

Briefing Memo

Recent Trend of Naval Vessel Medical Equipment Improvements

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Foreword

Since the Vietnam War, medical evacuation methods using helicopters and transport aircrafts have made progress and, at present, the role of hospital ships in time of war has relatively declined. During the Vietnam War, U.S. hospital ships engaged in medical treatment for civilians in Vietnam and this became an opportunity for the U.S. force's hospital ships to be deployed for humanitarian activities afterwards. In the latter half of the 1970', the U.S. navy studied in detail speck required for hospital ships (a total of 2,000 beds required) and their cost performance. As a result, to date, the Navy possesses two *Mercy* class hospital ships made by reconstructing civilian tankers. Though this study did not assume the use of hospital ships for the purpose of humanitarian assistance in the case of a large-scale of disaster, *Mercy*, the first ship of the said class, was dispatched to the Philippine and the South Pacific area for humanitarian assistance three months after its commission (November, 1986). Until then, medical assistance using hospital ships had been done under the care of civilian organizations. However, since then, the U.S. Navy has directly deployed its hospital ships for humanitarian support. In recent years, in addition to the multi purposed use of dedicated hospital ships, another recent visible trend is the multi-purposing of naval vessels other than hospital ships with substantial medical equipment.

1. Decreasing hospital ships

The record of ships specializing in the treatment of sick and wounded soldiers (hospital ships) has been backdated to ancient Greece and Rome. The services of those ships ceased during the middle ages, but from the 17th and 18th centuries, the naval powers of the U.K., France, Spain and the Netherlands always had hospital ships in reserve. In addition, U.S. and Japan also started full operation of hospital ships after the Civil War (1861-1865) and the Sino-Japanese War (1895-1895) respectively. To keep up with these developments, legal adjustments to protect hospital ships in time of war were implemented and this led to the "Adaptation to Maritime Warfare of the Principles of the Geneva Convention of 22 August 1984" which was signed in 1899 (Japan joined the convention when it was concluded). Countries participating in World War I and II made large-scale use of hospital ships.

By the way, there have existed two major streams of thought regarding hospital ships since World War II. One has been the multi-purpose use of hospital ships, namely to utilize them for medical

assistance in time of peace. The other has been to equip complete medical facilities on military vessels to substitute for hospital ships. In recent years, even advanced nations cannot afford to construct and operate a hospital ship from a financial point of view. At present, only the U.S., China and Russia possess dedicated hospital ships to which international law is applicable (See the table below). In addition to medical activities during the Gulf War (1991) and the Iraq War (2003), U.S. *Mercy* class hospital ships engaged in assistance to Haitian refugees (1993-94), the Indian Ocean Earthquake and Tsunami damage assistance (2004), assistance to Haitian refugees (2004), Hurricane Katrina damage aid (2005), Haitian Earthquake aid (2010), etc. The *Mercy* deployed on the West Coast (San Diego) also frequently participates in multi-national medical support training (for example, "Pacific Partnership").

China is second to the U.S. in large scale hospital ships and is also assertively operating them. A *Daishandao* class (Type 920) hospital ship, put into commission in 2008, is equipped with the latest medical equipment and is actively conducting medical assistance activities for the countries of Asia, Africa and Latin America. As for Russia, the country improved four *Ob* class hospital ships from 1980 to 1990 (One of them was already decommissioned). However, the Russian hospital ships function as naval base medical facilities in time of peace and never engage in medical assistance activities, in contrast to the hospital ships of the U.S. and China.

2. Developments in naval vessel medical equipment improvements

Instead of constructing hospital ships, there is an increasing trend toward the substitution of hospital ships with naval vessels with improved medical facilities. On the premise of deployment to non-traditional military services such as humanitarian assistance and disaster relief (HA/DR) operation, there is a tendency to fully equip amphibious assault ships with medical facilities (however, these are not recognized as hospital ships under International Law). For examples, it is generalized that an amphibious ship of full load displacement of 15,000 – 25,000t also has medical facilities of 20 – 50 beds. In an amphibious operation, while amphibious ships become the bases of operation, it would take much time to send wounded soldiers, etc. back to their home country. Therefore it is logical to prepare medical equipment on these military ships.

Furthermore, in the case of U.S. forces, though the medical facilities of an amphibious assault ship constructed after the commission of a *Mercy* class hospital ship has, on the surface, been greatly reduced (from 600 beds of the *Peleliu* to 64 beds of the *Wasp*), it is possible to increase beds by 200 by transforming the Marine resident areas to general sick bed areas in the case of the *Wasp* class (According to the U.S. Navy web site, *Tarawa* class vessels can provide medical aid for 600 people). Furthermore, the Netherlands Navy's *Rotterdam* and its improved and expanded ship *Johan de Witt* have 7 sick beds each, and are capable of accommodating 100 patients in the soldiers' residence areas in emergency. In general, an amphibious assault ship can increase the number of patients to be accommodated by transforming the landing soldiers' residence area as necessary. Moreover, an amphibious operation ship has helicopter and landing craft operation capabilities effective for operations in developing counties with insufficient

port facilities or where ports were damaged by disasters.

