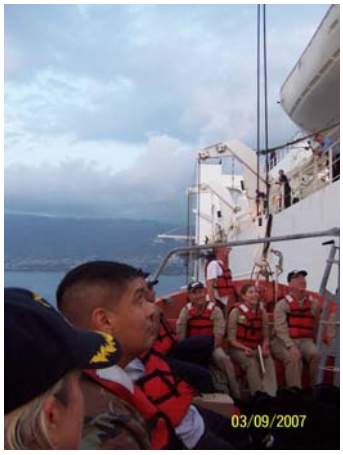
The Pacific Partnership mission utilized the USS Peleliu, a Landing Helicopter Assault (LHA) ship. The USS Peleliu has the capability to transport personnel and supplies ashore with Landing Craft Utility (LCU) and Landing Craft Air-Cushioned (LCAC).

Transportation on the USS Peleliu

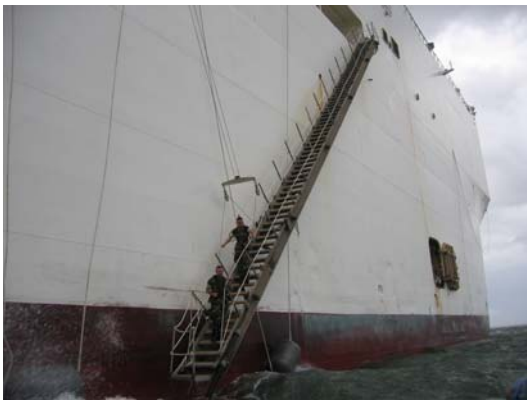
Landing craft from the USS Peleliu

LCAC ashore from the USS Peleliu

The Partnership for the Americas mission utilized the USNS Comfort, an Auxiliary Hospital (AH) ship. Personnel and supplies from the USNS Comfort were transported primarily in local host country vessels. Ship personnel were lowered down by lifeboats and boarded the local host country boats going ashore. On other occasions, personnel boarded the host country boats from the ship's exterior ladders and doors. In most cases, total transport time to the host country and back to the ship lasted several hours.



Launching personnel from the USNS Comfort using life boats


Landings on the USNS Comfort


Returning to the USNS Comfort

Part of the significant success of the PHS Engineers aboard the USS Peleliu can be attributed to the fact that in some host countries they had approximately two weeks continuous time on shore at the mission site. This allowed them to develop important contacts with local host country officials and complete multi-stage projects, e.g. water quality testing, results, and recommendations.

However, PHS Engineers on the USNS Comfort typically only had three to five days at each host country with daily travel required from ship to shore to the mission site, which consumed significant hours in the day. This made it particularly challenging to identify needs and complete significant projects on shore.

4.3 Command Structure

The PHS Engineers on the USNS Comfort were part of the USN Preventive Medicine (PM) Team and on the USS Peleliu were assigned to the Forward Deployed Preventive Medicine Unit (FDPMU). The USN teams included environmental health, entomologist, veterinarian, and physician disciplines.

The PHS Engineers were under the command structure of the USN OIC of the PM or FDPMU teams for both on shore and aboard ship activities. However, typically the PHS Engineers were given the authority to carry out mission objectives ashore without direct OIC involvement and the PHS Engineers were able to work and interact with host country representatives. Overall, the USN leadership provided the command structure, support, and flexibility for the PHS Engineers to perform in an effective way. The PHS Officer-In-Charge (OIC) provided leadership and support for PHS-related tasks and activities. Both the USN and PHS leadership was at a high level.

4.4 Metrics

The metrics for the engineering activities were not well defined, as the primary emphasis was measurement of patient encounters. However, specific accomplishments by the PHS Engineers

were documented and often forwarded to the USN ship's command.

A common metric used for the engineering activities included the number of trainings and assessments provided. The current metrics of the engineering activities may not fully capture the wide impact from the meetings, trainings, assessments, technical assistance, and projects completed. As an example, an assessment and corresponding improvements to a water disinfection system may result in a significant public health impact for the entire community. In addition, meetings with host country public health officials to provide technical or policy suggestions may have far-reaching impacts if implemented on a wide scale. However, it may only be reported as a single survey in the USN briefings or metrics and unevenly compared to multiple patients contacts by clinicians. Therefore, future missions should consider developing engineering-specific metrics with appropriate weights for high-impact surveys, assessments, trainings, and projects.

4.5 Reporting of Mission Activities

The PHS Engineers spent approximately 1 to 3 hours per day documenting activities and many kept personal field logbooks making daily entries of activities. The PHS Engineers that deployed for continuous days on shore completed the majority of their reporting after returning to ship.

Both the USN and PHS had no pre-established structure or reporting method to document public health infrastructure-related mission activities. The reporting structure was developed on ship during the mission. Some PHS Engineers devoted time after the mission to report and summarize activities and accomplishments.

