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# Fleet Public Health

Navy Environmental Health Center, Norfolk, VA



Navy Environmental and Preventive Medicine

Unit No. 2, Norfolk, VA - Unit No. 5, San Diego, CA - Unit No. 6, Pearl Harbor, HI - Unit No. 7, Sigonella, IT

Vol. 1, No. 1, January 1996

NEPMU-7 Sigonella Edition

Route To:

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## Preventive medicine support for project *Uje Kristal*, Albania

In early July of last year, Navy Environmental and Preventive Medicine Unit No. 7 (NEPMU-7) was tasked with assessing the preventive medicine needs of a U.S. State Department project in the Balkan country of Albania. As one of two staff Environmental Health Officers, I was assigned the task of making that assessment.

A Joint Task Force (JTF) comprised of active duty Seabees from Rota, Spain, a South Carolina National Guard Unit, a reserve Marine Corps Detachment, and a smattering of other reservists was assigned the task of upgrading an

Albanian military trauma hospital in the city of Tirana. The title of the project was *Uje Kristal*, which means "clear water" in Albanian. The projected length of the project was estimated to be three months.

This was the first project of its kind in a former Soviet block country. It was also the first time a Joint Task Force consisted of these different types of U.S. military units. There was high level interest in this project from the Executive Office and considerable media coverage was apparent throughout its duration.

When I arrived the Seabees were in the process of constructing the JTF base camp. The camp was located approximately one mile from the hospital on an old grape vineyard next to a civilian airfield. There was no water/sewer available at this location.

The total size of the JTF was approximately one hundred twenty personnel. Berthing consisted of GP-medium tenting. Drinking water was bottled. Food sources were initially MRE's and T-Rations. Burn-barrel latrines and urine soakage pits were utilized for

Continued on page 2

### Inside this issue ...

Preventive medicine support for project <i>Uje Kristal</i> , Albania.....	1
From the OIC .....	1
Drydock repairs at NEPMU-5.....	1
DoD Pesticide Applicator Training .....	3
JP-5 exposures aboard ship.....	3
Infectious medical waste disposal .....	4
EPA's waste minimization national plan .....	5
Ebola .....	6
P5010, Chapter 6 .....	7
Epidemiologic and Industrial Hygiene evaluation in Qatar .....	8
Waste Generation: Did you know...? .....	9
Operational Preventive Medicine Course .....	9
Clinical Lab supports ops in Zimbabwe .....	9
Retrograde agricultural washdowns: The evil necessity .....	10
Pest control in Environmental Health Surveys .....	11
From the S.E.A. ....	11
Hail and Farewell .....	12

### From the OIC:

Welcome everyone to the first edition of Fleet Public Health (previously Fleet Health Bulletin). We all hope each of you had safe and happy holidays!

NEPMU-7 recently completed our Homeport Relocation from NSA Naples to NAS Sigonella last June after 3 years of aggressive planning and 6 months of intense preparations. The move went fairly smooth but we still continue to find ourselves adapting to our current environment and challenged by water leaks in our new roof, daily intermittent power outages, water seeping through the walls in the EH and EPI offices, recently installed permanent phone lines 5 months after our arrival, and a newly installed LAN with computers with minds of their own and "periodic"

Continued on page 3

### Drydock repairs at NEPMU-5

From December 1995 through April 1996, NEPMU5 will be in the dry dock having the main deck amidships replaced. This yard period will primarily affect the Industrial Hygiene, Entomology, NAVOSH and Microbiology departments.

The phone lines to NEPMU5 will remain the same during the overhaul period, but operations may be curtailed.

We regret any inconvenience this may cause. For more information call:

**ENS Dan Goad**  
**COMM: (619) 556-7080**  
**DSN: 526-7080.**

E. L. Smith, CAPT, MSC, USN, Officer In Charge, NEPMU-5

**Project Uje Kristal, continued from page 1**

waste disposal. Showers were constructed with soakage trenches for wastewater disposal. Shower water was provided by the local utility that hauled it in by truck which was then treated by a ROWPU unit which the Seabees operated. Solid waste was collected by a local contractor.

Due to the long duration of the project, preventive medicine support was determined to be necessary to monitor and maintain a sanitary and safe base camp.

Another factor in my recommendation was the nature of the hospital project itself. The hospital had no water/wastewater services. The staff and patient latrines had very few fixtures for waste disposal and handwashing. There was also very little opportunity for disinfecting patient treatment areas. The nosocomial infection rate for the hospital was nearly 100%.

Since replacement of the existing sewer lines could potentially expose JTF personnel to infectious diseases, monitoring the work project itself was necessary from an occupational health standpoint. The Preventive Medicine Technicians (PMTs) could evaluate and monitor the personal protective equipment (PPE) being used and the disinfection of tools, clothing, and PPE after use.

Medical records review and updating vaccinations for JTF personnel were another preventive medicine function.

The Seabees drilled two wells for a water source for the hospital. Monitoring the bacteriological and chemical quality of the water was another preventive medicine function that could be utilized during this project's evolution.

NEPMU-7 provided preventive medicine support by rotating 3 PMTs at two to three week intervals until the project was completed.

As anticipated, certain situations did arise during the project's duration. Insects and rodents were a concern at various intervals. For most of July, the weather was very hot and dry and insects generally were not a problem.

In the beginning of August, however, locusts started to appear. These were not ordinary run of the mill locusts. These were the size of small birds.

Posing more an aesthetic problem than a health problem this brought much attention in the camp.

In the middle of August it started to rain very heavily and mosquitos were beginning to become evident. Ultra Low Volume (ULV) sprayers were provided by the Seabees. PPE in the form of DEET lotion and mosquito netting were used extensively. One problem noted was the improper use of mosquito netting among the JTF personnel at night which allowed mosquitoes to enter inside the netting. After proper instruction this problem was soon corrected.

Rodents became a problem in berthing areas and traps were set which generally controlled the problem. The rodent problem was due in part to personnel storing and eating MRE's in berthing areas. It was recommended that all eating be conducted in the designated mess tents.

