

2022. 01 Vol. 1

A novel approach to constructing  
a disaster safety net

# Total Solution for Underwater Cables

- Hybrid Cable
- Military Cable
- Towing Cable
- Umbilical Cable
- Submarine Cable
- Underwater Cable



*KIMS UBQ*

## KIMS UBQ is

a company that manufactures fiber optic & electric composite cables for underwater signal transmission required for Harbor Underwater Surveillance System to protect harbors and major facilities from enemy submarines, unmanned submersibles and semi-submersibles penetrating into the water. KIMS UBQ also manufactures underwater towing cable assemblies for the SONAR system that are installed on surface ships (destroyers, frigates, mine battleships) and submarines.

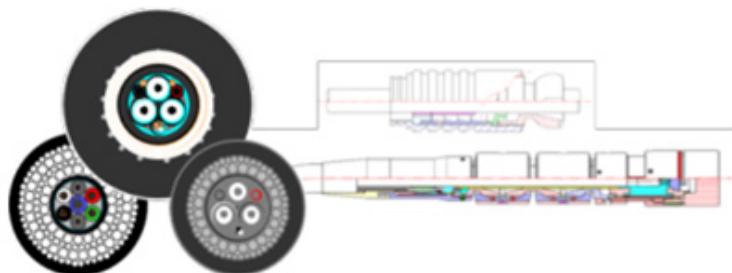
KIMS UBQ is the only company in Korea with unrivaled competitiveness in the subsea fixed and towed special cable market that localizes various composite cables and underwater towing cable assemblies to replace imports and export them overseas.

KIMS UBQ is a Small Giants company with superior technology than very few overseas high-tech companies in the global market for various complex cables and underwater towing cable assemblies.

## New technology of KIMS UBQ

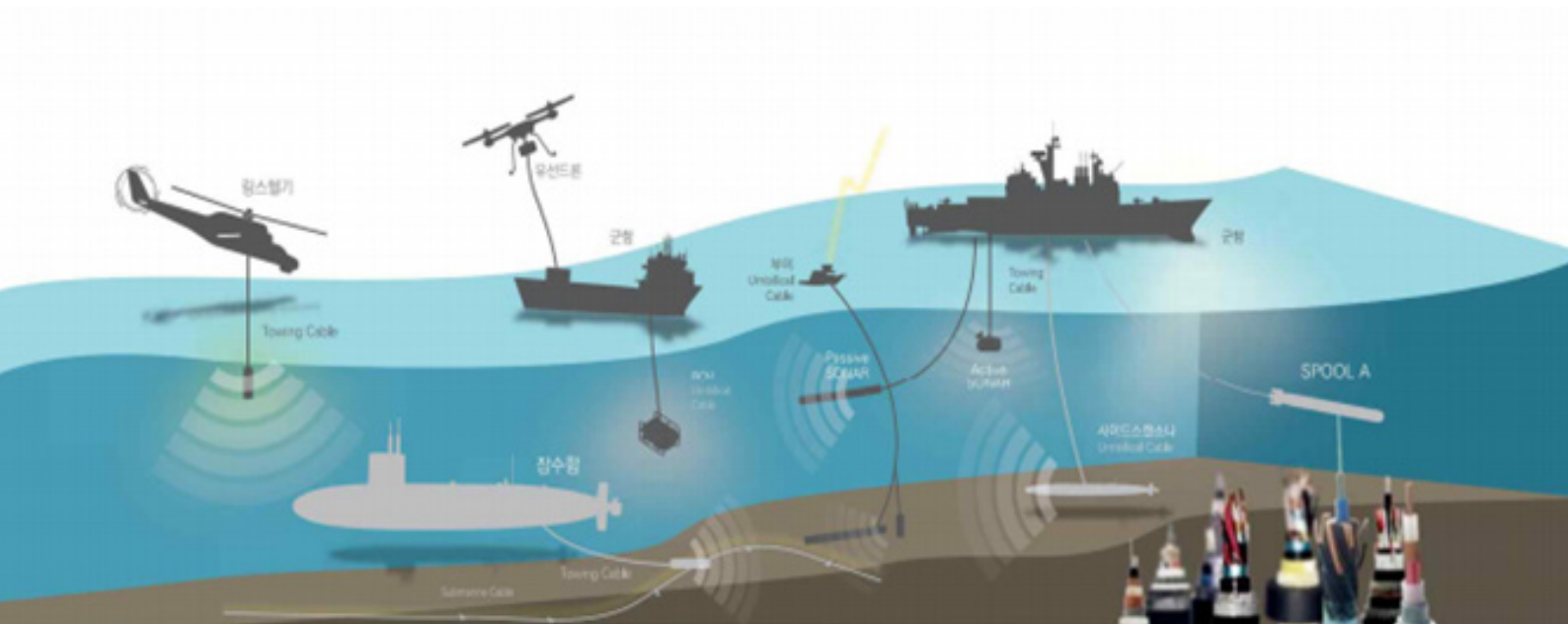
KIMS UBQ has successfully localized the new TASS (FTASS) cable for the Korean Navy based on “underwater towing cable manufacturing technology” certified by the Ministry of Oceans and Fisheries for NET new technology. KIMS UBQ will supply TASS cables used for new frigates (FFG) and destroyers (DDH-I, II, III). KIMS UBQ also participated in the “KDX-III integrated SONAR system research and development project” of the Defense Science Research Institute (ADD) and completed the development of a high-level product that withstands the extreme underwater environment of 138 bar water pressure.

KIMS UBQ will also participate in the R&D of integrated SONAR system cables applied to KDDX (Korean Mini Aegis Ship) in the future. The underwater towing cable assembly developed by KIMS UBQ for military use has been extended to the civilian use area and is being applied in the following civilian areas: ROV (crabster) Umbilical system of Korea Shipbuilding & Offshore Research Institute (KRISO), sound source of Korea Institute of Ocean Science and Technology pressure compensation system.



Underwater cable manufacturing & cable plant solution

# KIMS U BQ



## KIMS CABLES & WIRES

- Submarine Cable / Towing Cable
- Umbilical Cable / Military Cable
- Hybrid Cable / Factory Automation Cable



KIMS U BQ

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New Excellent Technology  
신기술인증

New Maritime and Fisheries Technology No. 2017 - 08  
Underwater towing cable

## Company History

### 2005 ~ 2010

**2005**

**Establishment of KIMS UBQ Co., Ltd**

**2006**

**Development of NAIMS Project**

- LIG Nex1 / Hanwha
- Supply of fiber optic & electric composite cables (8.3 km) from the seabed
- Supply of sensor cable (1.9 km)

**2006 ~ 2008**

**Participated in the development of the Korea Meteorological Administration and Ulleungdo Project**

Completed development of submarine fiber optic & electric composite cable for earthquake and tsunami sensing system

**2008**

**Exported Cable Plant to Uzbekistan**

Uz Erae Automobile Cable Plant  
Export to Turkey (equipment + technology)