4.6 Interaction with Non-Governmental Organizations

Overall, there was not any significant interaction with NGOs during the in-country deployments. In one host country, the Solomon Islands, the French Red Cross did assist the USN FDPMU by providing local knowledge, contacts, and guides for the area. In addition, a Project Hope nurse worked with the PHS Engineer and the USN FDPMU on an emergency and disaster response plan for a host country hospital.

At several sites, PHS Engineers did provide assessments on previously installed NGO facilities and equipment. For example, PHS Engineers evaluated facilities for IDP camps, and in these cases, became familiar with general Sphere (a charter on minimum standards to be attained in disaster/humanitarian assistance) recommendations.

Additionally, in Guyana, a PHS Officer stationed in the host country (providing assistance with HIV/AIDs programs) was instrumental in organizing the meeting with the Health Minister and his Cabinet.

4.7 Cross-Cultural Orientation

In most cases, while on ship the USN did provide some cross-cultural orientation. It was expressed that some PHS Officers with prior experience as U.S. Peace Corps Volunteers, international deployments with the U.S. military, and such agencies as the Indian Health Service were well suited for the mission. Additional cross-cultural orientation would be beneficial for future deployments.

5 Lessons Learned and Recommendations

5.1 Pre-Deployment

Lessons learned for pre-deployment activities include the following:

Conducting pre-deployment site assessments
(Mission authorized civilian attire)

Pre-Deployment Lessons Learned

1. In coordination with the USN, place PHS Engineers on the six and one-month assessment teams during the development of the PDSS in order to assist in identifying public health infrastructure-specific deficiencies and project details;
2. PHS Engineer involvement at the early stages of the mission development would allow for input on construction materials and equipment required either on ship or arranged for in the host country;
3. Have the identified PDSS projects be consistent and achievable with the scheduling and resources of the mission;
4. OFRD should communicate mission objectives and importance to Operating Division leads with requests to disseminate information to appropriate levels;
5. Enhance communication between OFRD, the PHS Officer, and Agency liaison during the selection process;
6. OFRD should identify, select, and notify PHS Officers for deployment at least three weeks in advance so that the PHS Officer has adequate time for deployment requirements (e.g. immunizations) and to make appropriate family and work arrangements for the month absence;
7. OFRD should provide enhanced briefing to PHS Officers traveling on international flights and verify requirements for entire itinerary – in some cases, PHS Officers had difficulties at foreign airports because they did not have ticketed return flights;
8. Have PHS Officers on international flights travel as a team or units – individual travel may be a concern especially with stays in countries with elevated force protection risks;
9. OFRD should establish a “deployment folder” (e.g. on the OFRD website) which could contain information on those selected for deployment, all the recent and updated information/requirements for that mission, and a subset where returning team members could enter comments and lessons learned;
10. As much as possible, OFRD should review the engineer-related needs and projects identified in the PDSS and match with a suitable PHS Engineer having that knowledge and experience;
11. Provide those PHS Officers selected for deployment with access permission for the Navy Knowledge Online (NKO) in order to complete required training and obtain host country updates;
12. In some cases the Official Passport was difficult to obtain within the required time;
13. In addition to Basic Readiness, establish an International Deployment Readiness

standard, with an Official Passport being one of the requirements;
14. OFRD should clarify with the USN whether or not specific required immunizations can be provided on ship – PHS Engineers had difficulties obtaining certain immunizations prior to deployment, however the vaccinations were readily available on ship;
15. Number of uniforms listed for deployment was more than actually required – suggest two complete field uniforms (long sleeve working khaki or BDU, as appropriate for mission), one long sleeve working khaki, two USN blue coveralls, one service white;
16. OFRD should consider using scheduled military air transports to improve efficiency and controlling costs to transport PHS Officers;
17. PHS OIC should contact Officers prior to deployment;
18. OFRD and PHS Officers on each team should conduct conference call(s) to plan and discuss deployment topics such as travel, force protection, and mission briefs – have a team meeting prior to deployment and involve teams that have already deployed on ship;
19. Have first team of PHS Engineers contact USN counterparts prior to departure in order to enhance planning;
20. PHS Engineers should receive the PDSS prior to departure, which would allow for better preparation and knowing which reference materials and equipment to pack;
21. PHS Engineers should research information about the host country prior to departure including development goals and priorities, health advisories, basic language phrases, and culture;
22. PHS should conduct routine activities with USN and other services to increase overall competence of PHS Officers with military protocols;
23. The value of a packed ready-to-go bag is critical – deployments may happen with very short notice;
24. Equipment and uniform items for deployment had to be purchased by the individual PHS Officer – cost may be significant;
25. Government credit card limits are more restrictive than personal credit card – may need personal card as a back-up (notify credit card company of potential use in host country);
26. During the PDSS site assessments, bring a SIM-based cell phone;
27. Have information on your point of contact for PHS, USN, or host country; and
28. Trainings should be provided on the following topics:
    A. Cross-cultural and working in developing countries – OFRD coordinate trainings with the Commissioned Officer Training Academy (COTA) to develop training programs and country briefs for anticipated countries on future USN missions (training may be similar to U.S. Peace Corps programs);
    B. Host country security and safety orientation for PHS Officers deploying to those areas;
    C. International travel including general security and safety concerns;
    D. NGOs and international public health response network;
    E. Sphere (a charter on minimum standards to be attained in disaster/humanitarian assistance) guidelines, typical equipment (e.g. water filters) supplied by NGOs, and public health systems and technologies in developing countries;
    F. USN protocol including information/refresher on USN officer and enlisted ranks;
    G. Overview of Uniformed Code of Military Justice (UCMJ) – although PHS Officers are typically not subject to it, they should have a general understanding while serving with U.S. military counterparts;
    H. Leadership exercises with USN; and
    I. USN ship orientation, safety, and on-ship life.