There were certain establishments in the city of Tirana that were deemed safe to eat at by the U.S. Embassy. Liberty in the evenings allowed JTF personnel the opportunity to patronize these establishments. The PMTs at times were requested to make inspections of certain other eating establishments to evaluate the risk of foodborne illness.

The camp medical staff worked with the PMTs on any unusual occurrences of illness during the project's duration. Only one sexually transmitted disease was noted. Diarrhea was the most common problem and was attributed to many reasons and not by a common source.

The hospital project went well from a preventive medicine standpoint. Once the wells were drilled the PMTs performed bacteriological testing on the well water. A chemical analysis was arranged through a local Italian lab near Sigonella.

The Albanian project Uje Kristal was a first of its kind. The project was a major step in bringing former adversaries together into a more cooperative and trusting relationship. To be involved in a project of this nature was certainly a rewarding as well as a learning experience.

**J. R. Bush, LT, MSC, USN, Environmental Health Department, NEPMU-7**

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## DoD Pesticide Applicator Training

Attention all you PMTs whose pesticide certification is about to expire. The Navy Disease Vector Ecology and Control Center, Jacksonville, is offering, for the first time ever, training in category 8 - Public Health Pest Control at NEPMU7, Sigonella, Italy, for the spring/summer of 1996.

We recognize a need that is not presently being met. By offering this training opportunity annually for the next three years, then every other year thereafter, we are hoping this will make it easier for you OCONUS PMTs to maintain your certification.

To meet your needs, we will offer training for both category 8 recertification and certification. Those who merely need to be recertified will complete training in two days. PMTs who have had their certification lapse will have to attend a two-week training session. It is essential that you provide your certification number and expiration date with your quota request.

Send your official quota request directly to:

**OFFICER IN CHARGE  
NDVECC ATTN TRAINING DEPT  
PO BOX 43 NAS  
JACKSONVILLE FL 32212-0043**

Point of contact is Mr. Frank DeMasi at:

**DSN: 942-2424  
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Email: dvj0ccj@bumed30.med.navy.mil**

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### From the OIC, continued from page 1

WAN connectivity to the local Naval Hospital.

Despite it all, the staff have all adjusted to the move and really do like living in Sicily. Access to military airlift has greatly improved with our proximity to the Mediterranean air hub here at Sigonella, the prime reason for our relocation.

The folks here at the Unit have been busy since our arrival last June with deployments and TAD to Albania (5), Zimbabwe, Bahrain, Qatar, and Cairo. LCDR Hendrick (Epi) was assigned just after Christmas to EUCOM JTF staff in Stuttgart, Germany for a period of 179 days for Operation Joint Endeavor. We surely miss him and look forward to his return this summer.

We want you to know our new address, phone numbers, and email listings in case you have missed the message traffic:

**NEPMU7  
PSC 824 BOX 2760  
FPO AE 09623**

**COM (from the States): 011-3995-56-4101/4099/3783  
DSN: 624-4101/4099/3783**

**COM FAX: 011-3995-56-4100 FAX DSN: 624-4100  
Email: sig1rcc@sig10.med.navy.mil (for the OIC)**  
(substitute the "rcc" for the three initials of anyone here)

We look forward to your visit if you happen to get out this way. Stop by and see us at NAS I - you can't miss us - just ask for directions to the 'Old McDonald's Building.' "Would you like french fries with that order"?

**R. C. Culpepper, CDR, MC (FS), USN, Officer in Charge, NEPMU-7**

## JP-5 exposures aboard ship

The use of aviation fuels JP-4, JP-5 and JP-7 is essential aboard the many naval vessels that carry aircraft. Whether it is fighter aircraft aboard a carrier, or helicopters on assault vessels and MSC ships, each ship must have the ability to store needed fuel in tanks specially designed to hold aviation fuel. The fuel must be filtered on the ship before being transferred to the aircraft.

"Sounding tubes" are pipes that provide direct access to the various fuel tanks, and are located throughout the ship. A weighted metal tape is dropped through these tubes into the tank allowing the person "taking soundings" to read the fuel level in the tank. Some ships have magnehelic gauges and electronic devices and do not use sounding tubes. Many ships do not have magnehelics, or may use both methods for checking fuel levels.

Soundings allow a "by sight" verification during tank fueling operations, confirmed using the sound-powered phone. The person taking soundings will be in constant communication with V-3 (Aviation Fuels Division), the Supply Officer and Air Boss to notify them when the tanks are nearly full. When a tank is filled, the fuel will be either diverted to another tank, or the Bos'n may direct the fuel supply hose from the supply ship be switched to a different on board fill station, or operations will be secured. Filling of tanks on a large ship can take 40 to 90 minutes depending on weather conditions and the speed of fuel transfer from the supply ship.

There have been several reported instances of "blow-back", or fuel vapors and fuel escaping from sounding tubes under pressure, due to the filling of the tank. The V-3 representative assigned to take soundings must look into the tube to drop the sounding tape, and will receive these pressurized vapors full in the breathing zone.

Personal sampling measurements for JP-5 aboard a Forrestal class carrier have shown several measurements above the recommended Short Term

**Continued on page 4**

**JP-5, continued from page 3**

Exposure Limit (STEL) for JP-5, recommended by NEHC at 1800 mg/m<sup>3</sup> for any 15 minute period. Personnel were reluctant to wear respirators because they felt they couldn't "see the tape". Soundings must be done quickly, especially as the tank nears the fill level.

Measurements at sounding tubes noted for high blow-back levels showed a decrease by one-third to one-half if the worker used a cloth rag to block the tube opening while the tape was in place, removing the rag only to withdraw the tape for a reading.

Other sources of exposure to JP-5 include pump rooms, during aircraft refueling operations, and filter rooms. Measured JP-5 levels in filter rooms included 28 and 33 mg/m<sup>3</sup> as an 8-hour Time Weighted Average (TWA). For comparison, the recommended TLV for an 8-hr TWA for a closely related hydrocarbon compound, VM&P Naphtha, is 1370 mg/m<sup>3</sup>.