**2010**

**Received large orders for submarine cables for harbor monitoring systems**

- Establishment of mass production facilities
- Completed development of subsea cable mass production technology (Completion of Copper Tubing Technology)

### 2011 ~ 2015

**2012**

**Incorporated into Woobang Cable's subsidiary**

**INNO BIZ Certification of Technology Research Center**

**Certification for venture companies**

**2013**

**Ulleungdo-Dokdo Project**

KIOST/Hanwha  
Development of multi-purpose submarine optic & electric composite cable and underwater sensor cable

**2014**

**Acquisition of ADD civilian/military combined technology development project [4.5 billion / 3 years]**

- Development of an underwater towing cable
- Development period: 2014 ~ 2017

**2015**

**Construction of underwater tug cable mass production facility**

- Development of 2,000PSI connection termination
- Manufacturing and environmental equipment for mass production

### 2016 ~ 2019

**2016**

**Development of Boy-type Project**

- Development of sensor and signal transmission cable (Back Bone Cable) assembly and fairing technology [480 million]

**Certification for core parts by Defense Technology and Quality Agency [DTaQ]**

- Selected as the host company for the localization support project [4.8 billion / 3 years]
- Development of heavy and light cable assembly of optical communication method for towing sonar

**2017**

**Participation in "ADD, Gwanggaeto-III, Batch-II (KDX-3) integrated SONAR system cable assembly development project" [2.7 billion] - Hanwha**

**2018**

**Acquired NET new technology recognition by the Ministry of Oceans and Fisheries**  
Received a commendation from the Director of Defense Acquisition Program Administration:  
**Performance of Civil-Military Technology Cooperation Project**

**2019**

**Grand Prize of the Minister of Oceans and Fisheries**

- Technology Award for Ocean and Fisheries Science



Submarine cable manufacturing & cable plant solution

# KIMS UBQ

## Core Technology

### 2020 ~ 2022

#### 2020

**Selected as a weapon system remodeling and development support business by the Technology Quality Assessment Service**

- Underwater towing cables and submarines
- Underwater cables [3.4 billion/3 years]

**Signed contract for unmanned water vehicle (SUV) AQS-24 NDA**

**Commendation from the Minister of National Defense: Selected as an excellent defense contractor**

Supplied tug cables for sound pressure compensation system to KIOST (Korea Institute of Ocean Science and Technology)  
Exported underwater towing cables (FOTC, FOCC) to ASELSAN, Turkey

#### 2021

**LIG Nex1 Defense Science Research Institute (ADD) wins contract to develop cable assembly for KDDX integrated SONAR system Naval Logistics Command Umbral Cable Assembly [Equipment**

**Name:** Guided Missile Ship Launch Equipment, Sea Sparrow] Part Development Agreement

**Defense Technology Promotion Research Institute, weapon system parts localization development support business agreement**

- KSS-II submarine hull-attached array station or cable wiring device [Amount 2.5 billion won, 3 years]
- 3 types of underwater towing cable assemblies for submarine [Amount 7.6 billion, 3 years]

### 1. Intellectual property rights

Patent – title of invention	Registration NO.
1. Manufacturing method for underwater weight towing cables	10-0822705
2. Submarine Composite Cable 1	10-0917860
3. Submarine Composite Cable 2	10-1030015
4. Phase-comparison type direction finding antenna	10-1256017
5. Estimation method for each bias of satellite tracking antenna using GPS position data of regular orbit satellites	10-1095036
6. Artificial magnetic conductor and antenna for adjacent band separation	10-1313497
7. Built-in axle truck scale	10-1736878
8. Junction box supply device	10-1768004
9. Multi-antenna transport apparatus and method for terrestrial DTV broadcasting and additional data	10-1772559

### 2. NET(New Excellent Technology) Certification for new technologies

Manufacturing technology of underwater towing cable / Ministry of Oceans and Fisheries – No. 2017-08 / 2 Jan 2018

### 3. Technology evaluation (Evaluation agency: Korea Institute of Ocean Science and Technology Promotion, Target: special submarine cable manufacturing technology)

Technology evaluation score: 83.87 points, Technology evaluation grade: T2

### 4. Development Capability Assessment (Evaluation Agency: Defense Science Research Institute ADD)

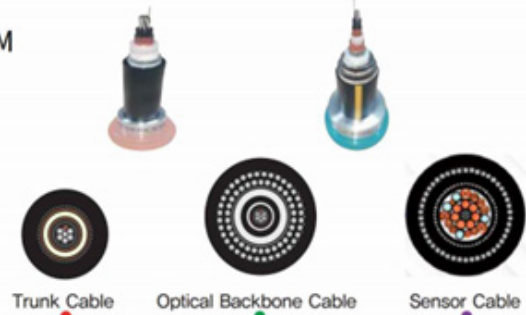
Civil-military task agreement number UM14301RD (3 Jun 2014)  
"Underwater towing cable" Success/Excellence (89.0 points)

### 5. Papers and technical reports

- Korean Association of Military Science and Technology ISSN 2636-0659 "Joint Design for Towing Body with Variable Depth Considering Pairing Cable"
- Korea Military Science and Technology Association "Light loss design of multi-functional towing cable assembly considering operating environment"
- Korea Military Science and Technology Association "Termination design considering tension and bending of underwater towing cable assembly"
- Defense Acquisition Program Administration 14-CM-EE-06 "Development of an underwater towing cable [TACM]"
- Defense Science Research Institute ADD "Variable depth towing cable assembly (LTC) detailed design report [KDX-3, B-2]"
- Defense Science Research Institute ADD "Multifunctional towing array cable assembly (MTC) detailed design report [KDX-3, B-2]"

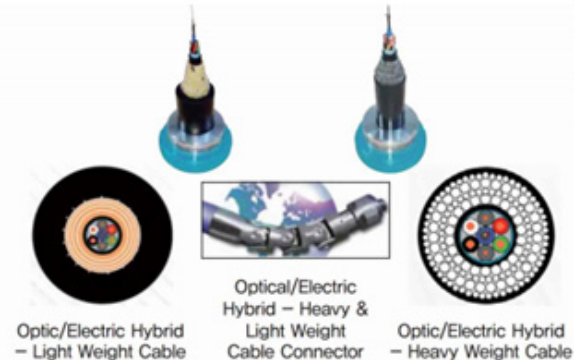
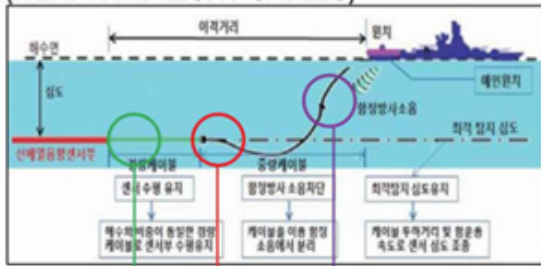
Fixed type

