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Office of U.S. Foreign Disaster Assistance

**Feasibility Study
of a
Hospital Ship for Disaster Assistance**



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Executive Summary

The purpose of this study is to analyze the cost-effectiveness of a hospital ship for meeting the Office of U.S. Foreign Disaster Assistance (OFDA) disaster response objectives. The House and Senate Appropriations Committees in report language accompanying the FY 1992 and FY 1993 foreign appropriations, requested the Agency for International Development (A.I.D.) to assess "the feasibility of using a hospital ship to respond to emergencies such as the food and health needs in the Horn of Africa."

This feasibility study on the use of a "hospital ship" for disaster assistance was specifically designed to (1) assess the cost of repairing and refitting the Life International ship, USS Sanctuary, as a hospital ship with modern medical equipment; (2) determine the cost of manning and operating the hospital ship; and (3) determine if Life International's ship is a cost-effective method for meeting OFDA's disaster response objectives.

The American Bureau of Shipping (ABS) ship-condition survey (conducted as part of this feasibility study), as well as the independent assessment obtained by Life International from shipbuilding and drydock companies, indicate that the USS Sanctuary requires significant repair and retrofitting. It is estimated that repairing and refurbishing of the ship will take between one and a half to two years. Repairing and refitting the Sanctuary to make her seaworthy and meet Coast Guard safety standards and marine pollution international treaties will cost between \$18.0 and \$20.0 million. Modernizing the hospital's medical equipment will cost approximately an additional \$2.5 to \$3.0 million. Life International has estimated that it will cost about \$8.5 million per year to operate the ship. However, the incremental cost of operating and maintaining the ship's three helicopters and its mobile self-propelled clinics will push the yearly operating cost to over \$10 million.

After interviewing U.S. private volunteer organizations (PVOs) such as Project Hope, Mercy Ships, West Park Children's Fund, Esperanza and Life International, and the U.S. Navy, this study concludes that a hospital ship does not offer any comparative advantage for disaster assistance. Most hospital ships plan their itinerary a year and half in advance. Because of the time required to disengage from prior commitments and the slower speed of a ship, the response time for disaster mitigation will be slower than the standard response mechanism utilized by OFDA.

Between 1989 and 1992, OFDA has disbursed between \$3.3 and \$19 million annually in medical assistance including medical supplies, medicines, medical personnel, medical transport, medical projects and water and sanitation assistance. OFDA's medical assistance in 1990 would have been only about \$6.3 million when the medical assistance is subtracted for the unusual emergency that emerged in Panama in 1990 as a result of fighting between U.S. troops and General Noriega's forces. And in 1991, when one takes

into account the medical assistance provided to Somalia and the Sudan, the amount of assistance to the rest of the world was only \$5.0 million. In FY 1992, OFDA spent more of its funds to respond to complex, civil strife disasters, of which more money was spent responding to United Nations' appeals and purchasing supplies locally. If Life International were to be the sole vehicle for delivering disaster-related medical assistance, the level of operating expenses it faces suggest that Life International will have to spend between \$1.50 and \$2.00 for every dollar of disaster assistance delivered.

Disasters can occur anytime and anywhere. Whether natural or man-made, they usually require quick response. OFDA, through its relationships with A.I.D. Missions, private voluntary organizations and non-governmental organizations (PVOs and NGOs), and collaborating international organizations, can respond to disaster situations within a matter of hours, and often to multiple disaster locations at the same time. Because of the time it takes to disengage from prior commitments and the slow speed of a ship, it will be nearly impossible for a ship to respond, with the speed necessary, to disasters as they occur, and it would be impossible to be at several different disasters occurring simultaneously. A hospital ship is the least rapid means for delivering disaster assistance.

The delivery of assistance in disaster-stricken areas requires both experience and expertise in disaster relief often under adverse conditions. The private and international organizations through which OFDA channels its disaster assistance have many years of experience and have intimate knowledge of the countries in which they are working. Many have the support of the host government. By contrast, Life International faces a steep learning curve. This means Life International will require more time to get acquainted with the disaster-stricken community in order to lay out and set up the supply/assistance delivery logistics. This undoubtedly will delay OFDA's disaster response and further complicate the situation of disaster victims.

A.I.D.'s health care strategy is geared to developing the capacity of local health institutions and workers and promoting simple, effective, low-cost strategies for combating priority health care problems. The implication of this orientation is that Life International's services with sophisticated treatment facilities and high cost do not support A.I.D.'s health sector. Annex F of this report details A.I.D.'s development health care objectives and analyzes Life International's possible roles in health care development but finds that none of these roles would be cost-effective.

Life International has made the point that a hospital ship is the best vehicle for delivering medical services to the vast majority of the world's poor. Life argues that navigable oceans and inland waterways reach the vast majority of the world's population, particularly, the worst areas of poverty. It further argues that about 70 percent of the world's population lives within 100 miles of navigable waters - on or near rivers, oceans or lakes. Therefore, the world's poor will greatly benefit from a hospital ship. The issue,

however, must balance access to the poor with the cost of service delivery to the poor. Although, a hospital ship supplemented by land and smaller water self-contained vehicles, in principle, reach many of the world's poor, the high cost of operating Life International's hospital ship and its mobile units is prohibitive unless heavily subsidized.

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1. PROJECT BACKGROUND AND RATIONALE

1.1 PROJECT SETTING

In February 1990, Life International, a private voluntary organization, paid \$10 dollars for a 520-foot hospital ship, "the USS Sanctuary," built and used by the Navy. The ship, planned for use as a World War II cargo ship, was laid as Marine Owl on August 15, 1944. It was constructed by Sun Shipbuilding and Drydock Co. in Chester, PA. Due to the need for increased medical care in the Pacific theater, the vessel was converted to a hospital ship by Todd Shipbuilding Co. in Hoboken, NJ and took on the name "USS Sanctuary." The Sanctuary, following her commission on June 20, 1945, sailed to the Pacific on July 31, 1945 only to dock at Pearl Harbor four days after the Japanese surrender.¹ The Sanctuary, participated in returning home hundreds of liberated prisoners of war (POWs) from Japan. After serving for less than a year, on August 15, 1946 she was decommissioned at League Island.

The Sanctuary sat in mothballs for nearly 20 years until the Navy brought her back into action, compelled by the conflict in Vietnam. The Sanctuary was modernized by Avondale Shipyards, Inc. in Westwego, LA, and recommissioned on November 15, 1966. The modernization included a heliport, three X-ray units, a blood bank, an artificial kidney machine, ultrasonic diagnosis equipment, a recompression chamber, and other modern medical equipment. This equipment dramatically increased her capacity to treat casualties on board. On April 10, 1967, the Sanctuary arrived at Da Nang, South Vietnam, admitting 717 patients by the end of the month. Until her mission was completed on April 23, 1971, the hospital ship treated more than 25,000 patients. Sanctuary was again decommissioned on December 15, 1971 and moved to Hunters Point Naval Shipyard, San Francisco, CA. There the ship was converted for use as a dependent's hospital and a commissary naval exchange retail store for use by U.S. servicemen and families in Greece. When Greece withdrew from the North Atlantic Treaty Organization (NATO), the mission was canceled and the ship was retired on January 31, 1975 under dehumidification at the Philadelphia Naval Shipyard. In 1977, the Sanctuary was moved to the Atlantic Reserve Fleet on the James River in Virginia, where she rested until February 1990. Life International took possession of the ship in February 1990 and had her towed to Baltimore, Maryland; she is now berthed at Pier 5, Childs Street, in the Fairfield area.

The Sanctuary's current configuration includes a 50-bed maternity/obstetrics ward, a nursery, an extensive out-patient clinic, three X-ray rooms, three operating rooms and associated support facilities, seven dental chairs, a medical laboratory, a blood bank and

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Richard A. Douglas "New Life for an Old Veteran", Navy Medicine Magazine, November-December, 1990

a decompression chamber. Life International acquired the Navy Reserve ship to provide health care for patients and instruction for host country doctors and paramedics in major Third World ports. Since obtaining the ship, Life International has been soliciting funds to finance the refurbishing and retrofitting of the ship and for operating the refitted ship. Life International has approached members of the U.S. Congress and officials of the Agency for International Development (A.I.D.) (including the Office of U.S. Foreign Disaster Assistance (OFDA)) concerning possible funding for the repair, retrofitting and operation of the Sanctuary. In Senate Report 102-419 accompanying the FY 1993 foreign operations appropriations bill, the Senate Appropriations Committee expressed the belief that "A.I.D. should explore innovative ways to respond to emergencies such as the food and health needs in the Horn of Africa." The Committee cited "the proposal to use a medical ship such as that used by Life International, which could be relocated to address emergency needs at a variety of locations." The Committee requested A.I.D. "to determine whether this would be a cost-effective way to provide this kind of urgently needed assistance to disaster victims."

In House Report 102-108 accompanying the FY 1992 foreign operations appropriations bill, the House Appropriations Committee also expressed the belief that "A.I.D. should look into innovative ways to respond to respond to emergencies, such as the famine and health needs facing the Horn of Africa," cited the Life International proposal, and requested that A.I.D. "look into the feasibility of a program such as Life International."

On March 2, 1993, OFDA convened a meeting of A.I.D. officers to review the Life International proposal. At that meeting OFDA decided that a cost-effectiveness study should be conducted.

1.2 STATEMENT OF THE PROBLEM

The House and Senate Appropriations Committees of the 102nd Congress have requested, in report language, that A.I.D. study the feasibility and the cost-effectiveness of using a hospital ship to respond to emergencies such as the famine and health needs now facing the Horn of Africa. OFDA, under its contract with Basic Health Management, Inc. (BHM), requested that a study be undertaken to determine whether a hospital ship is a cost-effective vehicle for meeting OFDA's response objectives. The study design is to identify the type of health service that A.I.D. provides in both disaster and development situations, and the extent to which a hospital ship can meet those needs cost-effectively.

1.2.1 OVERALL SCOPE OF STUDY

OFDA requested BHM to specifically analyze and assess (1) the cost of repairing, refitting and making Life International's ship seaworthy; (2) the annual operating cost of the ship; (3) the experiences other organizations have had in using hospital ships; and (4)

the effectiveness of using hospital ships for meeting A.I.D.'s various developmental and disaster objectives. Specifically, the study is to assess whether: (a) the ship is a cost-effective way of meeting OFDA's emergency response objectives; and (b) the appropriateness of using the ship in disaster response given the time it would take to move a ship and the likely timeliness of its arrival. The scope of work, included as Annex A, lists the specific questions to be addressed by the study.

1.3. DATA COLLECTION AND ANALYSIS METHODS

Interviews were conducted with various A.I.D. offices (i.e., Office of Health, Bureau of Research and Development, OFDA, and the Center for Development Information and Evaluation); private voluntary organizations (Project Hope, Mercy Ships, West Park Children's Fund, and Life International); the American Bureau of Shipping (ABS); the Maritime Administration; the U.S. Coast Guard; and the U.S. Navy. The individuals interviewed for the study are listed in Annex B.

Various documents were consulted for the study including OFDA's annual reports and A.I.D.'s child survival report to Congress. The papers and reports consulted for the study are listed in Annex C. In addition, the ship was given a "condition survey" by American Bureau of Shipping. The condition survey report is attached as Annex D. The requirements to bring the Sanctuary to ABS class are included in Annex E.

The data gathered from these different sources were collated and analyzed to determine if a hospital ship, such as the USS Sanctuary, is a cost-effective method for meeting OFDA's disaster assistance requirements. The study also has made a preliminary assessment of the cost-effectiveness of using Life International's ship for A.I.D.'s health sector developmental initiatives as requested in the scope of work. This analysis is included separately as Annex F.