Much information remains to be learned about the long-term effects of distilled hydrocarbons on human organ systems. Respiratory problems, neurological and skin disorders and chronic liver disease are all potential health effects derived from long term exposure to high levels of kerosene and naphtha compounds. Personnel should be especially aware of the need to prevent prolonged skin contact with spilled fuel, and change coveralls that have become soaked in fuel as soon as possible. Protective eyewear is also a requirement due to the pressures involved in pumping and transferring fuel from supply ship to holding tank to aircraft.

For the many female workers now working in the aviation community throughout the Navy, reproductive concerns from over-exposure to various solvents and hydrocarbons also should be considered. The cognizant industrial hygienist, senior medical officer and local EPMU should be consulted for advice and current protective equipment requirements whenever there are concerns. Supervisory personnel should be aware of the hazards from working with aviation fuel, and ensure that persons under their supervision are kept protected and well-informed.

**J. A. Formisano, Jr., LCDR, MSC, USN, Head, Occupational Health Department, NEPMU-7**

**Infectious medical waste disposal**

The last time you were autoclaving your infectious medical wastes and carefully repacking them in those rigid containers marked "BIOHAZARD", you may have asked yourself, "Why am I going to all this trouble?" The answer is simple, and is based upon good scientific data compiled by the United States Agency for Toxic Substances and Disease Registry (ATSDR). You control your medical wastes so those few workers at greatest risk from an accidental cut or needle stick are protected from preventable infections, such as Human Immunodeficiency Virus (HIV) or Hepatitis B Virus (HBV).

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*The public worried  
about catching  
infectious diseases from  
medical wastes washing  
up on beaches*

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This article has two interesting bits of information about the risks of handling infectious medical wastes. First, you will find out WHO is most at risk for contact with infectious medical waste, and second, the ATSDR estimates for the annual incidence of HIV and HBV infections from medical waste exposures. Finally, the Navy's rules ashore and afloat for Infectious Medical Wastes Management will be summarized.

Back in the 1980's, the public became increasingly concerned about catching infectious diseases from medical wastes,

which were washing up on public beaches. The Congress consequently passed the Medical Waste Tracking Act in 1988. The act required the ATSDR to study medical wastes in detail, and to report back to Congress on the potential for infection and injury to the public from exposure to medical wastes (1).

The resulting ATSDR study was very thorough and well founded on scientific data. The ATSDR defined medical wastes as the following: cultures and stocks, pathological wastes, blood and blood products, sharps, animal wastes, selected isolation waste and unused, discarded sharps (because no one can tell if they are contaminated or not) (2).

Who is most at risk? The ATSDR defined the high risk jobs as janitorial and laundry workers, nurses, emergency medical personnel, and refuse workers. For an employee to actually acquire an infection, several events have to happen. The person must first have contact with the waste material, and second an injury must make a portal of entry, or a portal of entry must already exist. Third, a large enough number of viable infectious organisms must enter a susceptible body through this portal of entry. These organisms must finally cause an infection. Not all infections cause overt disease. So, this individual may or may not get sick from the infection (2).

The odds seem to be against a worker getting an infectious disease from medical waste. However, one such case is on record with the ATSDR, a housekeeper in a hospital developed staphylococcal bacteremia and endocarditis after a needle injury (2).

What are the ATSDR estimates of the incidence of HIV and HBV infections in the United States each year from medical wastes? Through a series of surveys in cooperation with Federal and State health agencies, extensive reviews of the scientific literature, and statistical analyses, the ATSDR estimated that, theoretically, one to four cases of Acquired Immune Deficiency Syndrome (AIDS) could occur per year from contact with medical waste sharps in the United States. However, Hepatitis B virus (HBV) is more efficiently transmitted than HIV and is estimated to be more prevalent in hospitalized patients. Therefore, the estimated number of HBV infections per year in the U.S. from medical waste contact is 162-321 HBV infections (2).

Those are the estimated numbers of infections, but you and I can prevent many of them. What can we realistically do? First, we can make sure all high-risk Medical

**Continued on next page**

**Infectious medical waste, continued from previous page**

Department personnel, including civilian health care workers and volunteers are given Hepatitis B vaccine, as required by instruction (3). You notice that laundry workers and housekeepers are not absolutely required by instruction to have Hepatitis B vaccine. By implication, they should if directly exposed to blood. Contract workers are not required to get anything that is not in their contract (3). Second, we can continue following the Navy's guidance on safe management of infectious medical waste.

Here is a summary of the requirements. Aboard Navy ships, infectious medical wastes must be steam sterilized, suitably packaged, and stored for disposal ashore. No discharge overboard is authorized inside 50 nautical miles (nm) of shore. If health and safety are threatened, steam sterilize, package and label, weight for negative buoyancy, log, and discharge the wastes farther out than 50 nm. Still no discharge is authorized at sea for sharps, and they must be retained on board until disposed of ashore. These requirements are listed in references (4) and (5).

Medical waste handling ashore is regulated by each state and by agreements with host governments overseas (4). However, requirements in general are published by the Navy Bureau of Medicine and Surgery in reference (6). As an overview, the infectious medical wastes must be segregated at the point of origin, usually in red biohazard bags and sharps in rigid sharps containers. These bags and containers must be marked with the universal biohazard symbol and the word "BIOHAZARD." Requirements for packaging and handling, transportation, treatment and disposal, record keeping and training are listed in reference (6).

The following table lists the different methods of treatment and disposal of infectious medical wastes (6):

<b>Types of Infectious Wastes</b>	<b>Methods of Treatment</b>	<b>Methods of Disposal</b>
Microbiological	Steam Sterilization Chemical Disinfection Incineration	Sanitary Landfill
Pathological	Incineration Cremation Burial	Sanitary Landfill
Bulk Blood and Other Potentially Infectious Liquids	Gelatinization	Sanitary Sewer Sanitary Landfill
Sharps in Sharps Containers	Steam Sterilization Sanitary Incineration	Sanitary Landfill

Gelatinized blood must be further treated by steam sterilization or incineration. Autoclaving by steam under pressure requires a temperature of 121 degrees Celsius (250 degrees Fahrenheit) for at least 90 minutes at 15 pounds per square inch of gauge pressure.