**HARBOR UNDERWATER SURVEILLANCE SYSTEM**



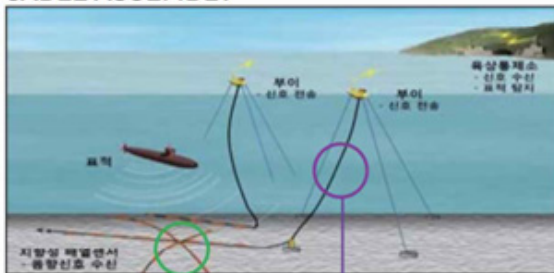
Moving type

**TOWING CABLE ASSEMBLY (HEAVY AND LIGHT CABLES)**



Buoy Type

**BUOY TYPE UNDERWATER SURVEILLANCE CABLE ASSEMBLY**



Cable Assemblies for Mining Systems



Umbilical Cable Assemblies for ROV(Crabster)



TETHERED DRONE CABLE







## Partners & Customers

### Korean Firms

Hanwha	Hanwha Corporation	국방과학연구소 Agency for Defense Development	Defense Science Research Institute
한화시스템	Hanwha Systems Co., Ltd.	국방기술품질원 DTaQ	Defense Technology and Quality Institute
LIG 넥스원	LIG Nex1	국방기술진흥연구소	Defense Technology Promotion Institute
DSME	Daewoo Shipbuilding & Marine Engineering Co., Ltd.	KIOST 한국해양과학기술원	Korea Institute of Ocean Science and Technology
STX Engine	STX Engine Co., Ltd.	KRISO 선박해양플랜트연구소	Ship and Offshore Plant Research Institute
MOTTROL	Mottrol Co., Ltd.	해양수산과학기술진흥원 Korea Institute of Marine Science & Technology Promotion	Institute of Oceans and Fisheries Science and Technology Promotion
taihan	Taihan Electric Wire Co., Ltd.	수중건설로봇사업단 UCRC	Underwater Construction Robot Project Team
GAON	Gaon Cable Co., Ltd.	한국로봇융합연구원 KIRO	Korea Robot Convergence Research Institute
서희건설	Seohee Construction Co., Ltd.	한국지질자원연구원 KIGAM	Korea Institute of Geoscience and Mineral Resources
세안이엔씨	Sean ENC Co., Ltd.	한국기계전기전자시험연구원 KTC	Korea Institute of Machinery, Electrical and Electronic Equipment

### Overseas

NORTHROP GRUMMAN	Northropgrumman (U.S.A)	SAFRAN	Safran(France)
LEONARDO	Leonardo(Italy)	aselsan	Aselsan(Turkey)



A new formula for national security and economic growth

# Civil-Military Cooperation Plus

●  
Civil-Military  
Cooperation Plus  
2018.12 Vol.8

## Success Stories Spin-Up

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**KIMS UBQ leading global  
technological innovation**

Dec 2018 Vol.8



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**[Civil-Military Technical Cooperation]**

**Undersea exploration**

**Robot's sticky lifeline**

Jan 2019



16

**Development of an underwater  
towing cable**

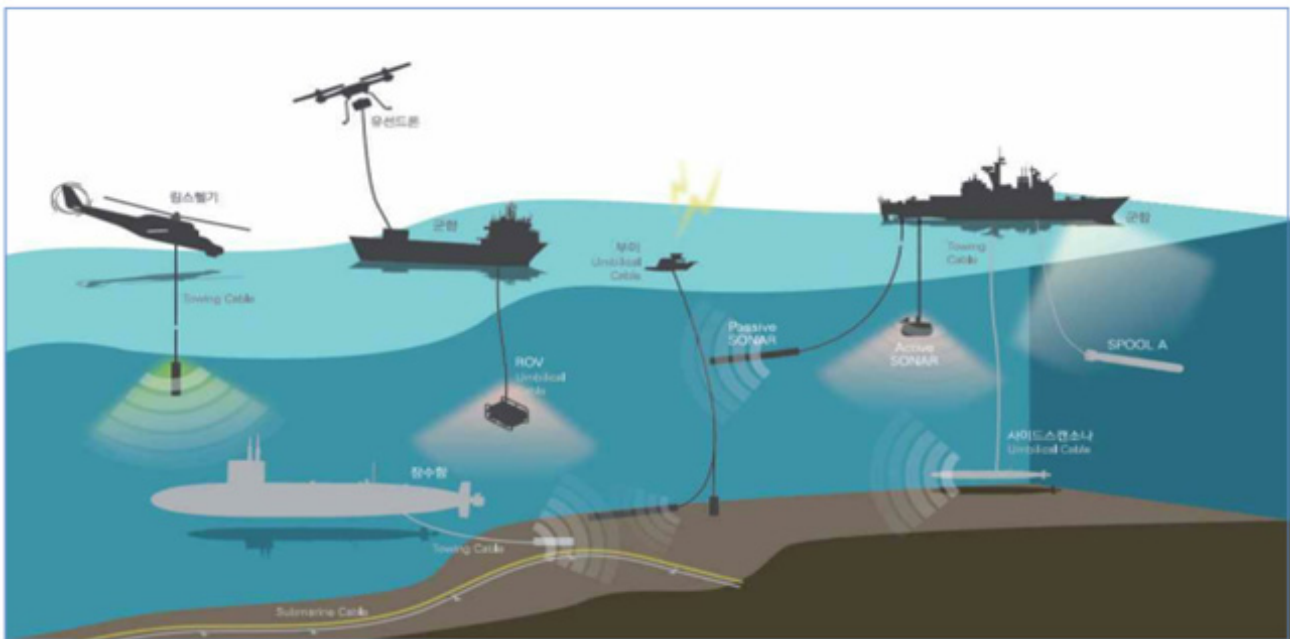




# Underwater towing cable

Host research institute\_ KIMS UBQ Co., Ltd.

Participating research institute\_ Woobang Cable Co., Ltd., Imaging Polytechnic



Founded in 2005, KIMS UBQ (CEO Tae-Yeop Kim) is a Small Giant company that professionally designs and manufactures fixed and towed Underwater cables with optimal engineering for each use to meet the diverse needs of customers.

KIMS UBQ has developed core design technology, material technology, mass production technology, and evaluation technology suitable for the submarine environment. KIMS UBQ, which has been recognized for this technology by the Korean government, has acquired national R&D projects and has successfully carried out various projects. KIMS UBQ has succeeded in entering the military market by localizing imported products. KIMS UBQ has been pursuing shared growth even in the civil market by providing high quality and customized solutions.

## leading global technological innovation

# KIMS UBQ

KIMS UBQ is a Small Giants company that designs and manufactures marine exploration cables, SONAR systems, magnetic field systems, and underwater cables of electric field systems for each purpose (fixed type, mobile type) with optimal engineering technology.



[Heavy Cable] [Light Cable] [Private Cable]

KIMS UBQ participated in the Naval Acoustic Information Management System "NAIMS" project jointly with Hanwha in 2006 to develop a fixed underwater optical power complex signal transmission cable for the port monitoring system for the first time in Korea.

NAIMS refers to a system that can collect and analyze ship sound information and marine environment data, then manage and disseminate it.