5.2 On-ship and In-Country Deployment

Lessons learned for on-ship and in-country deployment activities include the following:

Well water quality sampling and inspection at an IDP camp

Deployment Lessons Learned

1. Key competencies and effective behaviors include flexibility, willingness to adopt, fostering team work, and cultural sensitivity;
2. Actual mission tasks and duties may not be as expected – remain flexible, provide the greatest impact and benefit to the mission as possible, and enjoy the unique experience;
3. PHS Officers should be in good physical shape – missions require long work days in tropical environments;
4. Need to respect and have an understanding of USN protocols;
5. Need to respect and have an understanding of the host country culture – the goals of the missions are not only public health but also of good will and respectful partnerships (potential harm could come from making the host counties feel inadequate);
6. PHS Officers need to make every effort to wear the uniform correctly and maintain proper grooming standards;
7. PHS Engineers provided a wide variety of technical knowledge and experience including water quality and treatment, wastewater treatment and disposal, food safety, construction techniques, and emergency planning that could be utilized during the mission;
8. PHS Engineers provided a comprehensive approach to public health with a focus on general and underserved populations, which is different from military preventive medicine that is primarily focused on protection of deployed forces;
9. Time on ship with the USN prior to deployment to host country was important for orientation, integration, and planning purposes;
10. Along with the PHS OIC, assign for the duration of the deployment a PHS Engineer or EHO as the PHS Executive Officer to assist in coordinating the environmental health mission objectives and activities with the USN;
11. At a minimum, have the PHS Engineer that assisted with the site assessments provide pre-deployment briefings to the PHS Engineers on the mission, and if possible, serve during the actual mission to provide enhanced continuity;
12. The PDSS projects and activities should be consistent and coordinated with the available resources and expertise on ship for the mission;
13. PHS Engineers teamed well with the Seabee units – consider specific collaborative public health infrastructure projects for the PHS Engineers and Seabee units (or a few Seabees assigned to the PM or FDPMU Teams) such as water source protection, water source construction, water treatment, and sanitation;
14. Assigning PHS Engineers with Seabee Units on non-public health infrastructure related construction projects may not be the best use of resources;
15. As part of future missions, PHS Engineers should provide formal trainings for local host country engineers and sanitarians;
16. While assessments and surveys of environmental facilities can be

beneficial, importance should be given to providing improved facilities, which would have immediate and long term benefits;

17. Typically, host country representatives have a basic knowledge and understanding of issues, however lacked resources and community momentum to accomplish the projects – humanitarian missions such as these can provide the impetus to accomplish these activities;
18. Metrics (e.g. trainings and assessments) to account for engineering activities were not always applicable and reflective of the wide scope and impact of the work performed – PHS and USN should develop applicable engineering metrics for future missions;
19. In many countries, PHS Engineers only had three to five days at each host country with daily travel required from ship to shore to mission site, which limited time for task activities;
20. Some PHS Engineers on the USS Peleliu had approximately two weeks continuous time on shore at the mission site, which enhanced the ability to identify and complete projects;
21. It is highly beneficial to have good communication between the deployed team and the next rotation of PHS Officers to facilitate the transition (include USN as appropriate);
22. Specific capabilities on the USN ship contributed to the success of the mission, e.g. water quality testing and method of transportation;
23. In many cases, the combined services of a PHS Engineer and PHS EHO worked well in addressing the wide variety environmental issues in the host country and fostered a team approach to solving problems;
24. In some instances, it was beneficial to present and utilizes the services of the whole PM team to the host country on focused areas or communities involving all the disciplines of engineering, environmental health, medical, and vector control;
25. Providing host country public health staff with selected equipment (e.g. chlorine residual test kits) may be beneficial in continual system operations and public relations;
26. PHS Engineers should be aware and have full understanding of force protection issues, a priority for USN operations;
27. Force protection issues limited the area PHS Engineers could travel to and provide technical assistance – in some cases, PHS Engineers could not leave the health clinic site (identified on the PDSS) to the nearby community water facilities because they had not been previously identified in the PDSS and were beyond the pre-arranged secured area;
28. Computer and internet access is limited on ship – consider bringing a laptop;
29. Bring compact disk or thumb drives with technical information related to host country needs;
30. Bring reference books – recommend two specific to host country needs;
31. PHS Engineers should be familiar with U.S. military field manuals on preventive medicine, hygiene, and sanitation;
32. Establish a technical reference library on the PHS Engineers Web site that could be accessed from the ship;
33. Experience in non-English speaking work situations allowed effective adjustment and working situations with host country representatives;
34. International development work requires a special set of skills in addition to professional expertise – the staffing of international humanitarian missions needs to insure that key PHS personnel have this for the success of the mission and to provide guidance to PHS Officers who are still developing the skill set; and
35. Junior PHS Officers gain considerable technical and leadership experience from the missions.