Table: Hospital Ships and Major Naval Vessels with Medical Equipment

Nation	Ship's Name	Year of Commission	Displacement	No. of bed	Ship of the Same Class	Remarks
Hospital ship for Military						
USA	<i>Mercy</i>	1986	70,473 t	1,000	2	12 Operating rooms
CHN	<i>Daishandao</i> (Type 920)	2008	23,369 t	300	1+(1)	8 Operating rooms
RUS	<i>Yenisei</i> (<i>Ob</i> class)	1981	11,756 t	100	3	7 Operating rooms
Major Naval Vessels with Medical Equipment						
USA	<i>Nimitz</i>	1975	74,086t	80	10	Aircraft Carrier
USA	<i>America</i>	(2014)	44,971t	24	0+2(3)	
USA	<i>San Antonio</i>	2006	25,586t	24	6+4(1)	
USA	<i>Wasp</i>	1989	41,302t	64	8	
USA	<i>Peleliu</i> (<i>Tarawa</i> class)	1980	40,608t	600	1	
GBR	<i>Argus</i>	1988	26,845t	(100)	1	Aviation Training Ship
FRA	<i>Mistral</i>	2006	21,947t	69	3	
FRA	<i>Siroco</i> (<i>Foudre</i> class)	1998	12,599t	47	1	
GER	<i>Berlin</i>	2001	20,565t	94	3	Replenishment Ship
ITA	<i>Cavour</i>	2009	27,535t	32	1	Light Aircraft Carrier
NDL	<i>Rotterdam</i>	1998	12,955t	7	1	
NDL	<i>Johan de Witt</i>	2007	16,948t	7	1	
ESP	<i>Juan Carlos I</i>	2010	27,514t	22	1	
ESP	<i>Galicia</i>	1998	14,037t	12	2	
AUS	<i>Canberra</i>	(2014)	27,500t	22	0+2	
RUS	<i>Vladivostok</i>	(2014)	21,000t	63	0+2(2)	
INA	<i>Dr. Soeharso</i>	2003	11,583t	20	5	
JPN	<i>Izumo</i>	(2015)	24,000t	35	0+1(1)	Helicopter Destroyer
JPN	<i>Hyuga</i>	2009	18,289t	8	2	Helicopter Destroyer
JPN	<i>Masyuu</i>	2004	25,401t	46	2	Replenishment Ship
JPN	<i>Osumi</i>	1998	14,225t	8	3	

Note: Displacement shows full load displacement in principle. The column "Ships of the Same Class" shows "Number of ships in commission + Number of ships under construction (Number of ships under planning)". In the U.S., One *Gerald R. Ford* class aircraft carrier is under construction and it seems to have medical equipment equivalent to that of the *Nimitz*. The *America* class is to be an update of the *Wasp* class, and two *America* class ships are currently under construction. Australia (AUS)'s *Canberra* class, a quasi-same class vessel as Spain (ESP)'s *Juan Carlos I* class, is under construction and will be commissioned sequentially from the year 2014. The Netherlands (NDL) *Rotterdam* and Spain's *Galicia* class are quasi-same class ships. The number of beds of the U.K. (GBR)'s *Argus* includes the number of medical module containers when they are

loaded. Russia (RUS)'s *Vladivostok* class is the same class as France (FRA)'s *Mistral* class. Other abbreviations stand for as follow: CHN (China), GER (Germany), ITA (Italy), INA (Indonesia), JPN (Japan).

Source: Web sites of *Jane's Fighting Ships 2012-2013*, Francisco Javier Álvarez Laita, et al. 'Amphibious Warfareships: The Navantia Achievements,' (Madrid: Information & Design Solutions, Aug. 2011), the Cabinet Office (Disaster Management) "The report on the investigation of a multi-purpose ship (hospital ship) for disaster" (March, 2013), Global Security and NATO Defense College.