NAIMS supports and manages the acoustic information system required for ships and airplanes performing anti-submarine operations, such as surface ships, submarines, and anti-submarine patrol aircraft.

KIMS UBQ also supplied the cable through the Navy's Munmu Project when the sinking of the Cheonan occurred in March 2010. KIMS UBQ completed the localization of the underwater towing cable, which had been entirely dependent on imports, by carrying out the development task of 'Underwater Towing Cable', a civil-military technical cooperation project in 2015.

This is an improvement and localization of the cable used for the sound detector (SONAR) of existing warships.

The acoustic detection system mounted on a warship is largely composed of a cable assembly, a sensor, and a winch.

This is a type of mobile marine monitoring system that collects and transmits acoustic information by connecting a sensor to the end of a cable assembly installed on a ship.

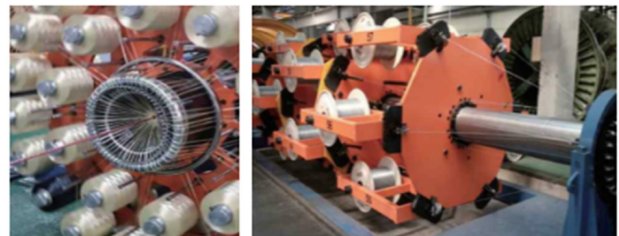
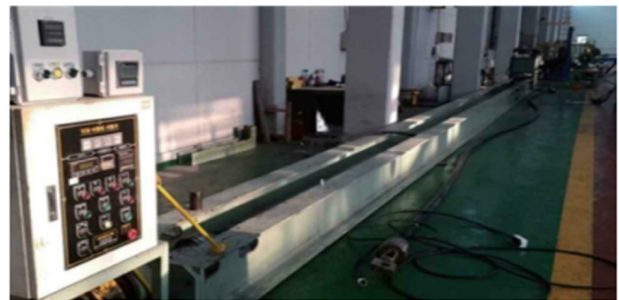
Based on these achievements, KIMS UBQ localized the towing cable assembly used in the "KDX-III integrated SONAR system".

KIMS UBQ succeeded in localizing the underwater towing cable, which was entirely dependent on imports.

The underwater towing cable is a high-level product that has to withstand the extreme submarine environment, withstands 6,000m water depth, 138bar pressure, and possesses advanced technology with a tensile strength of 50 tons.

KIMS UBQ applied this technology to the umbilical cable of Crabster of the Korea Marine Plant Research Institute (KRISO) by using this technology for civilian use.

In 2018, KIMS UBQ acquired NET new technology certification for 'underwater towing cable manufacturing technology' from the Ministry of Oceans and Fisheries. KIMS UBQ has been developing and validating a new portable towing cable. KIMS UBQ plans to apply the towing cable to offshore plant projects and submarine exploration robot areas in the future.

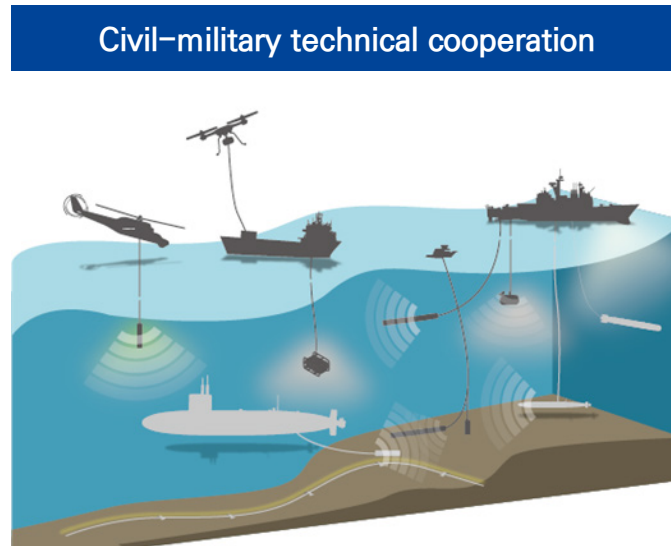


Taeyup Kim, CEO of KIMS UBQ, said, "The detection technology itself is sensor-based, but submarine cables are key components that not only maintain sensors and supply strategies, but also secure and transmit information. Therefore, KIMS UBQ will complete all subsea underwater cable products for civil and military use, and as there is no competitor in Korea, we will stand shoulder to shoulder with very few foreign companies on the global stage."

He mentioned, "The military use is already widely known, but the civilian products have been used for marine resource development, exploration, and polar exploration. KIMS UBQ started marketing in earnest for civilian products from now on. KIMS UBQ, in cooperation with Global EPC Partners and GK Sevcable, participated in the development of the Sakhalin LNG expansion project, the Baltic LNG liquefaction project, and the supply of submarine cables. KIMS UBQ plans to supply umbilical cables to Italy and Turkey."

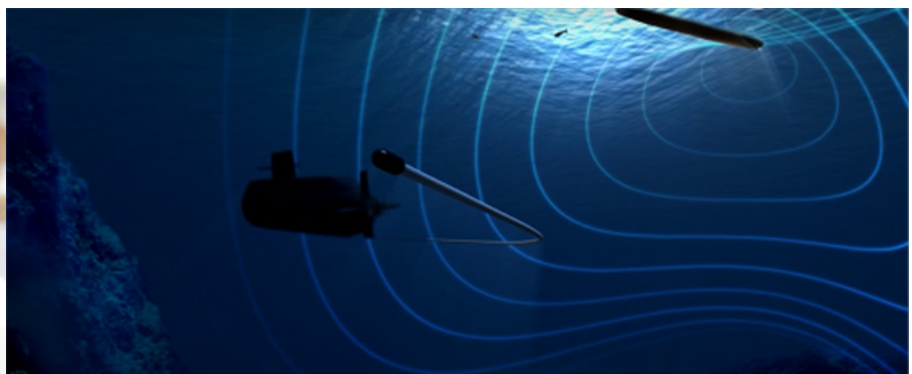


## [Dual use technology project] The sticky lifeline of underwater exploration robots



When we go to the hospital because of something wrong with our body, the first thing doctors do is. What is it? Doctors use a stethoscope to hear various sounds in our body. This allows the doctor to check where the patient is sick and take appropriate action. Just as doctors use a stethoscope to find out the name of a disease by listening to the sound inside their body, soldiers also use the technology to listen to the sound of the water with a machine and detect enemy ships or submarines. That technology is 'SONAR (Sound Navigation And Ranging)'.