2. COST OF REPAIRING AND OPERATING THE SHIP

2.1 COST OF REPAIRING AND REFITTING

The USS Sanctuary is a 520-foot, 11,000-ton, 8-story hospital ship with a 9,000-horsepower oil-fired engine. According to data provided by Life International, the Sanctuary is completely air conditioned with 320 beds; three operating theaters; five intensive-care units; three X-ray rooms; seven dental chairs; a dental operating room; eye, ear, nose, and throat clinic; an obstetrics unit; two delivery rooms; a pharmacy; a medical library; an immunization clinic; a kitchen and dining facilities for 100 people; and a helicopter platform. The ship can hold up to 5,000 metric tons of cargo in its three cargo holds.

The USS Sanctuary has not sailed under her own power since she was last decommissioned on March 28, 1974 and placed as part of the National Defense Reserve. A walk through the ship shows that the ship's engines, generators and navigation equipment were last inspected in August 1976 and June 1977. On August 1978, the Navy transferred USS Sanctuary to the Maritime Administration. According to Mr. George Clark, Jr., Chief of the Division of the Reserve Fleet (who suggested that the physical condition of the ship would depend upon the decommissioning process, and that the ship will need a lot of repair work to make her seaworthy): The hull must be cleaned and repaired; the electrical wiring and plumbing system must be replaced and repaired; the bottom of the ship must be sand blasted, primed and painted; and some generators have to be replaced.

In addition, the cost of conversion and rehabilitation of the ship will greatly depend upon its classification and the Coast Guard certification requirements. According to Life International, the ship will be classed as hospital/passenger ship. There will be some physicians, nurses and patients on the ship while she is at sea. The ship will be documented under U.S. laws and will fly the U.S. flag. To operate as a "passenger ship" under a U.S. flag means that Life International's ship has to satisfy stringent maritime regulations including Safety of Life At Sea (SOLAS) and International Marine Pollution (MARPOL) treaties. Some of the Coast Guard and ABS requirements are listed in Annex E.

Life International's ship has to pass Coast Guard inspection and obtain Coast Guard certification before sailing to sea. The Coast Guard certification involves fitting a sewage treatment plant and maintaining a Coast Guard approved sanitation system, an oil/water separator, an approved method of oil transfer procedures and overboard discharge, approved and inspected life jackets, lifeboats, fire-fighting gear including fire sprinklers, communication equipment and other safety items. Strict compliance with these maritime regulations may require stripping out and rebuilding the ship's accommodation to meet fire safety regulations, even though the accommodations are now in good condition. A walk through the Sanctuary, with an ABS surveyor, confirmed that the Sanctuary does not meet Coast Guard fire safety requirements. She will require major repair work to make her seaworthy. In addition, there is a significant amount of asbestos and lead paint in her hulls and engine rooms which must be removed.

The Sanctuary has a 9,000-horsepower oil-fired engine. This 50 year-old vessel has not sailed under her own power for 18 years. Her seven generators for lighting, cooling, refrigeration, heating, cooking and for operating the hospital equipment have been turned off during this period. Beyond major remodeling work to satisfy Coast Guard standard fire safety requirements, other repair work include:

- Classroom construction;
- Electrical systems activation and repairs;
- Heating, ventilation and air conditioning activation and repairs;
- Ship's refrigeration system activation and maintenance;
- Galleys and mess halls activation, upgrading and maintenance;
- Electronics and ship handling systems installation and repairs, including navigational and ship monitoring;
- Firefighting installations, activation and maintenance;
- Lifeboat and raft installation;
- Sewage handling and treatment system installation;
- Clean and paint exterior hull and superstructure;
- Interior cleaning, painting decks and fittings; and
- Outfitting all medical and health facilities with current standard equipment.

In addition, the Sanctuary will require drydocking for underwater mechanical repairs and for a complete **drydock service**. Drydock services are considered normal shipyard services and are required every two years. Drydock services include:

- cleaning (sand blasting or sand sweeping), priming and painting the bottom of the ship; and attaching zinc anodes to the bottom of the ship;
- checking the rudder bushing, and checking and draining the rudder;
- checking the propeller shaft, inspecting the stern tube bearings, removing and replacing the rope guard; and cleaning the propellers;
- removing and replacing suction strainers from sea chests; disassembling, inspecting, and repairing sea chest valves; checking, cleaning, priming and painting sea chests;
- checking the anchor and chain;
- underwater mechanical repairs and maintenance;
- underwater hull cleaning, painting, maintenance, and repairs;
- main propulsion activation and repairs (boilers and main engines); and
- hiring a surveyor to give independent report for insurance and other purposes.

The wheelhouse (bridge) navigation and communication equipment need upgrading with more modern electronic equipment. According to Life International, repairing, refitting and putting the Sanctuary back to a seaworthy condition will cost over \$18.5 million.

Much of the technical and medical equipment, culinary and surgical equipment in the three operating rooms, dental rooms, maternal ward, and kitchen remain in good shape, although they are circa 1970. According to Life International, which plans to use the ship as a teaching medical hospital, modernizing the medical equipment will cost between \$2.5 and \$3.0 million.

2.2 SHIP OPERATING COSTS

The costs of operating the ship include labor (seamen, medical personnel and other administrative staff), fuel, ship supplies, spare parts, regular engine and ship maintenance, insurance and port and other maritime fees. Each of these cost elements are discussed below.

1. **Labor Cost:** According to Life International, the ship will sail with a volunteer maritime crew of 40. The ship will be registered under U.S. flag and have a Master, Chief Officer, a second mate and a third mate, a Chief Engineer, a second engineer, a third engineer, a radio operator, Chief Steward, Bos'n mate, Chief Purser, several able-bodied seamen, also engine room wipers and oilers, cooks, laundry personnel, other steward department personnel, etc.

The ship will have about 150 all-volunteer American medical personnel and about 100 local workers. The ship's maritime crew, the ship medical personnel and local workers will be paid \$100 per month each besides free room and board. In addition, Life International plans to pay a monthly stipend to about 100 local trainees. Graduate residents, nurse practitioners, nurse trainees and health educators will receive a stipend of \$75 per month. Local lab technicians, radiology technicians, and other local trainees will receive a stipend of \$50 per month. According to Life International, the estimated salary and stipend cost is about \$460,000 per annum.

2. **Cost of Fuel and Lube Oil:** The cost of fuel for sailing and operating the ship depends upon the type and size of engine, and the type of fuel burnt (diesel fuel, bunker fuel, etc.). Once the ship starts operation, its engines will be run continuously until the ship returns to the U.S. for a regular maintenance. The rule of thumb for consumption of fuel is 1 gallon of fuel per horsepower per day.

While at sea and docked at port the ship will need to generate sufficient electricity for lighting, cooking, laundry, air conditioning, etc. The ship has an emergency generator and a separate generator for powering the hospital equipment including the refrigerators, X-ray machine and the sterilization chambers. According to Life International, the Sanctuary will require 360 barrels of diesel fuel per day while steaming and 75 barrels of diesel fuel per day while in port. Life International estimates fuel cost at \$650,000 per year.

3. **Regular Ship Maintenance Cost:** This cost depends upon the condition of the ship, the engine and the generators. Drydock services are required every two years. The engine and generators will need regular maintenance. The cost of regular ship maintenance costs including labor and material is estimated at \$500,000 per year.

4. **Cost of supplies:** The ship has to carry a stock of food supplies for the crew and the medical staff as well as for patients on board. In addition, it has to carry spare parts, soap, laundry supplies, toiletries, etc. According to Life International's own estimate supply costs per year are as follows:

-	Food and beverage ²	\$950,000
-	Medical and surgical supplies ³	\$3,500,000
-	Non-medical supplies	\$450,000
-	Training and education material	\$60,000
-	Misc. spare parts	\$300,000
-	Local purchases	\$300,000
	Subtotal	\$5,560,000

5. **Other costs:** The ship will require oil pollution insurance; customs bond; and other marine insurance. While in port, the ship may need to pay linesmen, tug boat fees, pilotage, wharfage, moorage, water and trash agent fees, immigration and longshoreman fees. Life International

² Life International expects to carry sufficient food and beverage to feed the ship crew, medical staff, trainees and patients.

³ Life International plans to carry sufficient medical and surgical supplies including hypodermic needles and syringes, drugs, IV fluids, oxygen cylinders, X-ray films, surgical instruments, laboratory supplies, reagents, slides, culture media, medical exam supplies, etc. It expects most of these articles to come from donations.

plans to have mobile teams for in-land operations. While off-shore, the teams may need to rent apartments and other facilities. These miscellaneous costs include:

-	Mobile Clinics and Dispensaries ⁴	\$350,000
-	Rent and Leases	\$50,000
-	Utilities	\$200,000
-	Insurance ⁵	\$150,000
-	Air Fare and other transportation ⁶	\$250,000
	Subtotal	\$1,000,000

In sum, Life International has estimated that it will cost between \$8.0 million and \$8.5 million per year to operate the ship.

Life International plans to have three helicopters on board the Sanctuary for ferrying medical staff and supplies inland and for airlifting patients to the ship's hospital facilities. The operating expense quoted above does not include the cost of operating and maintaining Life's helicopters nor the cost of operating and maintaining the mobile health units. It is thus estimated here that the cost of gasoline, aviation fuel, helicopter and health unit maintenance and insurance will drive up Life International's operating expenses to over \$10 million per year.

3. EXPERIENCES OF OTHER ORGANIZATIONS

Project Hope operated the "USS Hope" as a teaching hospital ship. The USS Hope sailed on and off between 1958 and 1974. The USS Hope was fully equipped with modern medical equipment and facilities. It was a 100-bed teaching hospital, fitted with a modern laboratory, X-ray, surgical facility, dental shop, ear and speech laboratory, eye care, dietary kitchen, and a public health unit. The ship had a workshop that manufactured artificial limbs, braces, prosthesis, etc. It provided health care for patients and instruction for doctors and paramedics.

⁴ It seems that the cost for mobile clinic is understated. According to prices obtained by the BHM consultant, the unit cost of each self-propelled mobile clinic is in the range of \$200,000 to \$300,000 depending on options.

⁵ The insurance amount includes premium for \$5 million hull and machinery insurance, premium for \$5 million personal protection and indemnity, and \$1 million comprehensive general liability policy.

⁶ Life International expects to fly some professors, medical specialists, physicians, educators, nurses, etc. back and forth as required.

The USS Hope did not take terminal patients. It only accepted special cases that were interesting enough for teaching and demonstration purposes. Project Hope worked very closely with the host government's Ministry of Health and local hospitals and clinics.

In 1969, USS Hope participated in the Tunisia flood disaster assistance. The ship's staffs were airlifted to the flood site by military helicopters. The staff provided various types of assistance including vaccinations, water and food inspection and public health training on food handling and sanitation.

According to Messrs. Waller and Kerby of Project Hope, a hospital ship operation is a high-cost, high-risk operation. It has a very high opportunity cost to host countries because it uses expensive commercial docking space while simultaneously the costs of labor, fuel and marine regulations make it uneconomical to the operator. In Project Hope's case, in addition, the costs of operating the hospital ship (i.e., fuel, labor) consumed between 50% and 60% of its donated funds. To maximize the use of donated funds, the organization, thus, decided to give up the hospital ship. More specifically, the USS Hope was retired in 1974 for the following reasons:

1. As the result of the 1973 Organization of Petroleum Exporting Countries (OPEC) oil price increase, the cost of bunker fuel quadrupled, making the operation of the ship uneconomical.
2. During that same period, the Environmental Protection Agency (EPA) passed a regulation requiring that all ships retrofit a sewage treatment plant or a sewage holding tank. The cost of complying with this regulation would have added a significant cost to USS Hope's operation.
3. The ship required US Coast Guard inspection. Then labor cost was upward of \$30 per hour, and the inspection would have cost between \$250,000 and \$500,000.
4. The cost of annual maintenance when the ship returned to the U.S. was very costly. The hull had to be cleaned and painted and the bottom of the ship had to be sand blasted, primed and painted, etc.
5. Project Hope's own analysis had revealed that a land-based operation is much more cost-effective than a hospital ship. The analysis showed that with the same level of resources, Project Hope can provide health care and other services to more people from land-based facilities than it can from the deck of a ship.