This article gave you some interesting background on the risks of handling infectious medical wastes, and the Navy's policy on medical wastes was summarized. You will probably find variations and stricter rules for medical wastes in some states and in Final Governing Standards for environmental compliance overseas. Wherever we are, if we follow the Navy's policy guidance, we will prevent most if not all infections from contact with infectious medical wastes.

**J.A. McGinnis, CDR, MSC, USN, Head, Environmental Health Department, NEPMU-7**

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3. NAVMEDCOMINST 6230.3, Immunizations and Chemoprophylaxis.
4. OPNAVINST 5090.1 series, Environmental and Natural Resources Program Manual.
5. OPNAV Publication P-45-113-93, Afloat Medical Waste Management Guide.
6. BUMEDINST 6280.1 series, Management of Infectious Waste.

# EPA's waste minimization national plan

**W**aste disposal, both hazardous and non-hazardous, is one of the nation's toughest environmental challenges. With landfills closing and disposal costs and enforcement regulations increasing, waste minimization is a must. United States industries generate close to 12 billion tons of waste annually, and in 1993, approximately 235 million tons of that waste was hazardous. Waste minimization includes source reduction and environmentally sound recycling. The U.S. Environmental Protection Agency (EPA) has developed a Waste Minimization National Plan that outlines major goals for national hazardous waste reduction. The Plan has three goals:

1. To reduce the presence of the most persistent bioaccumulative, and toxic material by 25% by the year 2000 and by 50% by the year 2005.
2. To avoid transferring these materials across the environment.
3. To ensure that these materials are reduced at their source, whenever possible, or when not possible, that they are recycled in an environmentally sound manner.

To find out more information on waste minimization or to receive a copy of the Waste Minimization National Plan, call the EPA RCRA Hotline at 1-800-424-9346 M-F from 0900-1800 EST.

*Reference:*

PIG Technical News and Views, Vol. 3, 1995

**N. Godfrey, CDR, MSC, USN, Head, Industrial Hygiene Department, NEPMU-5**



# Ebola

The virus kills nine out of ten of its victims so quickly and gruesomely that even biohazard experts fear it. It can do in ten days to a potential victim what it takes The Human Immunodeficiency Virus (HIV) up to ten years to accomplish. It is a highly infective, Biosafety Level 4 Containment virus requiring the use of disposable scrubs, positive air pressure space suits, negative pressure lab and chemical disinfectants for decontamination in order to work safely with it. It is a molecular shark with no vaccine to prevent it and no cure outside of biocontainment. HIV by comparison is only a Biosafety Level 2 Containment virus.

It is the virus, Ebola Zaire.

*"... Ebola Zaire attacks every organ and tissue in the body except skeletal muscle and bone ... a molecular shark ... small blood clots appear in the bloodstream, and the blood thickens and slows, and the clots begin to stick to the walls of blood vessels."*

*"... This shuts off the blood supply to various parts of the body, causing dead spots to appear in the brain, liver, kidney, lungs, intestines, testicles, breast tissue (of men as well as women), and all through the skin."*

*"The skin develops red spots ... which are hemorrhages underneath the skin ... It multiplies in collagen ... collagen in the body turns to mush, and the underlayers of the skin die and liquefy. The skin bubbles up into a sea of tiny white blisters mixed with red spots ... the skin skin goes soft and pulpy, and can tear off if it is touched with any kind of pressure."*

*"... literally every opening in the body bleeds, no matter how small ... Ebola attacks the lining of the eyeball, and the eyeballs may fill up with blood ...."*

*"The liver bulges up and turns yellow, begins to liquefy, and then cracks apart. The cracks run across the liver and deep inside it, and the liver completely dies and goes putrid ... the kidneys become jammed with blood clots and dead cells and cease functioning. As the kidneys fail, the blood becomes toxic with urine. The spleen turns into a single huge, hard blood clot the size of a baseball ...."*

*"... After death, the cadaver suddenly deteriorates; the internal organs ... have already begun to dissolve ... and the fluids that leak from the cadaver are saturated with Ebola-virus particles."*

The above passages from the book *The Hot Zone*, by Richard Preston, sound like they may have come right out of the latest science fiction best seller about a monstrous killer virus. The Ebola hemorrhagic fever virus, however, is real. The virus was named for the Ebola River in Zaire that runs close to areas where outbreaks of the disease have occurred. And the devastating effect it has on the human body is that of a biological meltdown.

“

***... literally every opening in the body bleeds, no matter how small ... Ebola attacks the lining of the eyeball, and the eyeballs may fill up with blood ....***

”

## Background

Ebola belongs to the filovirus family which includes the Marburg virus. When viewed under an electron microscope the virus looks like a string or thread, hence the name “filo”, meaning thread-like. These strings can be squiggly, or at times may resemble worms. The classic shape looks like an eyebolt or shepherd’s crook. The virus is a single strand of RNA surrounded by mysterious protein structures giving it a segmented rope-like appearance. Several subtypes of the virus have been identified and named for the geographic areas where outbreaks have occurred. These are the Ebola Sudan, with a mortality rate of 53%, Ebola Zaire, with a mortality rate of 88% as well as Ebola Reston, which to date has not proved pathogenic to humans.

The incubation period may range from 2 - 21 days. Early symptoms include a fever, headache and sore

throat. As the disease progresses vomiting and diarrhea are common. The source of the virus in nature and the mode of transmission to humans still remain a mystery despite the best efforts of the Centers for Disease Control and Prevention (CDC), World Health Organization (WHO) and others to locate a reservoir. Health officials have tested thousands of specimens from animals and insects that victims may have been exposed to in the outbreak areas; all have been negative for Ebola virus so far.