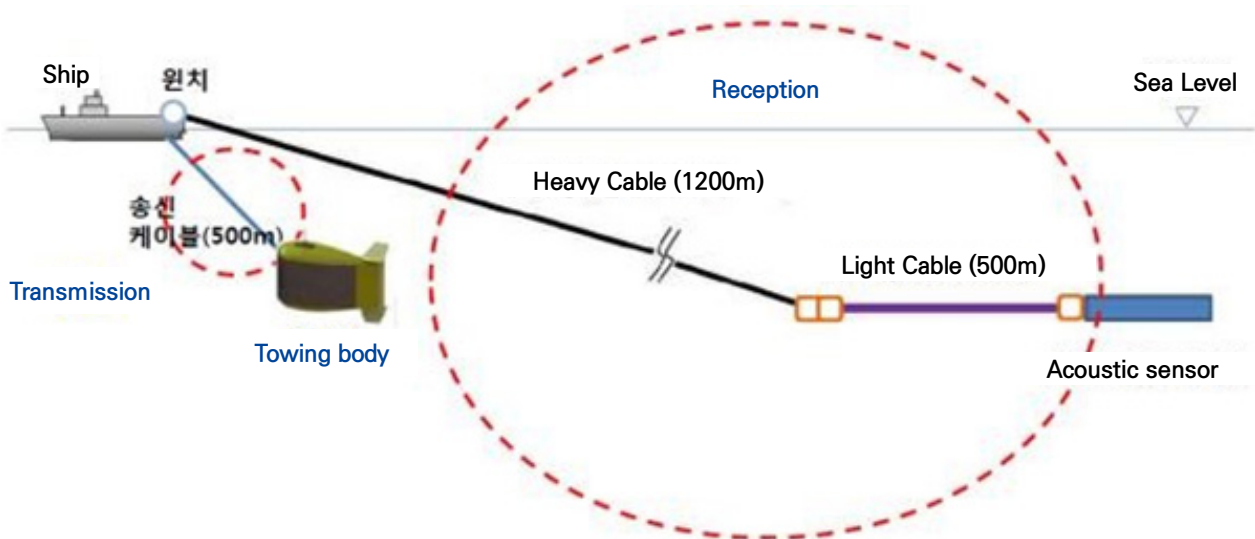
Sonar is a sound detection device that detects objects in the sea through sound waves. The clear sound of 'ping', which is often heard in submarine-related movies, is the sound of SONAR. In fact, it is so dark in the sea that it is impossible to see things with the naked eye. Even if radar is used, the electromagnetic waves emitted by radar have a lot of energy loss in the water, so it is difficult to detect because it travels only a very short distance.



## Sound detection equipment, a key component that maintains the SONAR system! ‘Underwater towing cable’

SONAR can also be used to collect and transmit acoustic information from enemy ships by suspending sensors at the end of a cable assembly from the ship.

However, since the water pressure in the sea is very high, the ‘cables’ that make up the SONAR system must be able to withstand high tensile strength (the maximum strength that the material under tension can withstand without being torn).



Source: Journal of the Korean Military Science and Technology Association, Vol. 19, No. 5 (October 2016)

Therefore, it is necessary to have a cable with technology that can move while stably maintaining the SONAR system even in extreme underwater environments. This is the ‘underwater towing cable’.

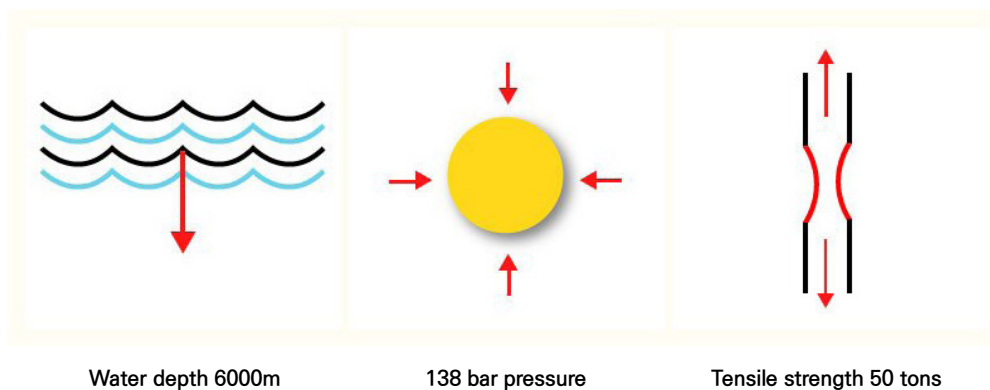
In the past, Korea did not have the technology for ‘underwater towing cables’, so the domestic SONAR system was highly dependent on foreign products.

What will happen if the cables that make up SONAR are broken and cannot be imported from abroad? If this happens, the SONAR system will also become useless, failing to detect the enemy, posing a major threat to our security.



Accordingly, the "Agency for Defense Development" (ADD) has been working with a private company (KIMS UBQ) to promote the 'development of an underwater towing cable' as part of dual use technology cooperation since 2014, and succeeded in localization in 2017. Therefore, this underwater towing cable was listed as a 2018 Dual use Technical Cooperation Excellence Performance.

### Underwater towing cable technology



The underwater towing cable developed with domestic technology consists of a cable that supplies power and a cable that enables data transmission and communication.

This cable can withstand a depth of 6,000 m and a pressure of 138 bar, and its tensile strength is as high as 50 tons.

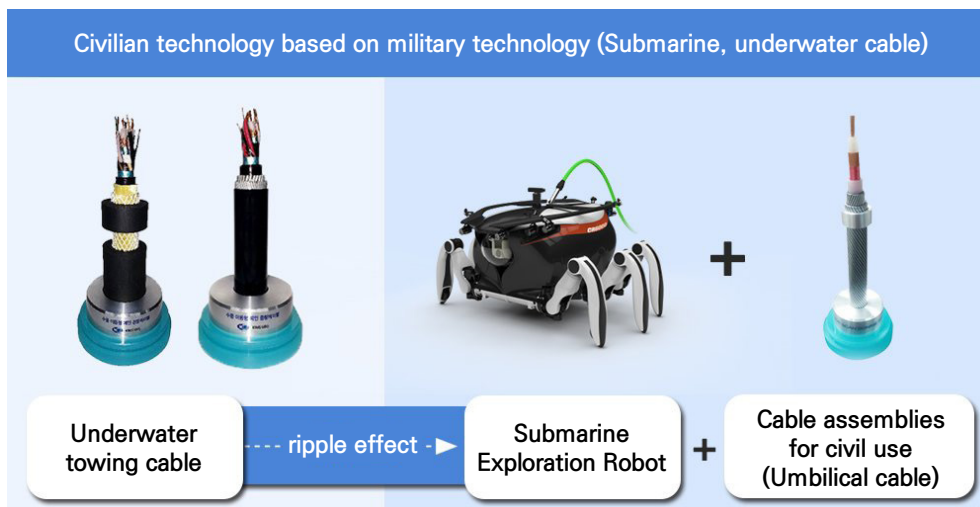
It allows SONAR to withstand high water pressure even in the depths of the sea and reliably detect enemies. In addition, the problem of cable tangling can occur while moving underwater.

However, the underwater towing cable has the technology to move stably without twisting even in the water. Such achievements clearly show that 'civil-military technical cooperation', in which the military and private companies develop technologies together, exerts a high synergy effect.



## ‘Underwater towing cable’ that can be used for offshore plant business and undersea exploration

“Underwater towing cables” are being applied to military SONAR systems to detect enemy ships and submarines. However, technology such as this submarine cable could also be used for civil applications. What fields are there?