6. During the same time period there was a large expressed demand from many land-locked countries for the type of services provided by Project Hope.

These factors together were sufficient to convince management to retire the hospital ship. The decision to retire the hospital ship has proven to be sound. Project Hope is now able to provide health care for far more people and at much lower unit cost as a land-based group than it could have from the deck of a hospital ship.

According to Mr. Mercoglia, the Navy's two 1,000-bed hospital ships sail with a crew of 70 merchant marines and a medical staff of 1,500 each. The daily cost of operating each ship, excluding the cost of the medical personnel and fuel, is about \$40,000 to \$50,000. These expenditures cover maintenance, crew cost and port charges only.

Mercy Ships operates a 522-foot hospital ship, the *M/V Anastasis*, which is equipped with three operating rooms, 25-bed patient ward, X-ray facilities, medical and dental labs and has a 3,000 cubic meter cargo hold and an all-volunteer maritime and medical personnel of 350. The *Anastasis* was built in 1953 in Trieste, Italy and has twin Fiat diesel engines with 8,050 horsepower each. *Anastasis* has a Maltese registry. **Mercy Ships** also operates two other ships, the *Good Samaritan*, and the *Pacific Ruby*.

The *Anastasis*, which is of equivalent size as the *Sanctuary*, offers a broad range of disaster relief services including medical treatment and surgery, medical supplies, building materials, and clothing to areas affected by disaster or where major requirements for assistance are unmet by other sources. **Mercy Ships** complements on-deck services with on-shore services. For example, the *Anastasis*'s six mobile dental clinics provide tooth extraction, tooth fillings and training on oral hygiene, and distribute toothpaste, toothbrush, etc. In addition, the ship provides surgical care including cleft palate and split lips surgery, cataract surgery, removal of tumors and goiters and orthopedic surgery. In association with land-based clinics and in collaboration with other health workers, **Mercy Ships** provides training in basic and community sanitation. The ships crew also engages in other development activities including the construction of houses for the homeless, in agricultural development and the provision of water. To some extent, the ship serves as the operations headquarter and provides accommodation for its personnel.

Mercy Ships plans its itinerary a year and half in advance. Therefore, its response time for disaster assistance depends upon where the ships are docked relative to where the disaster is. For example, after Hurricane Hugo (1989) devastated Jamaica, **Mercy Ships** arrived at the island 60 days after the disaster. And after the Mexican earthquake that destroyed many lives and homes, the *Anastasis* arrived a year later.

In terms of supply logistics, **Mercy Ships** purchases its supplies from Europe and other ports before sailing on to the target country. In addition, as soon as the ship docks at

port, Mercy Ships establishes partnerships with local merchants to supply needed commodity and medical supplies.

Mercy Ships operates with an all-volunteer maritime and medical crew. No one in Mercy Ships receives a salary. Each crew member is responsible for raising his/her own financial support. In fact, each crew member pays a monthly maintenance fee of \$200 to live on the ship. While commercial shipping companies in the U.S. expect to spend between \$350 and \$450 per crew member per day, Mercy Ships can run its ship with a \$10 to \$15 cost per crew member per day including food, fuel, supplies and vessel upkeep. This is partly because the crew pay for themselves and partly because Mercy Ships has been successful in receiving donated supplies and services including the provision of fuel, and the waiver of port, pilot and longshoreman fees and other expenses associated with bringing a ship into port.

According to Chuck Poste, the *Esparanza* operated a floating clinic with three sailors along the Amazon River for seven years. The floating clinic was best suited for serving sparsely populated coastal areas and where the population tended to be nomadic. However, because of cost overruns, *Esparanza* discontinued this operation.

4. OBJECTIVES OF OFDA

OFDA, in the past, has responded to a range of disasters around the world including earthquakes, volcanic eruptions, floods, fires, landslides, mudslides, civil strife, hurricanes, cyclones, typhoons, and famine. OFDA's goals are saving lives and reducing suffering caused by natural and man-made hazards and reducing the economic and social impacts caused by disasters. OFDA's objectives in providing disaster relief are:

1. *Intervene rapidly, in a matter of days after the U.S. Mission Chief (usually the U.S. Ambassador) declares the disaster, to save lives and return victims to a stable condition; and*
2. *Foster development of an indigenous medical capability to maintain an appropriate level of medical services after the crisis.*

OFDA does not provide long-term health care, which is addressed through A.I.D.'s health care development goals. In a disaster situation, OFDA coordinates with A.I.D.'s field missions to assess and address the needs of disaster victims. Once the nature of the disaster is determined and the type of needed assistance to victims is understood, OFDA provides grants and emergency commodities, medicine and medical supplies for disaster

relief.⁷ In the past, OFDA has provided vaccines for immunizing children against measles, polio, diphtheria and tetanus that are the main killers of children in disaster areas. It has provided grants for supplemental feeding, nutritional surveillance, water sanitation and construction of wells for rehabilitation. OFDA also has provided drugs for cattle vaccination for sustainable famine mitigation in sub-Saharan Africa.

OFDA channels its disaster assistance through United Nations agencies, international relief agencies, and through international and local non-governmental (NGOs) and private voluntary organizations (PVOs). In fiscal year 1992, OFDA responded to 65 newly declared disasters and disbursed over \$119 million for disaster relief. Twenty-one of those disasters required \$19 million for emergency medical and sanitation commodities and services. This emergency medical assistance, by country, disaster type, number of people affected, and funding is detailed in Table 1 on page 16.

In addition, OFDA provides disaster preparedness training to government officials, to relief workers, and to local health workers. The OFDA strategy in disaster prevention, mitigation, preparedness (PMP) seeks to stimulate new and innovative approaches for reducing the impact of disaster on potential victims and economic assets in highly disaster-prone countries. OFDA seeks to capitalize on market-like incentives for fostering the adoption of PMP measures.⁸ The PMP program supports the application of proven or promising technologies, approaches or techniques for prevention, mitigation or preparing for known or probably disastrous events.⁹

OFDA has five strategically located commodity stockpiles around the world that it draws down as needed in disaster relief.¹⁰ It also has a rapid response arrangement with selected commodity suppliers. These suppliers are expected to respond within a couple of days. In addition, in consultation and coordination with the local A.I.D. mission, OFDA can arrange for the local purchase of relief commodities very quickly. For the most part, OFDA finds local medical facilities and personnel satisfactory for disaster relief activities and only in a few cases it has airlifted specialists into disaster areas. OFDA is thus able to respond in a matter of hours or within a few days.

⁷ Relief and emergency commodities include construction materials, blankets, water jugs, hard hats, gloves, face masks, tents, cooking utensils, water tanks, tools, and drugs and medical supplies.

⁸ The incentive could take the form of tax breaks or lower insurance premiums for home buyers or developers who use mitigation techniques in constructing new houses and buildings; or the integration of earthquake mitigation building standards into bank loan requirements.

⁹ Famine intervention envisioned for Africa and other regions will include livestock preservation programs, water conservation techniques, and utilization of drought-resistant seeds.

¹⁰ OFDA's five global strategic locations for stockpiling relief and emergency supplies are Panama, Italy, Guam, Singapore, and Maryland, USA.

5. COST-EFFECTIVENESS AND TIMELINESS

Life International intends to convert the USS Sanctuary into a floating hospital to aid Third World countries, docking in one port for 18 to 24 months at a time. According to Life International, the Sanctuary and her crew will provide health education, medical training and care, technical assistance and other humanitarian services from the deck of the ship as well as onshore from mobile health vehicles and other facilities.

In general, the objective of cost-effectiveness analysis is to compare alternative strategies for achieving the same outcome. The method can also be used to decide the best mix of strategies for reaching a target level of outcomes, given a fixed amount of resources.¹¹ According to Life International's own estimate it will cost about \$18 to \$20 million to repair and refurbish the Sanctuary to make it seaworthy. In addition, Life International expects to incur operating expenses of about \$8.5 to \$10 million per year over the first three years of operation.

In fiscal year 1990, OFDA responded to 52 newly declared disasters and disbursed just over \$13 million in medical, sanitation, and water emergency assistance. Of this amount about \$7.2 million was for medical supplies for Panama. The fighting between U.S. troops and General Noriega's forces had created an emergency situation which affected over 10,000 people. In fiscal year 1991, OFDA responded to 62 newly declared disasters and disbursed a little over \$8 million in medical, sanitation, water emergency assistance of which \$2 million was for a northern Somalia water project.

In the most recent fiscal year, 1992, OFDA responded to 65 newly declared disasters and spent over \$19 million on various health and sanitation projects (see Table 2 on page 17). The increase in the number of disasters reflects the changing nature of the disasters. Civil strife and related disasters account for almost a third of the FY 1992 disasters listed in Table 2, with more than two-thirds of the funding.

Funding requested to cover operating expenses by Life International is about \$8.5 million per year, of which \$3.5 million is for medical supplies. Assuming that the nature of the disaster and the level of medical and sanitation assistance provided by OFDA to international PVOs in the future remains the same, which on average is between \$4.0 to

¹¹ For example, for an expanded program on immunization, a highly cost-effective program is one which maximizes the number of immunized children with the fewest resources. Major factors which appear to influence the cost of each alternative strategy include:

- the number and type of personnel providing services;
- the type of immunization technology used;
- the level of immunization activity, as higher activity means a greater use of vaccines and syringes; and
- the cost of critical elements for service delivery such as building or vehicles.

\$6.0 million, the amount of funding requested by Life International to cover its operating costs will consume the total OFDA medical and sanitation-related disaster relief funds. This means that for every dollar of disaster-related medical assistance, Life International will have to spend between \$1.50 and \$ 2.00 for service delivery. This is not a cost-effective method for delivering disaster assistance.

Disasters can occur anytime and anywhere. Disasters, whether natural or man-made, require quick response. OFDA through its relationships with A.I.D. Missions, PVOs, NGOs, and collaborating international organizations can respond to disaster situations within a matter of hours, and often to multiple disaster locations in a given month. As shown in Table 3 on page 18, for natural disasters such as earthquakes, typhoons, cyclones, hurricanes, and floods OFDA disaster response time is between three and five days. The table also suggests that between two to five disasters can occur simultaneously or within short time intervals in different parts of the world. For example, in late November and early December 1991, very different disasters occurred within two weeks of each other -- civil strife in the former Yugoslavia and floods in Western Samoa. Another example is in July 1992, when OFDA responded to the needs of displaced persons in Rwanda, and the next day, to victims of floods and lahars in the Philippines.

Most hospital ships plan their itinerary months, if not years, in advance. Unless a given disaster occurs within the immediate area of the ship's docking location, it can take several weeks for the ship to pull anchor and sail to the disaster location. Because of the time it takes to disengage from prior commitments and the slow speed of a ship, it will be physically impossible for a ship to respond immediately to all kinds of disasters as they occur. In general, ships are the least rapid means for delivering disaster assistance, especially for the types of natural disasters mentioned above. The experience of Mercy Ships attests to this fact. The M/V Anastasis arrived 60 days after Hurricane Hugo had devastated the island of Jamaica.

A hospital ship is most useful for treating victims that cannot be given adequate medical care locally. These victims can be airlifted to the ship and given treatment and their condition stabilized until they are transferred to an appropriate treatment and recovery facility. However, for many developing countries, cultural constraints make a hospital ship the least cost-effective vehicle for treating victims. In many developing countries, tribal cultures require that family members accompany the victim while receiving treatment. This means that, while the victim is being treated and is recovering, his or her family has to be taken care of on the ship. When the costs of airlifting a disaster victim and his or her family, hospitalizing the victim, and maintaining the victim's family are considered, however, airlifting specialists with prepackaged kits to the victim's location would be much more cost-effective and less traumatic to the victim's family. Furthermore, for land-locked countries, a prepackaged mobile arrangement would be more cost-effective for delivering sophisticated treatment than a hospital ship.