Ebola is spread through close personal contact with an infected person. Transmission is most common among the hospital workers and friends or relatives caring for the victim who come in direct contact with blood and body secretions. The virus has also been spread by contaminated hypodermic needles being reused in the treatment of patients. The virus can also be spread through sexual contact. Patients who have recovered from an illness caused by Ebola virus do not pose a serious risk for spreading the infection. However, the virus may be present in the genital secretions of such persons for a brief period after their recovery, and therefore may be spread through sexual contact.

To date there have been a total of five outbreaks of the Ebola virus. The first two outbreaks were in 1976: one near Yambuku in Zaire and the other in western Sudan. These were large outbreaks involving a total of 550 cases and 340 deaths. The third outbreak occurred in 1979 in Sudan with 34 cases and 22 fatalities. The fourth outbreak occurred in early 1995 in Kikwit, Zaire with a total of 297 cases and 234 deaths. The initial case was believed to have been a person who came into the Kikwit hospital for surgery. Another outbreak of Ebola limited only to rhesus monkeys occurred at an animal quarantine facility in Reston Virginia in the winter of 1989. The subtype, named Ebola Reston, was infectious through airborne transmission to non-human primates. Although specific antibodies developed in four out of five animal handlers, not a single human case of Ebola resulted. The animal quarantine facility has since been disinfected and leveled.

## Prevention

Preventive measures recommended from Morbidity And Mortality Weekly Report, Vol. 44 dated June 1995 include:

1. Careful monitoring of any or all people who have traveled in the specific area of a country where Ebola has recently occurred, handled or had direct contact with blood or body fluids, secretions or excretions of a person or animal with Ebola; or worked in a laboratory or animal facility that handles hemorrhagic fever illnesses. The likelihood of acquiring Ebola is considered extremely low in persons who do not meet any of these criteria. And careful consideration should be given to other more common infectious diseases such as malaria or typhoid fever in persons presenting with a fever and headache.



*A single Ebola-virus particle.  
Magnification:  
112,000 times*

2. Most of the outbreaks were centered in and near medical treatment facilities with inadequate medical supplies and unsterile technique and instruments which helped to rapidly spread the virus. Patients hospitalized with symptoms of Ebola should be placed in private negative air pressurized rooms with nonessential staff and visitors kept to a minimum. Caretakers should use barrier methods to prevent skin or mucous membrane exposure. All persons entering the patient's room should wear gloves, a mask and gown to prevent contact with items or environmental surfaces that may have become soiled. Face shields, goggles and respirators with high efficiency particulate air (HEPA) filters should be worn around patients with a prominent cough, vomiting, diarrhea or hemorrhaging. All barrier protection should be removed and disinfected.

3. Universal precautions should be observed when handling any infectious materials, needles or other sharp objects. These objects should be autoclaved or immersed in a suitable germicide. Environmental surfaces or inanimate objects contaminated with blood should be disinfected with an EPA registered disinfectant or household bleach.

Will there be future Ebola outbreaks? There is a high probability that yes, we probably will see Ebola again given much of the mystery surrounding its cause. Without knowing what the reservoir is a control method is impossible to establish. Ebola virus is just one example of a group of life threatening, emerging infectious diseases such as AIDS, multi-drug resistant tuberculosis and the Hantavirus that have arisen in the past two decades to challenge modern medicine.

Are there any new developments for treating Ebola? Dr. Peter B. Jahrling, Senior Research Scientist at the U.S. Army Research Institute for Infectious Diseases (USAMRIID) in Ft. Detrick, Maryland stated that ongoing studies at USAMRIID involving lab animals using an equine immunoglobulin G with a high concentration of antibodies gave mixed results against Ebola. In guinea pigs the IgG protected them when treatment was initiated immediately after inoculation with Ebola. However, when IgG treatment was delayed until the guinea pigs became sick (four days after inoculation), all the animals died. Studies done with experimentally infected monkeys given IgG simultaneously with Ebola virus also gave varied results. Five days after inoculation all virus-inoculated control monkeys were clinically sick with high concentrations of the virus in their blood. Monkeys inoculated with Ebola virus and IgG-treatment at the same time remained healthy five days later with no detectable infection in their blood. However, two days later the IgG-treated monkeys became sick and developed viremia like the control monkeys, and within two more days all IgG monkey recipients died with virologically-confirmed Ebola virus fever.

Dr. Jahrling said the beneficial effect of the IgG suppressing viremia for five days suggests that a supplemental injection of IgG given between the fifth

## P5010, Chapter 6

Recent Environmental Health Surveys found several instances of shipboard personnel misinterpreting the guidelines set forth in P-5010, Chapter 6. Most of the confusion centers on the need to test potable water for a halogen residual before transferring the water into the ship's tanks or distribution system.

Article 6-6 discusses "approved sources" of water. The general quality of water from an approved source is considered to meet the U.S. drinking water standards. A test for halogen (Chlorine/ Bromine) residual before hook-up is essential to ensure that chlorine or bromine is present. The absence of a residual suggests the presence of a halogen demand that may be due to contamination of the water supply.

Quality standards of "unapproved sources" providing fresh water are considered questionable. Water from an unapproved source must be chlorinated or brominated to provide at least 2.0ppm halogen residual at the end of a thirty minute contact time.

For further information, contact the Environmental Health Department at any Navy Environmental and Preventive Medicine Unit.

**CAPT C. Stein, Head, Environmental Health Department, NEPMU-2**

and seventh day is worth testing. However, there is some concern that a second IgG injection may cause serum sickness. USAMRIID scientists intend to test this hypothesis.

Dr. Jahrling cautions that these IgG studies are only experimental. There are still too many theoretical obstacles in the use of equine IgG in the treatment of human Ebola fever cases to promote much optimism at this time. He does, however, add that if the equine IgG proves the principle that antibodies have a place in Ebola treatment, the stage will be set to develop second generation therapeutic strategies using bio-engineered forms of human antibodies.

**L. F. Maranzana, HM1, USN, Industrial Hygiene Department, NEPMU-6**

*Reference:*

R. M. Preston (1994) *The Hot Zone*. New York: Random House, Inc. ISBN 0-679-43094-6



## Epidemiologic and Industrial Hygiene evaluation in Qatar

On 25 September 1995 at 0230, NEPMU-7 received a call from the Joint Task Force Commander (JTFCOM) requesting our assistance at Exercise Indigo Desert in Qatar (1st MEF Marines).