Representatively, this technology can be applied to the manufacture of submarine exploration robots such as unmanned underwater vehicles (ROV) or Crabster (CR 200).

The submarine exploration robot was developed for the purpose of discovering and collecting useful resources, living things, and underwater relics in the deep sea, or for disaster relief activities such as sunken ships. The ‘umbilical cable’ is a device that supplies power to the submarine rover and transmits communication and information to control it remotely. The technology applied to this umbilical cable is the ‘underwater towing cable’ technology.

Thanks to the cable technology that can withstand extreme underwater environments, the submarine exploration robot can stably conduct activities including submarine exploration and disaster relief even in adverse conditions such as high water pressure and irregular currents in the sea.

So far, we have looked at the ‘underwater towing cable’ developed through dual use technical cooperation.

By succeeding in developing such a high-level technology, KIMS UBQ is very proud of its contribution to the national economy by promoting the localization of the Korean defense industry. KIMS UBQ looks forward to the day when the 'underwater towing cable' technology will be actively used in the private sector and KIMS UBQ will be recognized worldwide.

## – Spin Up – ## Development of an underwater towing cable ##

Company name: KIMS UBQ Co., Ltd.

Project name: Development of an underwater towing cable (2014–2017)

Person in charge: CEO Kim Tae-yeop



### Cable, it drives marine exploration

Human beings, as creatures, cannot properly know the Creator who made all things in the universe. That is why the Creator's heart is often compared to the sea, because the depth of the sea is so deep and wide that human beings cannot reach the end. Nevertheless, people want to know the sea. It is impossible for humans to know 100% of the depths of the sea, but the sea beckons the world with its infinity and depth of mystery, creating a sense of mystery. For this reason, the sea has been with us since ancient times and has been regarded as a space of possibility, an unknown world, in the name of nature.

The sea was another source of life, a lifeline, and a barrier. Historically, the sea has been a subject of conquest, but the infinite space in the sea has reminded us of the dwarfism of humans. Therefore, humans want to know the sea. We call it exploration, and we are still getting to know the sea.

### # The lifeline of the SONAR system

It is impossible to know the world under the sea in detail. Thus, it is absurd to say that people who live on land know what is in the water. As a result, he became interested in detecting and exploring the sea through sound. Just as a doctor distinguishes sounds through a stethoscope when looking into a patient's body, the sound of the sea is heard through a device called SONAR (Sound Navigation And Ranging). SONAR is an acoustic detection device that detects objects in the sea through sound waves. Since the sea is too dark to observe with real eyes, it is effective to detect and defend obstacles through SONAR, which has less energy loss underwater and can detect long distances. SONAR is a very important defense-related technology because it is usefully used to detect and defend enemy ships or submarines in the defense field. However, this is a technology that is actively used not only in national defense but also in maritime exploration, and is applied simultaneously to the civil and military domains. Although SONAR-related technology is growing gradually, it was also true that the growth rate was slow due to the high dependence on imports for parts. There was good news about this.

An underwater towing cable that can move while maintaining a stable SONAR system in an extreme underwater environment has been developed by a Korean company.

This media met with Kim Tae-yeop, CEO of KIMS UBQ, which was in charge of this project, which was conducted as a civilian-military technology development project.

“The SONAR system will have the ability to detect, track, and analyze by using the noise of threat forces such as surface ships and submarine mines. At this point, the cable is the key component that holds the SONAR system together. It is the cable that connects land and sea. The SONAR is configured to collect and transmit acoustic information from the vessel by suspending the sensor at the end of a cable assembly from the vessel.

Since the water pressure in the sea is very high, the cables that make up the SONAR system must have high tensile strength. Therefore, high-quality cables are one of the key components in the SONAR system.”

SONAR is widely used not only in the military but also in the civilian world. As land resources are depleted around the world, ocean exploration for the development of marine resources is being carried out on a large scale. Therefore, as marine exploration equipment also occupies an important portion, the demand for equipment exclusively for marine resource exploration is increasing, and the technology of related components has become more important. For marine exploration equipment such as side scan SONAR and ROV, it is operated with an umbilical cable, an underwater towing cable, and a buoy cable, which are used in the military as well as the civilian realm.

SONAR is an important munitions item mounted on warships and helicopters conducting anti-submarine search activities. In particular, various underwater acoustic detection systems used for military purposes require equipment to drop and salvage acoustic detection sensors and an underwater towing cable.

“The problem is the technology for cables. Korea did not have the technology for towing cables that could move underwater, so it was highly dependent on overseas products.

Since all the cables constituting SONAR are imported, the SONAR system becomes useless if imports are not made in time in a situation where the cable has to be repurchased due to a problem.

Without a connecting cable, no matter how good the system is, it cannot be used at sea.

The cables for the SONAR system are not only used for simple maritime exploration, but also for military security. In particular, in a situation where South Korea is under various military threats, if the situation at sea is not detected and searched in time, this can lead to a serious security threat.

Until now, all of the expensive military and civilian cables depend on imports, and in particular, military underwater towing cables require export permission from the US State Department, so there are many difficulties in supply and demand.

In the face of these problems, KIMS UBQ, together with the Defense Science Research Institute, promoted the development of an underwater towing cable as part of civil-military technical cooperation, and was able to localize it.”



## # KIMS UBQ in Korea, Succeeded in localization of underwater cables

KIMS UBQ Co., Ltd. was established in 2005. KIMS UBQ has designed and manufactured cables required for SONAR system, magnetic field system, and electric field system with optimal engineering in response to the needs of the times. KIMS UBQ was established for the localization of the following equipment: First, the localization of NAIMS (Naval Acoustic Information Management System), an acoustic information management system that can collect, analyze, manage, and disseminate acoustic information essential for anti-submarine operations; Second, localization of Acoustic Intelligence, an underwater acoustic information collection system that collects information obtained from underwater detectors and floating detectors on the sea.

KIMS UBQ is a company with a vision to localize the sound information system. KIMS UBQ, which has been steadily participating in cable development projects since 2006 and secured technological prowess, participated in the Naval Acoustic Information Management System (NAIMS) project hosted by Hanwha Corporation and ADD. Through this, KIMS UBQ developed a submarine photoelectric composite cable and sensor cable. In 2008, KIMS UBQ participated in the Ulleungdo project hosted by the Korea Meteorological Administration and developed a submarine optical/electric composite cable for an earthquake and tsunami monitoring system. KIMS UBQ, a small and medium-sized company specializing in cable manufacturing, was selected as a company supporting the manufacturing technology of 'Uz Erae Cable Automotive Wire Plant' in Navoi City, Uzbekistan, and achieved an export performance of 6 million dollars.

“The Cheonan incident in 2010 brought about a change in the Korean maritime surveillance system. In Korea's maritime and military security environment, the need for a more competitive maritime surveillance system has emerged. Against this background, KIMS UBQ succeeded in establishing fixed mass production facilities and developing technology for mass production of submarine cables. KIMS UBQ has accumulated technology and know-how through the development of submarine photoelectric complex signal transmission cables used in the relevant field. Based on this technology, KIMS UBQ has been able to participate in the localization of cables, a key component of the SONAR system.”