Proper delivery of assistance to disaster stricken localities requires intimate knowledge of the geography, infrastructure and the cultural norms of the locality. Staffs of relief agencies are constantly under danger, particularly in war-torn countries such as Somalia, Ethiopia, Sudan, Angola and Mozambique. Setting up the logistics for the delivery of food and medical services to disaster victims can take a long time unless the organization has the expertise and the experience in that locality. It also will need the collaboration and support of the local people and the government. OFDA delivers its disaster assistance through U.S. and international PVOs, the United Nations, and through well established and well known indigenous NGOs. The types of organizations OFDA will normally support are illustrated in Table 4 on pages 19-20. Life International does not have overseas experience nor disaster assistance expertise. It faces a steep learning curve. This means Life International will require more time to get acquainted with the disaster-stricken community in order to lay out and set up the supply and assistance delivery logistics. This undoubtedly will delay OFDA's disaster response and further complicate the situation of disaster victims.

6. CONCLUSIONS

In summary, given OFDA's disaster response objectives and strategies, a hospital ship such as Life International will be the least cost-effective and timely vehicle for delivering disaster-related medical and sanitation assistance. Life International's estimated yearly operating expenses will consume the most of the total OFDA disaster-related medical assistance funds. Moreover, it would take Life International several weeks and months to respond to disaster assistance calls.

The preliminary cost estimates for repairing, refitting, and operating Life International's ship are as follows.

Cost of Repairing and Refitting	\$18 to \$20 million
Cost of Medical Equipment Modernization	\$2.5 to \$3.0 million
Hospital Ship Operating Costs per Year ¹² :	
Labor	\$460,000
Fuel	\$650,000
Regular Maintenance	\$500,000
Supplies	\$5,560,000
Other	<u>\$1,000,000</u>
Subtotal	\$8,170,000 +

It will take, approximately, one and a half to two years to repair and refit the ship.

¹² The cost of maintaining and operating the ship's helicopters and mobile clinical units is an additional cost not reflected above.

Table 1: OFDA Disaster Assistance - FY 1992

Country	Type of Disaster	Number of People Affected	OFDA Disaster Funding	Funding for Medical/Sanitation
Angola	Displaced Persons	1,400,000	\$13,426,787	\$2,374,605
Burundi	Epidemic	2,068	25,000	25,000
Cameroon	Epidemic	500	45,174	45,174
Cen. African Rep.	Epidemic	418	24,984	24,984
Ethiopia	Drought	6,160,000	6,605,994	542,450
Liberia	Civil Strife	1,250,000	7,189,742	2,720,465
Madagascar	Drought	1,000,000	125,000	125,000
Malawi	Drought	5,700,000	2,244,491	357,706
Namibia	Drought	250,000	1,232,765	453,265
Rwanda	Displaced Persons ¹³	350,000	2,206,487	632,729
Sierra Leone	Displaced Persons	-	964,311	536,590
Somalia	Civil Strife	4,500,000	26,126,668	3,147,837
Southern Africa	Drought	-	4,775,093	4,666,255
Sudan	Civil Strife	8,600,000	13,313,409	2,027,845
Zaire	Displaced Persons	25,000	699,100	559,000
Argentina	Floods	100,000	192,054	50,000
Ecuador	Floods	125,000	25,000	25,000
Mexico	Accident	15,000	25,000	25,000
Paraguay	Floods	65,575	170,400	10,000
Kyrgyzstan	Earthquake/Floods	-	25,000	22,781
Kyrgyzstan	Earthquake	130,000	152,715	25,000
Lebanon	Civil Strife	-	299,306	299,306
Pakistan	Floods	9,385,000	435,934	385,934
Tajikistan	Floods	63,500	204,759	78,183
Uzbekistan	Earthquake	50,000	25,000	25,000
Western Samoa	Cyclone	85,000	497,482	15,000
Yugoslavia	Civil Strife	3,122,700	3,760,201	1,390,896 1,154,940 360,578
		42,402,626	80,076,763	19,560,687

¹³ Carryover from disaster declared in 1990.

**Table 2: Office of U.S. Foreign Disaster Assistance - Medical/Sanitation Assistance \1
(Thousands of U.S. Dollars)**

	1989	1990	1991	1992
Medical Supplies \2	740	8,207	2,396	1,946
Medicines	101	199	180	1,078
Medical Projects \3	1165	2,180	5,245	6,877
Medical Personnel \4	121	2,022	70	323
Medical Transport	251	15	0	25
Water Projects \5	920	500	2,468	9,311
Water Experts	0	90	40	342
Sanitation Experts	0	300	0	25
Water Purification Units	0	0	4	0
Total	3,298	13,513	10,399	19,561

1. SOURCE OF DATA: OFDA Commodity/Service Report
2. In 1991, \$3.3 million in medical project was for the Sudan civil strife/displaced persons.
3. In 1990, \$7.2 million in medical supplies was for Panama's emergency relief which affected about 12,000 people.
4. In 1990, \$2.0 million in medical personnel was for the Ethiopian civil war/drought which affected about 4.5 million people.
5. In 1991, \$2.0 million for water projects was for Somalia civil war which affected 2 million people.

Table 3: OFDA's Disaster Response Time - FY 1992

Country	Disaster Type	Disaster Declaration Date ¹⁴	Date OFDA Responded ¹⁵
Angola	Displaced Persons	October 1, 1991	Immediate
Philippines	Floods	November 6, 1991	November 7, 1991
Former Yugoslavia	Civil Strife	November 26, 1991	December 1991
Western Samoa	Floods	December 9, 1991	December 12, 1991
Turkey	Earthquake	March 14, 1992	Immediate
Nicaragua	Volcano	April 11, 1992	Immediate
Mozambique	Accident	April 19, 1992	April 21, 1992
Kenya	Displaced Persons	May 13, 1992	June 1992
Tajikistan	Floods	May 25, 1992	June 1992
Georgia	Emergency	June 11, 1992	June 23, 1992
Rwanda	Displaced Persons	July 21, 1992	Immediate
Philippines	Floods/Lahars	July 22, 1992	August 7, 1992
Nicaragua	Tsunami	September 2, 1992	Immediate

¹⁴ Date the United States Government (USG) Chief of Mission (usually the U.S. Ambassador) declares a disaster.

¹⁵ Date OFDA assistance arrived, in addition to the initial \$25,000 donation on the date the disaster was declared.

Table 4: OFDA's Disaster Response

Country	Disaster Type	Collaborating PVOs, and NGOs	In-Country Experience
Iran	Earthquake	American Red Cross (ARC)	Worked through the Iranian Red Crescent Society, which is an indigenous organization
Jordan	Displaced Persons	Cooperation for American Relief Everywhere (CARE), Save the Children Federation (SCF), United Nations Office of Disaster Relief Coordinator (UNDRO)	CARE and SCF have offices locally. UNDRO works with locally established international and indigenous PVOs and NGOs
Lebanon	Civil Strife	SCF, International Committee of the Red Cross (ICRC), Catholic Relief Service (CRS)	SCF, ICRC and CRS have had a long-term presence in Lebanon
Philippines	Typhoon	Foundation for Educational Evolution and Development (FEED)	Philippine NGO
Sri Lanka	Civil Strife	United Nations Children's Fund (UNICEF)	Has a local office and works with established NGOs and PVOs
Thailand	Typhoon	World Vision Relief and Development (WVRD)	Long-term in-country experience
Algeria	Earthquake	UNDRO, ARC	Work with local NGOs or have long-term in-country experience

Country	Disaster Type	Collaborating PVOs, and NGOs	In-Country Experience
Angola	Drought and Displaced Persons	CRS, Africare, National Council of Negro Women (NCNW), International Rescue Committee (IRC), Adventist Development and Relief Agency (ADRA), ICRC, International Medical Corps (IMC)	Either have long-term local presence or work with local NGOs
Ethiopia	Drought	World Food Program (WFP), Action Internationale Contre La Faim (AICF), Lutheran World Relief (LWR), United Nations Development Program (UNDP), Redda Barna, CRS, Christian Relief Development Agency (CRDA)	Either have long-term local presence or work with local NGOs
Mozambique	Civil Strife	WVRD	Either has long-term local presence or works with local NGOs
Sudan	Civil Strife and Displaced Persons	LWR, WVRD, CARE, UNICEF, UNDP, League of Red Cross and Red Crescent Societies (LRCS), IRC, AICF	Either have long-term local presence or work with local NGOs
Liberia	Civil Strife and Displaced Persons	Special Emergency Life Food (SELF), CRS, Medecins sans Frontieres (MSF)	Either have long-term local presence or work with local NGOs
Romania	Civil Strife	ICRC, WVRD, Project Concern International (PCI), Private Agencies Collaborating Together (PACT)	Either have long-term local presence or work with local NGOs

ANNEXES

**SCOPE OF WORK
FOR
FEASIBILITY STUDY OF HOSPITAL SHIP FOR DISASTER ASSISTANCE**

I. ACTIVITY TO BE EVALUATED

The proposed use by the Agency for International Development (A.I.D.) of a hospital ship to respond to emergencies.

II. PURPOSE OF THE EVALUATION

A. Reason why evaluation is needed

Life International has inquired about possible A.I.D. funding for refurbishing and retrofitting the hospital ship, USS Sanctuary. Moreover, House and Senate Appropriations Committees, in reports accompanying the FY 1992 and FY 1993 foreign assistance appropriations bills, respectively, requested that the A.I.D. study the feasibility and cost-effectiveness of using a hospital ship to respond to emergencies, such as the famine and health needs now facing the Horn of Africa.

B. Key management issues to be addressed

The study should determine if a hospital ship is a cost-effective vehicle for meeting the Office of U.S. Foreign Disaster Assistance (OFDA) response objectives. The study should also identify the type of health services that A.I.D. provides in both disaster and development situations, and the extent to which a hospital ship would meet those needs in a cost-effective manner.

C. Who will use the results of the Evaluation

The primary beneficiaries of the evaluation are OFDA and the U.S. Congress. A.I.D.'s Bureau of Research and Development may also use the findings in relation to health development interventions.

D. How the evaluation findings and recommendations will be used

The findings will be used to determine the cost-effectiveness of a hospital ship for emergency medical care and to respond to the requests from the Congress and from Life International.

III. BACKGROUND

A. History and current implementation status of the project

In February 1990, Life International, a private voluntary organization, paid \$10 for a 520-foot hospital ship built and used by the Navy. The ship, "USS Sanctuary," was

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commissioned on June 20, 1945 and served for less than a year at the end of World War II. The next time the ship saw action was during the Vietnam War, when the ship was refitted as a hospital ship. It was recommissioned on November 15, 1966, and until her mission was completed on April 23, 1971, the hospital ship treated more than 25,000 patients. The ship was again refitted for use as a dependents hospital and commissary/naval exchange retail store for use by U.S. servicemen and families in Greece, but when Greece withdrew from NATO, the mission was canceled and the ship was retired on January 31, 1975.

Life International acquired the Navy Reserve ship to provide health care for patients and instruction for doctors and paramedics in major Third World ports. Since obtaining the ship, Life International has been soliciting for funding to retrofit and operate the refitted ship. Life International has approached A.I.D.'s OFDA, and the U.S. Congress. The House and Senate Appropriations Committees, in report language accompanying the FY 1992 and FY 1993 foreign operations appropriations bills, respectively, have requested that A.I.D. "look into the feasibility of a program such as Life International." The Appropriations Committees state that A.I.D. "should explore innovative ways to respond to emergencies such as the food and health needs in the Horn of Africa," and that "A.I.D. determine whether this would be a cost-effective way to provide this kind of urgently needed assistance to disaster victims."

On March 2, 1993, OFDA convened a meeting of A.I.D. officers, who decided that to make such a determination and to respond to these inquiries from Congressional committees and Life International, a cost-effectiveness study must be done.