The exercise began about 4 days earlier at Umm Sa'id, a deep water port south of Doha, Qatar with approximately 20 Marines working pier-side. This Exercise involved the off-load of a Maritime Prepositioned Supply (MPS) ship and a live fire exercise (FEX) at a remote site inland from the Arabian Gulf. Over the next 2-3 days, 12 of 20 Marines working pier-side developed symptoms including headache, eye and respiratory irritation, and dermatitis suggestive of environmental exposure to byproducts from a large industrial area upwind from the pier.

It was initially reported that in this area were a steel manufacturing plant and a chemical fertilizer plant with "easily seen particulate matter in the air." There were reportedly abundant mounds of ash on the ground from these plants with very little ground vegetation near the pier. The affected members were initially evaluated by a corpsman and subsequently by the GMO on scene. An on-site exercise-attached Science Technology Advisor suggested to the JTF Commander that he thought perhaps there may be arsenic and/or lead in the air causing the illnesses.

The MPS off-load was suspended pending evaluation of health risks associated with possible exposures to industrial effluent or other occupational hazards in the area. The on-site JTF Commander needed answers immediately to determine whether to cancel the exercise or continue with a critical MPS ship unloading. Within 7 hours of the initial phone request, LCDR Jerry A. Formisano, Jr., Industrial Hygienist and LCDR Byron Hendrick, Medical Epidemiologist were deployed to the Exercise to perform an evaluation of the health risks and provide consultation to the JTF Commander regarding recommending the Operation.

Area industries were surveyed and potential exposure to hazardous materials was evaluated. The industries of most concern was a steel mill located approximately 300 meters from the pier

and several petroleum refineries visible in the distance. There were large amounts of raw materials adjacent to the steel mill.

The 1st FSSG had arrived just days earlier on military charter aircraft from Camp Pendleton, CA directly to Qatar. During the initial phase of the MPS off-load, an increase in smoke, dust, or mist was reported in the pier area. This

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“  
*There was concern  
 that industry  
 in the area could cause  
 elevated levels of  
 SO<sub>2</sub> or NO<sub>2</sub>*  
 ”

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caused concern at the command level when several personnel working in the environment complained of eye irritation and respiratory problems. A total of thirty-four Marines were initially evaluated by the FSSG Medical Officer. While 32 of 34 personnel complained of some symptoms there were no persistent physical findings or symptoms.

The initial assessment of potential exposure to hazardous materials began when the 1st FSSG EHO collected a soil sample prior to our arrival. This sample was forwarded to an EPA-approved lab in Bahrain where analysis was done for heavy metals, including lead and arsenic. The results of these analyses indicated there was no likely potential exposure to any of these materials, and a recommendation to proceed with the MPS off-load was forwarded to the JTF Commander.

There was concern that industry in the area could cause elevated levels of SO<sub>2</sub> or NO<sub>2</sub> which might account for irritation of mucous membranes and some mild dermatitis after prolonged exposure so we continued the evaluation for possible adverse occupational exposures during the MPS off-load. Several pier-side personnel were sampled for total and respirable fraction of dust in the environment, and a

portable infra-red spectrophotometer was used to monitor levels of SO<sub>2</sub> as a marker for general industrial airborne pollutants. Additional soil samples were collected for analyses at the EPMU-2 Consolidated Industrial Hygiene Lab. All sampling and subsequent lab results suggested that there was no pier-side exposure to industrial effluent or other occupational hazards in the area. However, during our on-site evaluation, the weather was clear without any noticeable air pollution.

The epidemiological evaluation first determined whether an epidemic existed. A case definition included anyone with at least one of the reported symptoms above. To determine the likelihood of an association between pier-side exposure and the symptoms, we did a review of all sick call visits and a subsequent case-control study. Neither of these evaluations found any significant association between pier-side exposure and the reported symptom complex. It is also noted that there were no further reported symptoms suggestive of environmental exposures during the remainder of the Exercise.

In our opinion, the initial symptoms experienced by the Marines may have been due to several factors. First, they had just traveled almost 9000 miles in an aircraft conditioned with the usual dry air. Second, the desert environment they were exposed to immediately upon landing contributed to further drying of the mucous membranes with subsequent increased sensitivity to any particulate matter (e.g., dust, sand, etc) in the air. Finally, there may have been a heavier than usual amount of dust, sand, and even SO<sub>2</sub>/NO<sub>2</sub> in the air during the initial days of the MPS off-load contributing to any susceptible Marines developing various respiratory symptoms.

All personnel involved in this Exercise had their participation documented in their health record and are enrolled in post-deployment medical surveillance to follow-up any possible latent symptoms.

This assist visit allowed the integration of an Epidemiologist and Industrial Hygiene Officer to play an integral part in an "outbreak investigation." Investi-

**Continued on page 9**

## Waste Generation: Did you know...?

- The number of landfills in the U.S. will shrink by 45% during the next few years, forcing a reduction in industrial and municipal waste.
- U.S. manufacturers reduced the amount of hazardous waste they generated by 70 million tons during 1991-1993.
- Four states (Texas, New York, Louisiana, and Michigan) generated 70% of the hazardous waste in the U.S. in 1993.
- EPA's waste minimization policies require generators to first reduce waste at its source or eliminate the production of waste, recycle waste whenever possible, and lastly to properly treat and dispose of the waste.
- 62% of the municipal solid waste generated by homes and industry in the U.S. was landfilled in 1993, down from 83% in 1985.

*Reference:* PIG Technical News & Views, Vol. 3, 1995

**N. Godfrey, CDR, MSC, USN, Head, Industrial Hygiene Department, NEPMU-5**

## Operational Preventive Medicine Course

**N**avy Environmental and Preventive Medicine Unit No 5 (NEPMU-5, San Diego) will be conducting the 4TH annual Operational Preventive Medicine Course (OPMC -'96) this coming summer. This course introduces medical personnel to field-based preventive medicine. Course content is based on lessons learned during combat, natural disaster assistance and humanitarian operations.