3. Medical equipment improvement of Self-Defense Force's Ships in Japan

The possession and utilization for diplomatic means of a multi-purpose hospital ship had also been discussed in Japan since the Cold War era, but was presented with the opportunity to start a concrete study with the Gulf Crisis in 1990. The government established "The Investigation Committee for Multi-Purpose Ships" made up of relevant ministries and agencies in 1991 which carried out a data collection until 1995. When the Great Hanshin and Awaji Earthquake (Kobe Earthquake) occurred in 1995, the possession of a hospital ship was widely discussed again. At that time, the Japan Coast Guard also conceived of introducing a patrol boat with a hospital function of 150 beds. The patrol vessel *Izu* constructed under the FY1995 supplementary budget, however, had only two beds though it was equipped with medical equipment and facilities as a disaster prevention headquarters. Subsequently, "The Investigation Committee for the Basic Plan of Multi-purpose Ships" made up of experts and working-level officials was set up two years after the Kobe Earthquake (1995) and the Committee report was submitted in March, 2001. During this time, however, the *Miura* in addition to the *Izu* was constructed as a patrol vessel to cope with disasters, and moreover three *Osumi* class transport ship of the Maritime Self-Defense Force (MSDF) with medical facilities were constructed. For this reason, it was concluded that roles required for "a multi-purpose ship" were mostly achievable by utilizing these ships.

When the Great East Japan Earthquake (Tohoku Earthquake) occurred in March, 2011, the above trend changed considerably. In December of the same year, "The Task Force on Multi-Purpose Ships in time of Disaster" was established in the Cabinet Office (Disaster Management) and respective costs of constructing a new ship, reconstructing a used ship and utilizing a civilian container ship (a medical module container is used in this case) were also widely discussed including how to raise funds (by introducing private funds, etc.). Apart from these intra-government studies, civilian organizations have offered various kinds of opinions about the possession of a hospital ship and a multi-purpose assistance ship. Many of them suggest that enhancement of a secondhand ship or practical use of a medical module container should be adopted, without constructing large scale hospital ships (of 500 beds or more), in order to hold total costs down. In addition, the suggestion refers to not only giving medical assistance in the case of a domestic disaster, but also for utilization as a travelling clinic, international contribution and medical education, which is similar to the conclusion of the intra-governmental task force.

In Japan, with regard to ships having medical treatment functions and hospitalization facilities, the MSDF has 12 ships, a total of 174 beds and the Coast Guard has 2 ships, with a total of 4 beds at

present. Other than these ships, there are medical treatment ships (without hospitalization facilities) owned by civilian medical institutions. The largest of the ships above is a *Masyuu* class supply ship of the MSDF (25,401t, 46 beds) which has a facility equivalent to a small hospital (for examples, the Self-Defense Force Misawa Hospital has 50 beds). Furthermore, an *Osumi* class transport vessel is capable to load Ground Self-Defense Force's field surgery systems. Actually, in the verification training conducted in August, 2013, the said systems were deployed on a deck and 50 sick beds, as well as surgery rooms and X-ray equipment, were additionally installed. Other nations also make an attempt, as described above, to set up a medical module container, etc. on an existing military ship and expand medical equipment as necessary. For instance, the U.K. Navy's aircraft support ship *Argus* (which was a civilian container ship originally) is able to place 100 sick beds by installing medical module containers and the German Navy's *Berlin* class supply ship (having 94 beds) can increase by 50 the number of beds with the same kind of container. In addition, the Chinese Navy's aircraft training ship *Shichang* (10,000t) also has the capability to set up medical equipment by installing medical module containers (the ship is not listed in the table because detailed information is not disclosed). Furthermore, the Ministry of Defense plans to make efficient use of private funds so that civilian ferries can be utilized to transport Self-Defense Forces in case of an emergency. Though the ship (*Natchan World*), which reportedly is planned to be utilized for this purpose, has no capability to operate helicopters, its other capabilities are equivalent to that of a High Speed Vessel class ocean-going enabled high speed hospital ship which the public service corporation "Mobile Hospital International" advocates.

4. Future prospects

While non-traditional services by the military such as HA/DR operation become increasingly important, a dedicated hospital ship is unlikely to be cost-effective. For this reason, as far as HA/DR operation by the military are concerned, a growing trend is for substituting hospital ship functions by improving the medical equipment of the ships (namely multi-purposing the ships) such as aircraft carriers and landing ships, transport ships and supply ships which are large and capable of operating helicopters. In Japan, the MSDF, in alignment with this trend, has set up its large ships with medical facilities.

However, medical assistance in time of disaster only functions as a bridge until local medical institutions are restored. Therefore it is required to consider how to operate these ships including a hospital ship according to this policy from now on. As for patients who are ill or require surgery, medical follow-up and rehabilitation after treatments are occasionally required. In case of illnesses contracted due to life at an evacuation site, it is often necessary to provide long term medical attention. It is not feasible to implement such meticulous treatment without community-based medical institutions. Some experts insist that priority should be given to restoring damaged hospitals in the case of a great disaster and that ad-hoc medical organizations including hospital ships are rather inefficient. Though each nation's navy possesses many hospital ships and ships with medical equipment as shown in the table above, no remarkable performance of HA/DR operation currently stands out other than the U.S. *Mercy* class

hospital ships.

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Jane's Fighting Ships 2012-2013

(Completed on May 7, 2014)

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