IV. STATEMENT OF WORK

A. Overall Scope

The study should assess the seaworthiness of Life International's ship and the cost of maintenance and repair, and it must assess the experiences other organizations have had in using hospital ships and relate it to various A.I.D. requirements.

Specifically, the study should determine if the ship is a cost-effective way of meeting OFDA's response objectives. The appropriateness of using the ship in disaster response given the time it would take to move the ship and the likely timeliness of its arrival should also be assessed.

Other relevant organizations within A.I.D. and within the PVO community should be surveyed for information on the ship itself and for information on past and current hospital ships experiences. (The American Bureau of Shipping can provide a detailed history of the ship, Project Hope can provide information on why they discontinued using their hospital ship, and the U.S. Coast Guard can provide a detailed history of the ship and any information on structural issues.)

B. Specific Questions to be Addressed by the Evaluation

Overall questions on hospital ships:

- Will using a hospital ship be a cost-effective use of funds for disaster relief, given the amount of direct medical aid dispatched by OFDA during a disaster.
- What are the logistical and financial requirements to operate an hospital ship effectively? Are there any specific requirements (i.e., licenses or permits) that must be met for a hospital ship to operate overseas, or for medical personnel to operate overseas or in developing countries?
- What are the personnel requirements to operate this hospital ship?
- What are the factors that determine whether or not people will use a hospital? Are there cultural reasons that will influence people to use a hospital ship?
- What is the experience of other organizations, like Project Hope, in using hospital ships for disaster relief or development?
- For what specific reasons did Project Hope discontinue using a hospital ship?
- What type of health care services can a hospital ship provide? Does OFDA require those types of services during disasters?
- Would a hospital ship meet the requirements for development initiatives in health care?

Specific questions regarding the retro-fitting of the ship "USS Sanctuary" for Life International:

- How seaworthy is the ship?
- What are the different estimates for making the ship seaworthy?
- What are the estimates for modernizing the medical equipment?
- How much would it cost to operate the ship?
- What will it cost to maintain the ship, particularly when on call far from port?
- How long will it take to refit the ship?

V. METHODS AND PROCEDURES**A. Data Collection and Analysis Methods**

The consultant should address the issues detailed above and incorporate the data on health interventions for development activities, to be provided by the Research and Development Bureau of A.I.D. Other sources that the consultant should use is the American Bureau of Shipping, Project Hope, the U.S. Coast Guard, and the U.S. Navy.

B. Timeframe

Consultant should use 10 days.

C. Procedural Matters

Consultant should incorporate the different types of data available from the different sources, either interviews or document reviews, to present a recommendation on whether a hospital ship is cost-effective for A.I.D.

ANNEX B: List of Institutions and Individuals Contacted

Institution Contacted	Primary Contact Person	Telephone Number
Mercy Ship	John Copley	903 882-0887
Park West Children's Fund, Inc	Sondra Tipton	310 830-4433
Feed The Hungry	Ken Gill	219 291-3292
Project Hope	Jeff Waller Tom Kerby	1-800-544-4673
Esparanza, Phoenix, AZ	Charles Poste	602 252-7772
A.I.D./R&D Health Care	Bob Emrey	703 875-4525
A.I.D./CDI/Health Information	Roy Miller	703 524-5225
A.I.D./Population/Family Planning	Irene Koek	703 875-4667
Naval Sea Command	Edward Karleson	202 366-5841
The Maritime Administration - Division of the Reserve Fleet	George Clark	202 366-5752
A.I.D./Office of U.S. Foreign Disaster Assistance	Jack Slusser	202 647-7545
A.I.D. Medical Commodity Procurement Office	Tony Langeston	703 875-1113
Military Sea Lift Command	Keri Allen J. Mercoglia	202 433-0102
The Navy Bureau of Medicine	Lt. Com. Forsha	703 697-1449
The Coast Guard	Capt. J. Lindak Cdr. John Holmes	202 267-2978 202 267-1464
ABS Americas	Richard W. Norris Thomas J. Ingram Clive Owen, Surveyor	703 892-2493
Life International	Dr. James Johnson James Garnett, Jr Vincent David	301 589-5343

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ANNEX C: Literature Consulted

Life International's Correspondences:

Letter to Chairman Paul Amos, American Family Life Assurance Corporation, May 6, 1992

Letter to the Honorable Sam Nunn, US Senate, July 7, 1992

Letter to The Maritime Administration, Department of Transportation, Attn: Jesse Fernanders, August 14, 1989

Letter to The Honorable Sean O'Keefe, Acting Secretary of the Navy, August 3, 1992

Letter from Andrew S. Natsios, Director, Office of U. S. Foreign Disaster Assistance, October 8, 1991

Letter from Carlos E. Agnese, Norfolk Shipbuilding & Drydock Corporation, July 31, 1992

Letter from Al Lowe, COLONNA'S SHIPYARD, August 3, 1992

Newspaper Articles:

The National Defense Authorization Act for Fiscal Year 1993

Owners hope USS Sanctuary will offer comfort. *The Evening Sun*, November 13, 1990

WW II Cargo Carrier Gets a New Life. *The Washington Post*, September 8, 1990

Hospital Ship will get a new lease on life. *The Boston Globe*, April 11, 1990

Mercy ship aids 3rd World. *Maryland Gazette*, March 7, 1990

Out of Mothballs: Former Navy hospital ship to serve the Third World, *The Washington Times*, September 6, 1990

New life for an Old Veteran. *Navy Medicine*, November - December, 1990

Brochures:

Life International, Caribbean Project: Bringing Life to a world in need. Life International

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Medical Care and Health Training For The Developing World, Hospital Ship Project. Life International

Ship To Serve The World, Mercy Ships

Partners in Health, Partners in HOPE, an overview of Project HOPE International Activities, Project Hope

Annual Reports:

OFDA Annual Report FY 1990

OFDA Annual Report FY 1991

Child Survival, 1989, A Fourth Report to Congress on the USAID Program, U.S. Agency for International Development

Child Survival, 1992, A Seventh Report to Congress on the USAID Program, U. S. Agency for International Development

Other:

Louis W. Sullivan, MD and Ronald W. Roskens, PhD, A Report To The President, Child Survival and AIDS in Sub-Saharan Africa, January, 1991

Brenzel, Logan, The Cost of EPI, Resources for Child Health Project (REACH) publication, September 1990

ANNEX D**American Bureau of Shipping**

REPORT NUMBER BA8740

Baltimore, Maryland, 7 May 1993

S.S. "SANCTUARY"

THIS IS TO CERTIFY that the undersigned Surveyor did, at the request of Basic Health Management, Inc. attend the vessel "SANCTUARY" on the 7th day of May 1993 as the vessel lay afloat at Baltimore, Maryland for the purpose of conducting a Conditional Survey. For further particulars see report as follow

GENERAL NOTES:

- 1) At time of survey, the vessel was in a permanent laid up condition. No tanks were certified safe for entry, and no machinery and/or equipment could be operationally tested. No drawings were available at time of survey, however, the Owners stated that a full set of drawings were on file in their office.
- 2) The vessel since it was placed in the Ready Reserve Fleet had been under a controlled dehumidification system. However, the present vessel's Owners advised that the system had broken down in early 1993 and has not as of this date been reactivated.

HISTORY

The vessel was originally to be built as a C-4 cargo Vessel "MARINE OWL" to American Bureau of Shipping Classification and was built under ABS Supervision until the time the vessel was taken over by the U.S. Navy for the conversion to a hospital ship. The "MARINE OWL" was never classed by ABS, however, her sister ship "VALL MOON" ex. "MARINE RAVEN" was classed with this Bureau until it was scrapped in 1976. The vessel was completed by Sun Shipbuilding and Dry Dock Company, Chester, Pennsylvania as a Naval Hospital Ship in 1944. In 1970 a major overhaul of the vessel was done at Avondale Shipyard, New Orleans, Louisiana. In 1976 thru August 1978, the vessel was prepared for permanent lay up in the Marad James River Reserve Fleet. The vessel remained at the Reserve Fleet until the present Owners moved the vessel to Baltimore, Maryland.

VESSEL'S PARTICULARS

Built at - Sun Shipbuilding & Dry Dock Company
 Hull No. - 353
 Registered Breadth - 71.6'
 Registered Depth - 25.6'
 Registered Length Overall - 520
 Horsepower - 9,000 SHP
 Gross Tonnage - 13,574
 (CONTINUED ON PAGE 2)

NOTE: This Report evidences that the survey reported herein was carried out in compliance with one or more of the Rules, guides, standards or other criteria of American Bureau of Shipping and is issued solely for the use of the Bureau, its committees, its clients or other authorized entities. This Report is a representation only that the vessel, structure, item of material, equipment, machinery or any other item covered by this Report has been examined for compliance with, or has met one or more of the Rules, guides, standards or other criteria of American Bureau of Shipping. The validity, applicability and interpretation of this Report is governed by the Rules and standards of American Bureau of Shipping who shall remain the sole judge thereof. Nothing contained in this Report or in any notation made in contemplation of this Report shall be deemed to relieve any designer, builder, owner, manufacturer, seller, supplier, repairer, operator or other entity of any warranty express or implied.

American Bureau of Shipping

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S.S. "SANCTUARY"

VESSEL'S PARTICULARS (Continued)

Displacement @ 24'-05" - 15,700
 Estimated Evaporator Capacity (as advised by Owners) - 230 tons/day
 Estimated Fuel Oil daily consumption (as advised by Owners) -
 (Steaming) - 360 barrels
 (In Port) - 75 barrels

320 Bed Hospital Vessel/Commissary/Store and Ships Exchange Vessel (USNS Vesse:

HULL

1) The vessel has not been drydocked since 1977/1978.

2) General condition of exterior of hull plating from waterline up, coating has failed and large areas of rust were found.

- a) Bolted pipe fenders running vertical on the hull, where they have broken away, showed heavy rusting of the hull.
- b) No riveted strakes were noted. However, a strength strap fitted on upper strake was huck bolted and appears in good condition.
- c) Upper portion of rudder and stock appears heavily rusted, no coating.
- d) The hull area below the waterline all of the coating appeared to have failed and rusting and small pitting could be seen for approximately one foot (1') below the water.
- e) The propeller was not visible at this time.

3) General condition of interior of hull plating appears good with little rusting noted. all of the interior of the hull both in the superstructure and the main structural areas examined were either coated or insulated with asbestos.

- a) The expansion joints inway of the superstructure appears frozen and inoperable.
- b) No. 1 forward cargo hold was in good condition, well coated and no deterioration noted.
- c) The following tanks were found opened but because no safe for entry permit was found only a general examination of the tanks were made from the first platform. All of the internal structure was found to be coated and generally the coating was found to be adhering and no deterioration of the structure noted:
 - I) Forepeak
 - II) Afterpeak
 - III) SWD Deep Tank P/S (3-20-1)
- d) Forepeak space and aft peak spaces found well coated and preserved.
- e) Chain locker and chains generally examined with chain in lockers and all found well coated and preserved.

(CONTINUED ON PAGE 3)

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S.S. "SANCTUARY"

- 4) All exposed and covered decks appear to be in good condition. Exterior decks inway of superstructure were protected with a wood covering which generally appears intact. Exterior decks, fore and aft of superstructure were well coated and only spots of rust showing.
- 5) Closing devices such as hatch covers, watertight doors, including side port doors were generally found in good structural condition.
- 6) The general condition of the engine room structurally was found to be in good condition. Foundations, tank tops and side shell all found coated and no rusting or wastage noted. Some minor rusting noted under the main condenser tank top.
- 7) The general condition of the auxiliary engine room structure was found to be in good condition.

NOTE:1) No determination can be made at this time as to actual thicknesses of the hull structure due to the fact that no gaugings were taken and nor were any drawings to indicate same available.

2) Due to age of vessel and date of last shipyard the vessel's coating system may contain lead paint.