KIMS UBQ recognized core design technology, material technology, mass production technology, and evaluation technology suitable for the underwater environment. KIMS UBQ has developed submarine photoelectric composite cables and sensor cables. After the Cheonan incident, KIMS UBQ was evaluated as a successful national R&D project by supplying cables to major port monitoring systems. KIMS UBQ was selected as the host organization for the 'Underwater Towing Cable Development' project announced by the Civil-Military Cooperation Promotion Agency in 2014. KIMS UBQ also incorporated Woobang Cable Co., Ltd. as a subsidiary, and prepared a foothold for a leap forward by equipping it with a mass production system.

KIMS UBQ succeeded in developing an underwater towing cable with domestic technology through the civil-military combined technology development process for the next three years.

The evaluation of umbilical cables and buoy cables, including the underwater towing cables developed by the organization in charge of KIMS UBQ, exceeded expectations. This is because KIMS UBQ products are evaluated to be at an equivalent level or higher compared to products in developed countries such as South Bay in the US and DeRegt in Europe, which are standard in the same industry. These achievements can be said to be due to the will of Koreans to develop Korea from a technology master country to a source technology country. It is also the result of combining the earnest wishes of the Korean people and military with the determination of KIMS UBQ to pursue the best technology.

## # Leaping from a technologically underdeveloped country to an advanced country in underwater cable market

The localized underwater towing cable consists of a cable that supplies power and a cable that transmits data and enables communication. The key to determining the technological prowess of a cable is to withstand extreme seabed conditions well. Fortunately, the underwater towing cable made by KIMS UBQ has withstood the extreme conditions brilliantly. The results could be achieved since it was supported by high-level technology that could withstand a water depth of 6,000 meters and a pressure of 138 bar, and had a tensile strength of 50 tons. Another problem was also solved. The problem was cable kinking when moving the SONAR system reliably under water. However, KIMS UBQ was equipped with the technology to move stably without twisting even in the water while carrying out the development project. This was possible because civil-military technical cooperation, in which the military and civilians jointly develop technology, exerted a synergistic effect.

“Underwater towing cables require technology to prevent kink and birdcage during use, maintain smoothness (torsion balance), and maintain high tensile strength. In particular, since the twist of a towed cable depends on the forming rate of the outer tension wire, a technology that minimizes the torsional stress remaining in the cable is required to maintain the smoothness of the cable.

While we were working on this project, resolving these issues was the biggest key and the task we had to solve.”

The research team, including CEO Kim Tae-yeop, searched for a solution based on their experience and know-how, as well as outside help and advice. In order to minimize torsional stress, pre-forming and post-forming technology of the external tension wire was secured, and a Stainless Steel Loose Tube (SSLT) type was applied. KIMS UBQ has improved the optical cable communication line structure so that optical fiber can be applied stably in practice. In addition, KIMS UBQ has improved the power line structure of the power line by using a fluorinated ethylene propylene material with excellent abrasion resistance, water resistance, and fire resistance, replacing Polypropylene, which has been used as the material for the power line of the foreign capital supply cable.

CEO Kim explained the difficulties and achievements of the cable development process as follows.

“We had to take these things into account, so we had to go through a lot of trial and error from design to testing. Besides, there were also difficulties in developing skills and test evaluations to verify development skills. However, during this process, the advice and cooperation of expert members of the Civil-Military Cooperation Promotion Agency and various researchers of ADD were of great help. With the help of these people and our efforts, through numerous designs and startups, we were able to secure the original technology for the cable manufacturing method. Korea used to be the dominant country in the submarine cable market, but now it has become a country that has secured the original technology. We are proud that we have developed a technology that contributes to Korea’s growth.”

## # Spectacular transformation of towing cables

KIMS UBQ has secured everything from material technology to design, manufacturing and connector technology through the process of localizing the underwater towing cable. KIMS UBQ has been taking the lead in the localization of cables, such as the completion of the task in 2017 and the development of the underwater towing cable manufacturing technology in 2018 and receiving the NET (New Excellent Technology) certification from the Ministry of Oceans and Fisheries. KIMS UBQ has since participated in the development of the next Korean destroyer, generating approximately KRW 3 billion in sales, and contributed to the production of tug cables used in frigates of the Korean Navy. Commercialization of submarine cables to be used in the private sector is currently in its infancy and there is not much demand for it, but KIMS UBQ is cooperating with KIOST (Korea Institute of Ocean Science and Technology), KRISO (Ship and Offshore Plant Research Institute), and submarine cleaning robot companies in many areas. KIMS UBQ is working closely with them to develop a Korean-style cable system, and is making efforts in various ways so that its products can be used in both civilian and military use.

“Underwater towing cables are being used in military SONAR systems to detect enemy ships and submarines. However, since it is a dual use combined technology, it can be widely used in the civilian sector as well.

As mentioned earlier in the ocean exploration story, the umbilical cable to which the underwater towing cable technology is applied can be applied to an unmanned underwater vehicle (ROV) or a submarine exploration robot such as the Crabster (CR200). The submarine rover was developed for the purpose of discovering and collecting useful resources and living underwater relics in the deep sea, and for disaster relief activities such as sunken ships. An umbilical cable is a device that supplies power to an underwater robot and transmits communication and information to control it remotely. As such, the marine cable developed by us can be used freely for civil and military use, suggesting the possibility of localizing the development of other parts as well as cables. CEO Kim Tae-yeop puts significance on the fact that this localization of the underwater towing cable allowed us to take a step forward as a country with original technology, and is currently planning to promote this technology to the world.

According to his explanation, he applied to participate in the export weapon system modification and development support project to export the towed cable made by KIMS UBQ to Turkey. In addition, KIMS UBQ is scheduled to receive support for promotion and cooperation through Korean government channels located abroad. In this way, in the field of tug cables, the Korean dual use cooperate to promote the technology of KIMS UBQ to the world and focus on selling it. Furthermore, it is expected to lead to earnings as it has completed examination and company registration for compromise trade not only with Turkey but also with US defense companies.