Upon completion of the OPMC, each student will be able to plan, implement, monitor and evaluate preventive medicine programs that enhance and maintain the readiness of operational forces. Topics included in last years OPMC include: medical intelligence gathering, field sanitation, infectious disease surveillance in the field, entomological surveillance and control, and several retrospective deployment discussions. Also included in the course is a two-day field exercise at Field Medical Service School, Camp Pendleton, CA.

The course is open to all active and reserve medical personnel including medical corps, nurse corps, environmental health officers, independent duty corpsman and preventive medicine technicians. The course has been approved for approximately 60 Category I CME credits.

For further information on course content, please contact CDR Paul Bolduc, MSC, USN, or LT Harold Burke, MSC, USN, at (619) 556-7070, DSN 526-7070.

**Shannon Putnam, LT, MSC, USN, Head, Microbiology Department, NEPMU-5**

### Qatar, continued from page 8

gation of symptoms that are allegedly related to industrial exposure may well become more commonplace. As military operations expand worldwide to include more industrialized areas, and our medical personnel become more aware of the potential hazards associated with exposure to these industries, we should be prepared for similar calls in the future. Unique problems can be encountered with operations in areas where industry has been devastated by war. In these areas acute symptoms from exposure to industrial hazards could affect unit readiness and mission accomplishment. As always, we need to use all our resources to prevent illness and protect our forces whether they are located in the desert, the jungle, or near an urban industrial facility.

**B. Hendrick, LCDR, MC, USN, Epidemiology Department, J.A. Formisano, Jr., LCDR, MSC, USN, Head, Occupational Health Department, NEPMU-7**

## Clinical lab supports ops in Zimbabwe

**M**EDFLAG 95-3 was conducted by the USAF 39th Medical Group from 01-16 August 1995 in Harare, Zimbabwe. The mission of MEDFLAG 95-3 was to train the Zimbabweans in Disaster Preparedness, stage a Mass Casualty Exercise and to perform Medical Civic Action Programs (MEDCAPs). Clinical laboratory support, primarily for the MEDCAPs, was provided by HMC(SW) Kuebitz, Chief Laboratory Technician from the Navy Environmental and Preventive Medicine Unit No. 7 (NEPMU-7) and TSGT Lacalamita, Advanced Laboratory Technician from the Air National Guard. This team proved to be a valuable resource for MEDFLAG 95-3.

The basic goal of the clinical laboratory was to support the physicians during the MEDCAPs. Laboratory services provided on this Zimbabwe MEDFLAG permitted the physicians to make diagnoses and begin treatment with a more complete profile of the patient. The seventy-eight tests performed by the laboratory during the deployment may not seem like very many but were significant to the patients treated.

A typical day for the lab team began by our arrival at an outlying rural clinic or small hospital, a different one each day. After off-loading the equipment and establishing the basic necessities (i.e., power, water, light, waste management), the two lab technicians met with the regional medical administrator to coordinate an introduction with the local lab personnel. Following mutual greetings the request was made to see their laboratory, equipment and reference material which was in most cases minimal or nonexistent.

In one MEDCAP location, there was no laboratory and a registered nurse was given the collateral duty of laboratory technician. In another location a back room with a table and a student quality microscope was all the equipment available. There was no reference library and training consisted of only a four week course in the preparation, staining, and reading of malaria slides.

**Continued on page 10**

**Lab, continued from page 9**

With this being typical of the local laboratory support, I would ask if we could teach them the Gram stain procedure as a way of expanding the laboratory's capability. The answer was always in the affirmative. After a small discussion on the background, staining theory, and procedure, slides were prepared, fixed, stained and viewed. Gram positive and negative reactions were discussed along with a discussion on the importance of recognizing and identifying artifacts. Further training was facilitated by using cow dung to simulate a patient specimen in a parasitology screening procedure that was easily added to their laboratory capabilities.

Upon departing, I offered the local lab excess consumables such as a gram stain kit, a box of slides and coverslips, a few pens and markers, and a laboratory manual. The manual, "The Manual of Basic Techniques for a Health Laboratory" by the World Health Organization, was special because it was much needed and immediately understood. Of all the gifts offered, that manual made the strongest impact due to the apparent scarcity of books.

In conclusion, the addition of a clinical laboratory in MEDFLAG deployments does have a strong positive impact. Support to our physicians is important and with the possibility of adding even more procedural training, the clinical laboratory would definitely provide broader education opportunities for the local laboratory personnel. There certainly appears to be a desperate need in this area.

The NEPMUs stand ready to deploy on future MEDFLAGS with enthusiasm and imagination to make military and civilian contacts truly meaningful. By strengthening the bonds of friendship between emerging nations and the United States, the promise of future cooperation in the times of crisis are powerful factors for success. The time and money invested means friends and allies abroad.

**H. F. Kuebitz, HMC (SW), USN, Laboratory Department, NEPMU-7**

## Retrograde agricultural washdowns: The evil necessity

In spite of the common opinion that the two most feared evils in this world are death and taxes, most people have not had the wonderful experience of a retrograde agricultural washdown. These little known necessities are also known as USDA military car washes or washdowns. For the uneducated or inexperienced, washdowns are a lot of work, requiring a well trained, USDA certified, inspection team that know the ins and outs of every military vehicle or piece of rolling stock.

Washdowns are an old idea stemming from the Viet Nam War. The general idea is to prevent the importation or introduction of an exotic or noxious pest into the United States. Pests like the Fire Ant, Mediterranean Fruit Fly, or even the aquatic plant Hydrilla are just three of the more publicized pests that America spends millions of dollars annually to control. Worldwide, public health restrictions have long been established. As the world becomes smaller and more cosmopolitan, the potential threat of new or even previously exterminated pests significantly increases.