MACHINERY

- 8) The main and auxiliary propulsion machinery was found to have been laid up in dry condition and appeared in good condition as far as could be seen.
 - a) Upper drums on the boilers were opened and examined and appeared satisfactory.
 - b) One inspection plate on the reduction gear was lifted and gears appeared in satisfactory condition.
 - c) The shaft lock was noted to be installed which would indicate that the propulsion system has not been rotated possibly since 1978.
 - d) The Owners advised that some machinery had been opened out in 1992 and records of this were available but were not reviewed at this time.
 - e) Steering gear appeared to be well preserved.
 - f) Anchor windlass appeared to be well preserved. The mooring equipment was not examined at this time.
 - g) All condensers, main and auxiliary, were opened and examined and as far as could be seen appeared in good condition.
 - h) All piping appeared to be in good condition as seen in areas where the piping had been disconnected. All piping throughout the vessel was covered in asbestos.
 - i) Ventilation ducting throughout the vessel was opened, examined and appeared in good condition. All ventilation ducting is covered externally and some internally with asbestos.

(CONTINUED ON PAGE 4)

American Bureau of Shipping

REPORT NO BA8740

- 4 -

DATE 7 May 1993

S.S. "SANCTUARY"

ELECTRICAL

- 9) The vessel's electrical systems are DC for the main ship's machinery and AC for the hospital areas.
- a) The DC system appears to have been possibly built to ABS/USCG Rules, however, the AC system is to Navy Rules, therefore, probably will not conform to ABS/USCG Rules.
- b) No testing was done to the electrical system, only visual examination of the condition of the switchboard and motors were made, and as far as could be seen, appear to be dry and operational.

LOAD LINE

- 10) The vessel has never had a Load Line assignment. If the vessel is required to have a Load Line, as a passenger ship/hospital ship, intact stability and sub division will be a large concern.

SOLAS

- 11) Firefighting regulation for passenger ship/hospital ship are not complied with by this vessel.
- 12) Lifesaving equipment regulation for passenger ship/hospital ship are not complied with by this vessel.

NAVIGATIONAL/RADIO EQUIPMENT

- 13) All of the above equipment is outdated and will have to be renewed.

HOSPITAL EQUIPMENT

14. All of the equipment appears to be outdated, however, the Owners advised that all of the equipment is operational and can be serviced by the Manufacturer.

This report is issued without prejudice.


I. J. C. OWEN

Attending:
Dr. James E. Johnson - Life International
Vincent David - Life International
James Garneti, Jr. - Life International
Sam Taddesse - Basic Health Management
Suzanne Burgess - Basic Health Management

12 May 1993

Refer to: RWN/s
File Ref: 93-W-459
S-1

Basic Health Management, Inc.
8403 Colesville Road, Suite 805
Silver Spring, MD 20910

Attn: Suzanne Burgess (OFDA)

Subj: "SANCTUARY" Existing Vessel Proposed for Class
Sun Shipbuilding & Drydock Hull 353

Dear Ms. Burgess:

In addition to the Condition Survey which has been conducted by our Baltimore Office, we have investigated our records with an eye to bringing the "SANCTUARY" into ABS Class.

We note that the vessel was originally designed and started construction to Class and that a sister vessel "VALL MOON" ABS ID 4411021 is Classed.

We are prepared to consider the "SANCTUARY" for classification "+A1[Ⓢ] + AMS" provided all drawings regarding conversions/modifications to the hull structure and machinery systems are reviewed and found acceptable by our ABS Houston Technical Office.

The following is to be dealt with to the satisfaction of our attending ABS Exclusive Surveyor:

- a) Full Special Survey of Hull and Machinery equivalent to Special Survey #10, including hull gaugings to extent required by our rules for Special Survey #10. The attending Surveyor should verify that vessel was built in accordance with requested plans.
- b) Drydocking Survey
- c) Tailshaft Survey
- d) Annual Survey of Hull and Machinery
- e) Repairs of any damages and/or wastages which would affect class or service of the vessel.

In order for this Bureau to issue a full term loadline certificate in addition to loading manual or equivalent, three (3) copies of the trim and stability booklet are to be submitted for review to U.S. Coast Guard, and all conditions of assignment including damage stability are to be complied with. Our attending Surveyor is to complete form LL 11-D and forward same with copy of present Load Line certificate with his reports.

To avoid complications, the above surveys should not be commenced until all requested plans are submitted for review.

Upon satisfactory completion of plan review, above requirements and surveys, and if attending surveyor considers gaugings acceptable, he may issue an interim class certificate and provisional loadline certificate (repeating the present marks) both valid for five (5) months pending submittal and approval of stability information by ABS.

We understand that the vessel is to comply with USCG regulations for passenger vessels (subchapter H). If the vessel is required by flag administration to also comply with SOLAS, then plans and data for statutory certification of existing passenger vessels (see attached) are to be submitted for review/approval to ABS Ft. Lauderdale, Attention: Mr. Charles Dorchak. Any assistance or questions regarding this matter should be directed to Mr. Dorchak.

The attending Surveyor is to complete and forward form AB 252 (Parts Listing) with his reports.

Since the vessel is U.S. Flag, the owners must contact and make application for inspection to the Coast Guard (Commandant G-MVI) Washington, D.C. A meeting with the Coast Guard would be necessary to establish procedures for their plan review inspection and equivalency determinations.

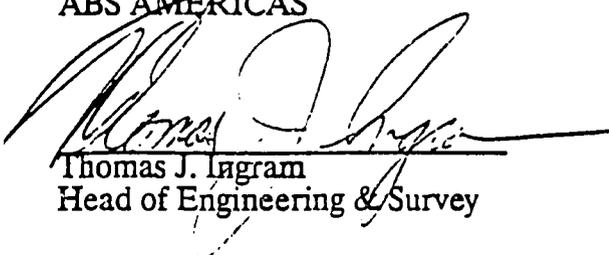
We have enclosed our Request for Class form and application for load line as per present procedure. These should be submitted when you intend to start the classification process.

The vessel will be described in column five (5) of our Record as a "Hospital vessel".

If we may be of further assistance or additional information required, please contact the undersigned or Richard Norris at (703) 892-2493.

Very truly yours,

ABS AMERICAS



Thomas J. Ingram
Head of Engineering & Survey

CC: Mr. Same Taddesse
903 Farley Court
Vienna, VA 22180

ABS Houston/Attn: Mr. Abschneider/Mr. Ashe
ABS Baltimore/Attn: Mr. Owens
ABS Ft. Lauderdale/Attn: Mr. Dorchak

PLANS AND DATA REQUIRED FOR STATUTORY COMPLIANCE WITH SOLAS
1974 (AS AMENDED) PASSENGER SHIP SAFETY CERTIFICATE (SLP)

The information listed below shall be submitted in triplicate to the Headquarters Office for review and approval (prior to any recommendation by the Bureau to the Government of the vessel's Registry), regarding issuance of SOLAS Certificates. In describing the material listed, all references relate to Chapter, Part, and Regulation of the 1974 (consolidated text of) Safety of Life at Sea Convention (as amended) unless otherwise noted.

A. Subdivision and Damage Stability Chapter II-1, Parts A and B

1. Floodable length calculations and curves, based on the deepest subdivision load line.
2. Damage stability calculations. In addition to establishing the critical compartments, they should also include the required metacentric height (GM) curve, covering the range of operating drafts.
3. A preliminary trim and stability booklet, using the estimated lightship weights and centers of gravity. For the contents of this booklet see IACS LL Interpretation 45 as accepted by IMO. Subsequent to the inclining experiment, the booklet shall be revised to reflect the results of the experiment, along with any remarks we may have on the preliminary one, correcting it as necessary, and submitting in triplicate.
4. A damage control plan for the guidance of the officer in charge of the vessel, showing clearly for each deck and hold, in profile and plan views, the boundaries of the watertight compartments, the openings and pipe penetrations, all cross flooding arrangements therein with the means of closure and position of any control thereof, and the arrangements for the correction of any list due to flooding.

The above mentioned damage control plan can also, if so desired, be incorporated in the trim and stability booklet.
5. A copy of the inclining experiment data. The inclining experiment should be duly performed, after the vessel is as complete as practicable, in accordance with our Circular 179, Index 5.3.1, Revised 11 January 1983.
6. Details of watertight doors, including class, operating gear, control, alarms and indicators.
7. Details of all penetrations and openings in watertight transverse or longitudinal bulkheads, decks and shell platings; all vents, overflows, air pipes and their exposed heights above deck.
8. Lines and body plan, hydrostatic curves, capacity plan, bonjean curves, cross curves of stability.
9. Arrangement plans for the bilge and ballast piping, sanitary piping and other similar systems, so that we may ascertain that damage to the piping system located less than 20% of the beam, from the sides of the vessel, will not flood other intact empty spaces.

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B. Structural Fire Protection, Chapter II-2, Parts A & B (as applicable)

1. Ship's construction; with/without Sprinkler System; or Method I, II, or III (if existing vessel from 1960 Solas).
2. Fire construction plans consisting of general arrangement plans for each deck and an inboard profile clearly showing the main vertical zones, Class "A", "B", "C" and other divisions, the locating of each type of structural fire insulation, stairway and elevator enclosures, control space and enclosures and type of doors in watertight and fire bulkheads.
3. Typical details of structural fire insulation used on bulkheads and decks including type, rating, thickness, manufacturer, special instructions for installations, means of application, and test certificate of manufacturer or other testing facility, and Administration approvals. The type of insulation shall be keyed by reference to the fire control plan (Regulation 20).
4. Typical details plan showing the extent and locations of various types of material and joiner construction, including draft stops.
5. Detail plans and test certificates on fire doors including manufacturer, type, rating, insulation, means of closure. Additionally, these are to be keyed by reference to the fire control plan required by Regulation 20.
6. Detailed plan of ventilation systems, indicating all piercing of bulkheads and decks including details of fire dampers and controls to system.

C. Fire Control Plan, Chapter II-2, Part A, Regulation 20

A detail plan as stated in Regulation 20 for posting on vessel including the following:

1. Sprinkler systems, pumps, lines, heads, alarms and controls.
2. Fire detection system, spaces covered, type, alarms and indicators.
3. Fire patrol check points.
4. Fire hydrants, hoses, nozzles, pump locations.
5. Fire extinguishing systems; hand portable, fixed, semi-fixed types and spaces covered.
6. Firemen's outfits, gear and locations.
7. International shore connection.
8. General alarm locations, P.A. speakers.
9. Emergency shut-offs (remote) for machinery, fuel and ventilation systems.
10. Control stations.
11. Fire sections enclosed by A and B class divisions.

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12. Means of escape and access to various decks and compartments.
13. Particulars on fan control positions, dampers and identification numbers of ventilating fans serving each section.

D. Lifesaving Appliances, Chapter III

1. Evacuation plan showing routes of escape from all passenger and crew spaces with totals on successive stair tower levels to the lifeboat embarkation positions.
2. Lifeboats, type, dimensions, cube, capacities, stowage arrangements, associated equipment, davits, winches, overboard discharges in way of launch positions, with Administration approvals.
3. Rafts, number, type, capacity, stowage arrangements and handling equipment, with Administration approvals.
4. Embarkation ladders for lifeboats and rafts, lighting, lifebuoys.
5. Lifejackets, type, locations, number required as per Regulations 7 and 21.
6. Safety appliance plan showing locations of above items and in addition, line throwing apparatus, signals, portable radios, distress signals, etc.
7. Advise maximum number of passengers and crew, berthed each cabin and by total number of persons allowed on board.