5.3 Post-Deployment

Lessons learned for post-deployment activities include the following:

Good will – helping to save the life of a dolphin in the host country

Post-Deployment Lessons Learned

1. Be prepared for travel complications in flights and hotel reservations;
2. OFRD to confirm requirements for international travel in specific countries, e.g. customs requirements for ticketed return flights;
3. Have PHS Officers on international flights travel as a team or units – individual travel may be a concern especially with stays in countries with elevated force protection risks;
4. Conduct a first-impression report or debriefing session to provide an initial rapid analysis soon after the deployment – reporting several months after the mission may be late in the process;
5. Difficulties with PHS Officers being released and re-attached to GovTrip (the HHS travel system); and
6. PHS Officers bring PHS coins to exchange with USN counterparts and host country officials.

5.4 Recommendations

The US and PHS flags at sea

This report recommends that the PHS EPAC Emergency Preparedness subcommittee utilize the findings and lessons learned in this report to develop a prioritized list of critical recommendations in collaboration with the PHS Engineers that deployed on the missions. It is recommended that EPAC place efforts to address key recommendations with assistance and consultation with the Chief Engineer and OFRD as required. The desire is that the knowledge and insight gained from the lessons learned from these missions will support and enable greater success for PHS Engineers on future health diplomacy and humanitarian assistance deployments.

Smiles from the host country children

6 Recommended Additional Individual Packing Items

In addition to required packing items for deployment, consider the following:

Finances
- Cash
- Credit card (personal)
- IMPAC Visa Card (U.S. Government)

Clothing
- One complete required deployment uniform packed with carry-on bag

Personal Protective Equipment (PPE)
- Safety glasses
- Gloves
- Ear plugs

Electrical/electronic equipment
- Laptop computer
- Compact disks (CD) or thumb drive/data stick – spare
- Thumb drive/Data stick – with technical information
- Cell phone, charger, and SIM card

Stationery
- Note book/engineer paper
- Calculator-solar and/or battery

Equipment
- Camera – digital
- Flash light
- Swiss army knife/Leatherman
- Tape measure
- Compass
- Chlorine residual test kit

References

International Water and Sanitation

1. Davis, J. and Lambert, R. (2002). *Engineering in Emergencies*, Second Edition, ITDG Publishing.

2. Wisner, B. and Adams, J. (2002). *Environmental health in emergencies and disasters*, World Health Organization (WHO).

3. World Health Organization (WHO). (1997). *Guidelines for drinking-water quality*, Volume 3, Second Edition.

4. United Nations Environmental Program (UNEP). (2004). *Harvesting the Heavens – A Manual for Participatory Training in Rainwater Harvesting*.

General Environmental Engineering

1. American Water Works Association (AWWA):
   - *AWWA Wastewater Operator Field Guide*.
   - *AWWA Water Operator Field Guide*.

2. California State University, Sacramento, College of Engineering and Computer Science, Office of Water Programs:
   - *Operation of Wastewater Treatment Plants, Volumes I and II*.
   - *Advanced Waste Treatment*.
   - *Industrial Waste Treatment, Volumes I and II*.
   - *Operation and Maintenance of Wastewater Collection Systems, Volumes I and II*.
   - *Water Treatment Plant Operation, Volumes I and II*.
   - *Water Distribution System Operation and Maintenance*.
   - *Small Water System Operation and Maintenance*.
   - *Utility Management*.

3. Salvato, J. (1992). *Environmental Engineering and Sanitation*, Fourth Edition, John Wiley Publication.

4. U.S. Environmental Protection Agency:
   - *Manual: Wastewater Treatment/Disposal for Small Communities*, EPA/625/R-92/005.
   - *Summary Report: Small Community Water and Wastewater Treatment*, EPA/625/R-92/010.