Due to the military's rapid deployment capabilities globally, special precautions have been established to help prevent the introduction of harmful agricultural or public health agents into the United States. The combined service instruction, SECNAVINST 6250.2/AR 40-12/AFR 161-4, describes DOD support of the Public Health Service and USDA to prevent these introductions. In general, this instruction prohibits the back loading of vehicles and cargo in a foreign country unless free of animal, pest, and soil contamination. DOD 5030.49-R gives customs inspection guidelines for DOD. The recently published Technical Information Memorandum No. 31 on Contingency Retrograde Washdowns (published by the Defense Pest Management Information Analysis Center) is an

excellent reference to utilize prior to planning a washdown.

So how do you know when you need to do a washdown? In short, the rule of thumb is that if the vehicle or cargo touched foreign soil, it has to be washed. It makes no difference how clean the vehicle was, or if there were NO pine trees where you were. Once your vehicle or cargo has touched foreign soil, all dirt, pests, and vegetation is suspect and must be removed.

Washdowns are not a cursory outside spray off. Every nook and cranny on the dirty piece must be cleaned. You must stick your fingers in all the little holes to feel for dirt or vegetation, clean under floor mats, and roll out the cammie netting. Any place you see or feel dirt must be cleaned; each piece of gear wiped down and every grain of sand or blade of grass removed. If you can see it, so can the hawk eye of a trained and certified agricultural inspector.

It is the responsibility of the Commanding Officer to ensure the vehicles and cargo are clean, not the Agricultural inspectors. However, the Ag inspectors have a great deal of experience and can provide guidance to expedite the washdown and assure a more rapid liberty call for all. If you have any questions, preferably prior to deployment and not at the very end of it, contact your local USDA or Navy entomologist at the NEPMUs or DVECCs. They are readily available to answer any questions or provide any assistance.

Remember, the inspector is your friend. So if you ever have to do a washdown and are cursing the Ag inspector under your damp breath, remember the Fire Ant mound in your front yard, and hit that spot under the wheel well with the water hose one more time.

**LT Steven E. Rankin, MSC, USN, Head, Entomology Department, NEPMU-7**

### Prospective Authors:

Have any suggestions? Interested in contributing? Send your articles/comments in now! See page 2 for more information.

## Pest control in Environmental Health Surveys

**A** formal Environmental Health Survey (EHS), or Technical Assist Visit (EHS TAV) evaluates factors directly affecting the health, morale, and general welfare of the ship's crew. Pest Control is one of the specific areas of concern when a shipboard EHS or EHS TAV is conducted. Areas where discrepancies are commonly found are clarified here to assist shipboard medical personnel not only to prepare for the inspection but to maintain an effective shipboard Pest Control Program at all times.

### Recordkeeping

This is the most important aspect of the Pest Control Program. You must document all your actions pertinent to pest control. The SNAP II/SAMS is the most convenient method of recordkeeping. A separate Pest Control Log is also acceptable. Actions such as cockroach surveys, pesticide applications, dry stores inspections, dockside and underway replenishment (UNREP) inspection of subsistence must be completely and accurately documented. A well-organized and properly maintained Pest Control Log is a valuable tool in troubleshooting any pest problems onboard ship.

### Certification

The Senior Enlisted Medical Department Representative (whether or not directly applying pesticides) and all corpsmen responsible for applying pesticides must maintain their shipboard pest applicator certification current at all times. This certificate is valid for one year and is issued upon completion of the training course conducted at the Navy Environmental Preventive Medicine Units (NEPMU's) and the Disease Vector and Ecology Control Centers (DVECC).

### Equipment and Supplies

All ships must maintain on board a hand compressed sprayer for use in applying liquid pesticides, and spare parts to perform minor repairs while underway. The Whitmyre System III, used to apply aerosolized pesticides, is an easy to use and convenient supplement, but current instructions require

that a properly working hand compressed sprayer shall be maintained on board. An adequate amount of approved cockroach flushing agents (CTL, PT 565), and pesticides (Liquid Baygon, PT-279, PT-250), or combination pesticide/flushing agent (D-phen), must be on board. Material Safety Data Sheets (MSDS) for each pesticide kept on board must be readily available to all personnel applying pesticides. For safety, personal protective equipment (PPE) for use when applying pesticides (e.g., coveralls, goggles, respirator and organic vapor filters, nitrile gloves, hardhat) and a spill kit must also be on hand.

### Administration

Several instructions and manuals as a whole or in part, address shipboard pest control. These references contain information that shipboard medical department personnel will find most useful in dispensing their duties as the ship's primary pest management specialists:

- a. **NAVMED P-5010**, Chapter 8, (Rev 9-87) Medical Entomology and Pest Control Technology
- b. **OPNAVINST 6250.4A**, (Nov 90) Pest Management Programs
- c. **SECNAVINST 6210.2A**, (Jan 92) Quarantine Regulations of the Armed Services
- d. **BUMEDINST 6250.12B**, (Sep 93) Pesticide Applicator Training and Certification
- e. **MILSTD 904-A**, (Dec 75) Guidelines for Detection, Evaluation and Prevention of Pest Infestation of Subsistence
- f. **Navy-Wide Shipboard Pest Control Manual** (Sep 86)

C. A. Custodio, JR., HMI(AW/FMF), USN, Entomology Department, NEPMU-5

From the  
S.E.A.



**T**he Centers for Disease Control and Prevention (CDC) offer self-study courses through their Distance Learning Program. Most are free to federal employees and can be used to obtain Continuing Education Unit (CEU) and Continuing Medical Education (CME) credits. Courses include:

- Basic Mathematics in Environmental Health
- Communicable Disease Control
- Vector-Borne Disease Control
- Environmental Protection
- Foodborne Disease Control
- Microbial Ecology of Foods
- Principles of Epidemiology
- Quality Control in Microbiology

Students may enroll individually, or as part of a group study, in which one student volunteers his/her expertise or enthusiasm to act as a Group Leader. To request a catalog and application forms, write:

CDC  
DISTANCE LEARNING PROGRAM  
MAILSTOP F02  
1600 CLIFTON RD NE  
ATLANTA GA 30333  
(404)639-2142 FAX (404)639-0050

HMCS B. Supalla, Senior Enlisted Advisor, NEPMU-6

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