E. Fire Fighting, Machinery, Electrical Equipment and Associated Gear

1. Fire Fighting - Chapters II-2, Part A and B

- a. Details and arrangements of fire main systems, including pumps, piping systems and fire stations.
- b. Details and arrangements of fixed fire extinguishing systems in machinery space and cargo spaces, including location of piping, outlets, activating devices and storage of the fire extinguishing medium. Calculations indicating the quantity of extinguishing medium required and information giving actual quantity provided.
- c. Fire Control Plans - Refer to paragraph C above.
- d. Details and arrangements of fixed fire detection and fire alarm systems.
- e. Details and arrangement of sprinkler system showing tank, pumps, piping, sprinklers, etc.
- f. Arrangements for fuel oil and lubricating oil and other flammable oils including details of location of oil tanks, means of sounding, location of air pipes, overflows and valves, routing of oil fuel piping, means of screening. Where heating arrangements of oil tanks etc. is provided details with regard to type of heating system. Arrangement for high temperature alarms.

- g. Arrangements for the carriage of dangerous goods, if applicable, see Chapter II-2, Part B, Regulation 41 and Part C, Regulation 54.
- h. Special Arrangements in Machinery Spaces, Chapter II-2, Part A, Regulation 11.

Details and arrangements for stopping ventilating fans, forced and induced draught fans, oil fuel pumps and for closing ventilation openings, doors, skylights, etc.

- 2. Bilge and Ballast Systems - Chapter II-1, Part B
Details and arrangements of the bilge and ballast systems showing sizes and location of pump, piping and valves.
- 3. Sanitary Systems
Diagrammatic plan indicating penetrations of watertight bulkheads.
- 4. Inlet and Discharges-Chapter II-1, Part B, Regulation 17
Details and arrangements of sea inlets and discharges showing location and materials of valves and fittings.
- 5. Details and arrangements of main and auxiliary machinery, including control and alarm systems, safety devices, and emergency systems - Chapter II-1, Part C, Regulations 26, 27, 28, and 29.
- 6. Details and arrangements of steering gear - Chapter II-1, Part C, Regulation 29.
- 7. Machinery Controls - Chapter II-1, Part C, Regulation 31
Details and arrangements of remote control for main and auxiliary machinery.
- 8. Steam Boilers and Boiler Feed Systems - Chapter II-1, Part C, Regulation 32
Arrangements for safety valves, controls and alarms.
- 9. Steam Pipe Systems - Chapter II-1, Part C, Regulation 33
Details of all steam piping systems indicating their suitability for the service intended.
- 10. Air Pressure Systems, Chapter II-1, Part C, Regulation 34
Details and arrangements of compressed air systems, including pressure-relief arrangements.
- 11. Ventilation Systems in Machinery Spaces - Chapter II-1, Part C, Regulation 35
Details and arrangements of ventilating systems indicating adequacy of supply for safety and comfort of personnel and operation of machinery in all weather conditions.

12. Protection Against Noise - Chapter II-1, Part C, Regulation 36
- Information indicating measures taken to reduce machinery noise to acceptable levels and/or protection provided for personnel. (Ref. IMO Resolution A.468 (XII)).
13. Communication between Navigating Bridge and Machinery - Chapter II-1, Part C, Regulation 37
- Details of two independent means of communication.
14. Engineer's Alarm - Chapter II-1, Part C, Regulation 38
- Details of engineer's alarm system between engine control room and engineer's accommodation.
15. Electrical Installations
- a. Electric cable penetration through watertight bulkheads - Chapter II-1, Part B, Regulation 15.2.1.
 - b. General Electrical Services, Chapter II-1, Part D, Regulation 40.
 - c. Details and arrangements of the main source of electrical power and of the main distribution system. Chapter II-1, Part D, Regulation 41.
 - d. Details and arrangements of the emergency source of electrical power and of the emergency distribution system. Chapter II-1, Part D, Regulation 42.
 - e. Electrical details and arrangements of the electric and electrohydraulic steering gear unit, indicating the two required sources of power, indicators, alarm and short circuit protection. Chapter II-1, Part C, Regulation 30.
 - f. Starting arrangements for emergency generating sets. Chapter II-1, Part D, Regulation 44.
 - g. Precautions against shock, fire and other hazards of electrical origin. Chapter II-1, D, Regulation 45.
 - h. Periodically Unattended Machinery Spaces. Chapter II-1, Part E, Regulation 54.
 - i. Details and arrangements of the electrical supply and control for all power ventilation. Chapter II-2, Part A, Regulation 32.
 - j. Details and arrangements for electrical power sources and indicators for watertight doors. Chapter II-1, Regulation 15.9.2, Regulation 42.2.6.1.
 - k. Details and arrangements of automatic sprinkler systems indicating the two required sources of power for the seawater pumps, air compressors and alarm systems. Chapter II-2, Part A, Regulation 12.7.1.

The above drawings requested should be submitted at the earliest time by the shipyard for review. The shipyard/Owner should also be advised that where requested, details and certificates are to be considered of extreme importance.

In addition to the above, the forwarding letter should state the deepest subdivision loadline and the number of passengers and crew for which the vessel is to be certified.

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AMERICAN BUREAU OF SHIPPING

45 EISENHOWER DRIVE

PARAMUS, NJ 07652

REQUEST FOR CLASSIFICATION UNDER ABS QUALITY ASSURANCE PROGRAM

1. SERVICES TO BE PERFORMED BY AMERICAN BUREAU OF SHIPPING ("ABS") UNDER THIS REQUEST FOR CERTIFICATION AND AGREEMENT INCLUDE

- a. Analysis by ABS of plans of the vessels to be built in order to verify their meeting the standards as set by ABS Rules.
- b. Access to an extensive computer facility at ABS Headquarters Office for the collation of data on both hull and machinery for the analysis of information on design and operation.
- c. Review and action by ABS Classification Committee and, if the vessels are found to be in accordance with ABS Rules, issuance of certificates of classification.
- d. Miscellaneous services as indicated elsewhere herein.

2. FEES

- a. All fees and payment schedules shall be determined in accordance with normal ABS practices and quoted to the Client in a separate letter.
- b. The fees quoted include the review of the classification drawings and calculations which are required to be submitted by the Rules. An additional fee may be charged for resubmittal of drawings or for a review of plans in addition to those required by the Rules.
- c. All fees are to be remitted in U.S. dollars to American Bureau of Shipping, P.O. Box 23038, Newark, New Jersey 07189 U.S.A. in cash or check. Wire transfers may be made through United Jersey Bank, 210 Main Street, Hackensack, New Jersey 07601 U.S.A., account number 101-141408.
- d. Unless otherwise provided by agreement or prohibited or restricted by law, interest will be charged at a rate of 1 1/2% per month on any amounts not paid within 30 days from invoice date.
- e. Should ABS be required to take any action for the collection of fees hereunder, there shall be added to the invoice amount all costs and expenses of such action, including reasonable attorney's fees, and ABS may take judgment for the entire amount due.

3. SCHEDULED COMPLETION

Any fixed or lump sum fee quotations are based on a definite scheduled completion date fixed at the time of entering into this Agreement. Should this Agreement be extended beyond the anticipated completion date, additional charges (subject to reasonable increases) in accordance with the then current fees, costs and expenses shall be assessed and paid.

4. FORCE MAJEURE

Upon prompt notification of the other party by telegram or letter communication, neither party hereto shall be liable to the other for default or delay in performing its obligations hereunder if such default or delay is caused by fire, strike, riot, war, act of God, delay of carriers, governmental order or regulations and/or any other similar or different occurrence beyond the reasonable control of the party so defaulting or delaying, except that cancellation for such causes may not be made without reimbursement to ABS for expenditures actually incurred for labor and materials upon the authority of this Agreement prior to the filing of such telegram for transmittal, or deposit in the mails of a letter giving such notice.

5. ASSIGNMENT & DELIVERY

Upon cancellation of the underlying contract for the Certification of the Plant covered by this Agreement, all fees for those services already rendered by ABS in accordance with this Agreement shall become immediately due and payable. Upon delivery of the vessel and acceptance by the new owner, any outstanding fees shall be payable by the new owner.

If Customer shall breach any provision hereof or shall become insolvent, enter voluntary or involuntary bankruptcy or receivership proceedings, or make an assignment for the benefit of creditors, ABS shall have the right (without limiting any other rights or remedies which it may have hereunder or by operation of law) to terminate this contract, whereupon ABS shall be relieved of all further obligation hereunder and Customer shall be liable to ABS for all costs incurred by ABS in completing or procuring the completion of the work and all resulting damages. ABS' right to require strict performance of any obligation hereunder shall not be affected by any previous waiver, forbearance or course of dealing.

Any assignment hereof shall not affect the validity of this Agreement.

6. NON-WAIVER

No waiver by either party of any breach of any of the terms of this Agreement shall be construed as a waiver of any subsequent breach, whether of the same or of any other term hereof.

7. CONFIDENTIALITY

Subject to paragraphs 5 and 8 hereof, all plans, drawings, specifications and information given to and reports prepared by ABS in connection with performance under this Agreement shall be treated as confidential by ABS and shall not be used for any other purposes than those for which furnished without prior written consent.

8. DEFAULT

In the event of a default in the payment of any fees assessed in accordance with this agreement, ABS shall have the right to terminate this Agreement and all plans, drawings, specifications, information and reports in possession of ABS shall be subject to a lien for the payment of all fees and expenses due and owing by virtue of this Agreement and the termination or default hereof.

9. ACCESS

ABS, its officers, employees, servants, agents or subcontractors shall have access to all drawings, plans, places of manufacture and assembly or other items necessary to complete the Agreement services.

10. INDEPENDENT CONTRACTOR

In performance of this Agreement, ABS shall be and remain, at all times, an independent contractor and neither ABS nor any of its officers, employees, servants, agents or subcontractors shall be or act as the employee, servant or agent of any other party hereto in its performance of any of the terms and conditions of this Agreement.

11. CLASSIFICATION

The Classification process consists of: a) the development of Rules, Guides, standards and other criteria for the design and construction of marine vessels and structures, for materials, equipment and machinery; b) the review of design and survey during and after construction, to verify compliance with such Rules, Guides, standards or other criteria; and c) the assignment and registration of class when such compliance has been verified.

The Rules and standards are developed by ABS staff and passed upon by committees made up of naval architects, marine engineers, shipbuilders, engine builders, steel makers and by other technical, operating and scientific personnel associated with the worldwide maritime industry. Theoretical research and development, established engineering disciplines, as well as satisfactory service experience are utilized in their development and promulgation. ABS and its committees can act only upon such theoretical and practical considerations in developing Rules and standards and in no way should classification, issuance of certificates or performance of services be deemed to be a representation, statement or warranty of seaworthiness, structural integrity, quality or fitness for a particular use or service, of any vessel, structure, item of material, equipment or machinery beyond the representations contained in the Rules of ABS.

It is understood and agreed that the issuance of classification certificates or the performance of services shall be at the sole discretion of ABS and that ABS reserves the right to withhold classification, certificates or services for lack of conformity with its Rules or for any other reason, whether or not such reason be deemed by the other party to be frivolous, arbitrary or capricious.

12. RESPONSIBILITY AND LIABILITY

It is understood and agreed that any report, statement, notation of plan review or certificate (hereinafter referred to collectively as "certificate") issued as part of the services rendered under this Agreement is a representation only that the vessel, structure, item of material, equipment or machinery or any other item covered by a certificate has met one or more of the Rules or standards of American Bureau of Shipping and is issued solely for the use of ABS, its committees, clients or other authorized entities. The validity, applicability and interpretation of a certificate issued under the terms of or in contemplation of this Agreement is governed by the Rules and standards of American Bureau of Shipping who shall remain the sole judge thereof. Nothing contained herein or in such a certificate or in any report issued in contemplation of such a certificate shall be deemed to relieve any designer, builder, owner, manufacturer, seller, supplier, repairer, operator or other entity of any warranty express or implied nor to create any interest, right, claim or benefit in any third party. It is understood and agreed that nothing expressed herein is intended or shall be construed to give any person, firm or corporation, other than the parties hereto, any right, remedy or claim hereunder or under any provisions herein contained; all provisions hereof are for the sole and exclusive benefit of the parties hereto.

13. LIMITATION

ABS MAKES NO REPRESENTATIONS BEYOND THOSE CONTAINED IN ARTICLES 11 AND 12 HEREOF REGARDING ITS REPORTS, STATEMENTS, PLAN REVIEW, SURVEYS, CERTIFICATES OR OTHER SERVICES.

14. HOLD HARMLESS

The party requesting classification hereunder, or his assignee or successor in interest, agrees to indemnify and hold harmless ABS from and against any and all claims, demands, lawsuits or actions for damages, including legal fees, to persons and/or property, tangible intangible or otherwise which may be brought against ABS incidental to, arising out of or in connection with the work to be done, services to be performed or material to be furnished hereunder, except for those claims caused solely and completely by the negligence of ABS, its agents, employees, officers, directors or subcontractors.

Any other individual or party who is a party hereto or who in any way participates in, is engaged in connection with or is a beneficiary of, any portion of the services described herein shall indemnify and hold ABS harmless from and against all claims, demands, lawsuits or actions for damages, including legal fees, to persons and/or property, tangible, intangible or otherwise, which may be brought against ABS by any person or entity as a result of the services performed pursuant to this agreement, except for those claims caused solely and completely by the negligence of ABS, its agents, employees, officers, directors or subcontractors.

15. ARBITRATION CLAUSE

Any and all differences and disputes of whatsoever nature arising out of this Agreement shall be put to arbitration in the City of New York pursuant to the laws relating to arbitration there in force, before a board of three persons, consisting of one arbitrator to be appointed by ABS, one by Client, and one by the two so chosen. The decision of any two of the three on any point or points shall be final. Until such time as the arbitrators finally close the hearings either party shall have the right by written notice served on the arbitrators and on an officer of the other party to specify further disputes or differences under this Agreement for hearing and determination. The arbitration is to be conducted in accordance with the rules of the Society of Maritime Arbitrators, Inc. The arbitrators may grant any relief which they, or a majority of them, deem just and equitable and within the scope of the agreement of the parties, including, but not limited to, specific performance. Awards made in pursuance to this clause may include costs including a reasonable allowance for attorney's fees and judgment may be entered upon any award made hereunder in any court having jurisdiction.

Client shall be required to notify ABS within thirty (30) days of the commencement of any arbitration between it and third parties which may concern ABS's work in connection with this Agreement and shall afford ABS an opportunity, at ABS's sole option, to participate in the arbitration.

Mark each for additional certification required:

- Loadline Assignment (If required, include Form LL4D)
- RMC Certification Swinging Load Certification
- Cargo Gear Register Union Purchase Certification
- Certification of Automated Control System in Engine Room: ACC (Attended)
- ACCU (Unattended) ABCU (Unattended)
- Inert Gas System
- Crude Oil Washing
- U.S.C.G. Regulations, as applicable for U.S. Flag Service Vessels

SAFETY OF LIFE AT SEA CONVENTION: (1974)

- Safety Radiotelegraphy Certificate
- Safety Equipment Certificate
- Safety Construction Certificate
- Passenger Ship Safety Certificate

IMCO CODE CERTIFICATIONS:

- Certificate Of Fitness Liquefied Gas Carrier Chemical Carrier
- Mobile Offshore Drilling Unit Other
(Specify)
- Marpol 73
- 1978 Protocols — Marpol 73

TONNAGE

- National Tonnage (1969 Convention)
- National Tonnage (Other)
- Suez Tonnage
- Panama Tonnage
- British Tonnage

If Other Certification Required, Indicate Below:

REQUEST FOR CLASSIFICATION SURVEY AND AGREEMENT

Date:

To: AMERICAN BUREAU OF SHIPPING
45 Eisenhower Drive
Paramus, N.J. 07652

Dear Sirs:

Please survey for Classification and publication in the "RECORD" OF THE AMERICAN BUREAU OF SHIPPING:

Vessel
Name Type (Specify)
Flag
For Existing Vessels, Former Name Date Built
Length B.P. Breadth Depth Design Draft
Length Overall Design Speed
Estimated Tonnages: Gross Deadweight
Estimated Keel Laying Date Estimated Delivery Date
Intended Service () Unrestricted () River
() Great Lakes () Other (Specify)

Owner
Address

Shipbuilder Hull No.
Address

Date of Contract between Shipbuilder and Owner

Type Propulsion Number of Screws
Engine Type
Maximum Continuous H.P. Per Engine Engine RPM
Builder Number of Engines
Boiler Type Size No. of Boilers
Builder
Reduction Gear Builder
Reduction Gear Model Gear Ratio
Electrical Propulsion Machinery Builder
Number and KW of All Electrical Generators
Horsepower of Each Prime Mover

Fees, plus expenses incurred, are to be paid whether Class be assigned or not.

THE UNDERSIGNED PARTIES ACKNOWLEDGE THAT ALL OF THE TERMS AND CONDITIONS CONTAINED IN PAGES 1 THROUGH 4 HEREOF HAVE BEEN REVIEWED AND THAT UNLESS OTHERWISE MUTUALLY AGREED IN WRITING, OR REQUIRED BY LAW, ALL SERVICES RENDERED IN CONNECTION WITH THIS REQUEST ARE GOVERNED BY THE TERMS AND CONDITIONS CONTAINED THEREIN.

(Name of Firm)

(Signed)

(Address)

IF OTHER CERTIFICATION REQUIRED. SEE REVERSE SIDE

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ANNEX F: A.I.D.'s HEALTH CARE DEVELOPMENT OBJECTIVES

The Agency for International Development supports the health care and child survival, population and family planning, malaria control and treatment, nutrition, and AIDS initiatives of host governments. In fiscal year 1992, A.I.D. obligated over \$450 million globally for health care, child survival and AIDS. An additional amount of \$147 million was expended world-wide on population family planning projects and non-project activities.¹

According to A.I.D. Missions' Program Performance Information for Strategic Management (PRISM) reports submitted to the Center for Development Information and Evaluation (CDIE) and regional A.I.D./Washington offices, the health care development assistance strategies of A.I.D. are to:

1. Focus resources on delivering the most effective known technologies;
2. Concentrate efforts on countries where the need is greatest and where U.S. assistance can make a difference;
3. Support programs with technical expertise and results-oriented research;
4. Involve the private sector in the delivery of health care services;
5. Collaborate with other donors and agencies to leverage and maximize the impact of A.I.D.'s assistance; and
6. Monitor and evaluate results.

Concerning child survival, A.I.D.'s strategy calls for a focus on (1) the management of diarrheal diseases through oral rehydration therapy (ORT), and (2) immunization against preventable childhood diseases such as measles, polio, diphtheria, and tetanus.

Concerning malnutrition, A.I.D.'s strategy for alleviating the effects of malnutrition is to promote breast-feeding; proper weaning foods; continued feeding during diarrhea; growth monitoring; vitamin A supplementation; and targeted supplementary feeding by training mothers and other family members.

¹ Obligated funds and expended money are not additive. Expended money reflects amount spent in the fiscal year, while obligated money simply reflects the amount granted in that fiscal year, whether or not it is spent.

In developing countries, many children die from measles, neonatal tetanus, whooping cough, and from causes associated from diarrheal diseases and malnutrition.² Others die from severe respiratory infections or malaria. Relatively few children die from diseases that require intensive care or specialized treatment.

In addition, in response to the need to strengthen administrative capacity for the effective and efficient delivery of health care services in host countries, A.I.D. provides assistance in three primary areas: human resources, management systems, and information systems development. A.I.D. has trained physicians and nurses; community health-workers and traditional birth attendants; other health-workers; mothers and other family members (grandmothers); and community leaders on oral rehydration therapy (ORT), immunization, nutrition and high risk births. Most of this training is conducted locally in the communities it serves.

Besides the creation of a pool of skilled personnel, the development of support systems to ensure that staff have the necessary physical, financial and technical resources is critical to the process of building up management capacity. A.I.D.'s efforts in this domain, however, are concentrated in strengthening management support systems and operations research. Creating management support systems for sustained programs requires solid planning and implementation including local programming capabilities, logistics administration of medical equipment and supplies, maintenance systems for cold chain operation vehicles, management and health information systems, human resources development, health financing, and mass media and educational promotion.

A.I.D.'s strategy is geared to developing and promoting the use of appropriate technologies using local material as much as possible and simple equipment and supplies for combating and treating diseases.³ Its training program is geared toward expanded coverage to promote wider access to health care by involving mothers, family members and community leaders. It would be impractical to bus or airlift a whole community to a ship for training purposes. Given the experience of the Navy, Project Hope and other land-based PVOs, there are no comparative advantages to using a hospital ship either for training or for the treatment of patients.

² Malnutrition is the term used to describe a complex of conditions occurring when an individual lacks one or more essential nutrients. The primary causes of malnutrition are a shortage of food, resulting in an inadequate intake of nutrients, and disease, which prevents the body from fully using the nutrients it does take in.

³ A.I.D. has supplied host countries with cold chain for vaccine shipment; sterilization equipment; simple lab equipment; hospital tables and beds for high risk pregnancy; fracture setting equipment; stitching; and family planning supplies.

Concerning A.I.D.'s health care development strategies, experience has proven that primary health care (PHC) and family planning (FP) are most practical cost-effective strategies for meeting the health care needs of developing countries. The focus of PHC and FP is the provision of essential health care by relying upon community resources. This approach involves indigenous people at the community level in the planning and delivery of their own health care.⁴ Family planning initiatives protect the health of the children and mothers by emphasizing birth spacing, neonatal care, and proper feeding.

These community level interventions form the foundation of A.I.D.'s strategy for improving the health status of persons in developing countries. A.I.D.'s community-based strategy means that the sophisticated treatment facilities of a hospital ship will not support the achievement of A.I.D.'s health care objectives. In fact, use of a sophisticated hospital ship undermines A.I.D.'s development strategy of using locally available personnel, technologies and facilities to strengthen indigenous capacity to provide health care.

Life International plans to supplement the hospital ship operation with mobile clinics for inland operations. It plans to operate in large metropolitan cities such as Lagos, Nigeria. Mobile operations are more effective at reaching and providing immunizations and other medical services to mobile and sparsely populated rural regions. They are, however, the least cost-effective means of service delivery in high density urban areas.

Studies of cost-effectiveness suggest that because of the high cost of fuel, vehicle maintenance costs (the useful life of a vehicle was two years), and per diem for local workers, on average, mobile operations are at least twice as expensive to operate than fixed health facilities. Immunization programs that have used mobile teams as an alternative means of reaching unimmunized children have discovered that the cost of mobile teams was twice that of fixed facility operations.⁵ For example, in Burkina Faso the cost of mobile teams was \$7.10 as compared to \$4.47 for fixed facilities per fully immunized child. In Mauritania, the cost of mobile teams was \$14.09 as compared to \$7.21 for fixed facilities per fully immunized child. The story is the same for the Sudan and Somalia. Life International, therefore, should consider the additional operating cost incurred against the incremental benefit generated from its mobile clinic operations.

Life International also has argued that navigable oceans and inland waterways reach the vast majority of the world's population, particularly the most impoverished. Life International also argues that about 70 percent of the world's population lives within 100

⁴ Ninety percent of child mortality can be avoided by safe water, sanitary condition, and health education resulting in good hygiene, safe water to drink, clean place in which to live, and nutritious foods to eat.

⁵ John Snow, Inc., Resources for Child Health (REACH) Project, The Cost of EPI: Lessons Learned from Cost and Cost-effectiveness Studies of Immunization Programs, September, 1990.

miles of navigable waters - on or near rivers, oceans or lakes; therefore, a hospital ship can reach and benefit a large majority of the world's poor. The issue, however, is not merely access to the poor; the real issue is the cost-effectiveness of delivery of health services to the poor. Although many of the world's poor can benefit from a hospital ship supplemented by land and smaller water self-contained vehicles, the high cost of operation the hospital ship and its mobile units may be prohibitive unless heavily subsidized by host governments, its employees and benefactors.