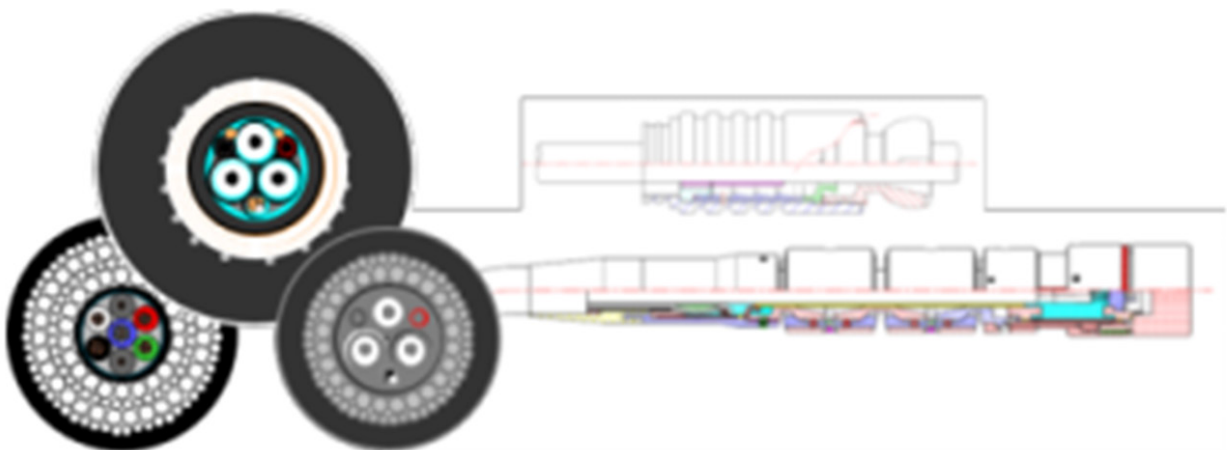
“The underwater towing cable development technology is significant in that it has a greater future potential. This technology has high utility in military technology in that it can be extended to not only destroyer frigates but also submarine Lynx helicopters. In addition, this technology can be applied to

the civil sector as well as the marine exploration and offshore plant sector, so the demand for it will increase rapidly. Technology achieved through dual use cooperation and technology cooperation exerts synergy in various fields.

In that sense, the value of dual use cooperation and technical cooperation is great. With respect to the development of these technologies, one side leads the other side and develops together in a form of win-win. In particular, this kind of cooperation has the advantage of making it easier to enter the relevant market if reliability is certified by either side of the public-private partnership. Of course, core source technology development and application development capabilities are the most important. In addition, it is necessary to understand the development trend of advanced technology and maintain a good cooperative relationship with customers. If these conditions and security are well maintained and managed, it is expected to achieve great results in the future based on the localization of towing cables.”

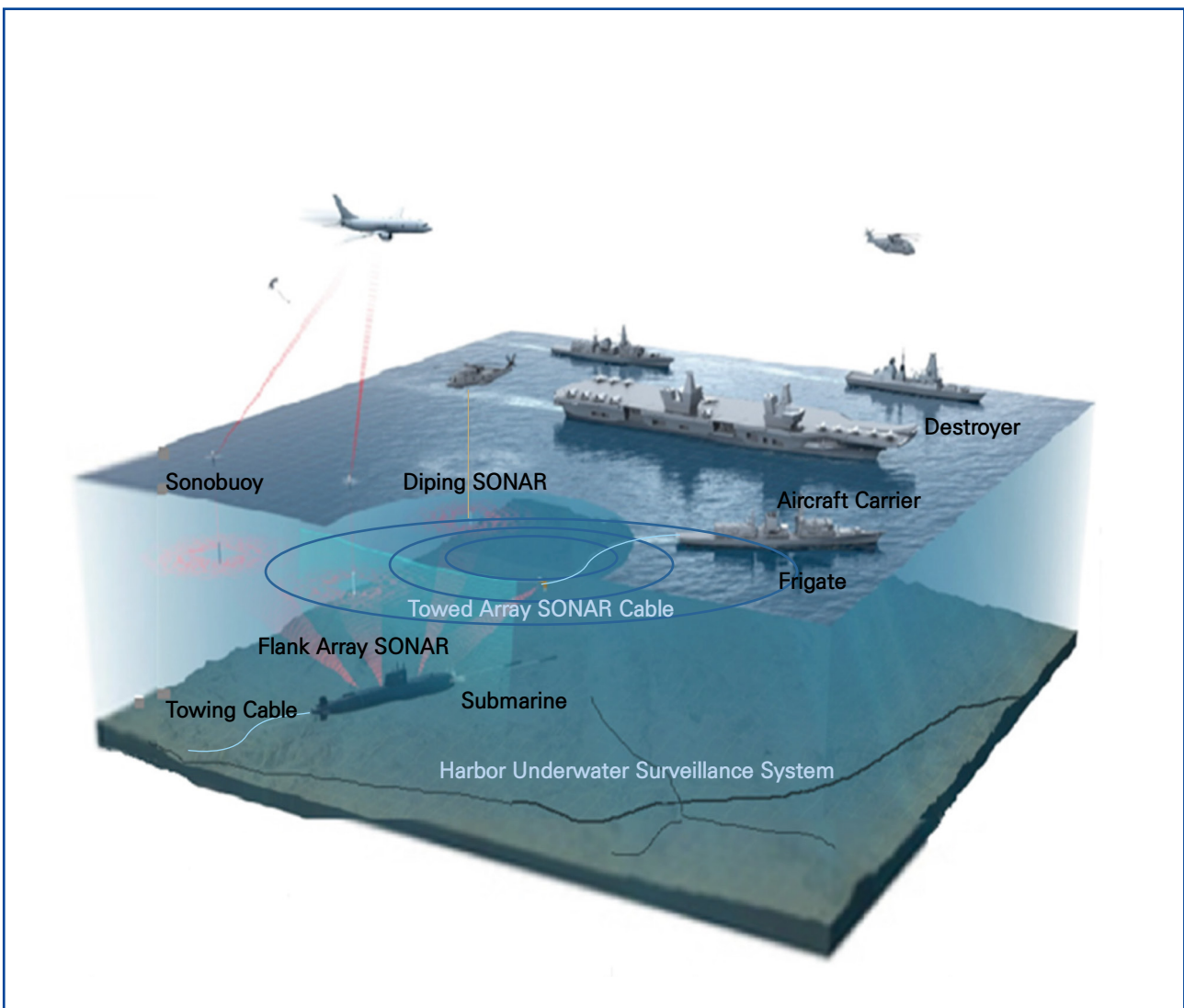
In fact, KIMS UBQ is growing with the localization of the underwater towing cable. KIMS UBQ is receiving technical cooperation proposals from countries around the world, and technology development and research projects are actively underway to utilize various underwater maneuvering tow cables for civilian use. Accordingly, it will be possible to respond to the demand related to the development of advanced marine equipment such as deep-sea unmanned submersibles and underwater construction robots, which are currently actively underway. As the core parts localization development support project is completed in 2019, it is also expected to receive orders for waiting orders from the government and to carry out additional development tasks from the government and research institutes.

KIMS UBQ has localized and built a mass production system for an underwater towing cable that serves as a blood vessel and nerve for marine exploration. Amid the ever-changing technological competition with marine equipment that is becoming more advanced day by day, KIMS UBQ is expected to continue to supply blood vessels that reliably protect the Korean sea with high technology and differentiated competitiveness.





# Cabling Solutions for Industrial Applications



### Towing Cable Assembly

#### TASS



Optic/Electric Hybrid  
Light Weight Cable



Optical/Electric  
Hybrid - Heavy  
& Light Weight  
Cable Connector



Optic/Electric Hybrid  
Heavy Weight Cable



Light Weight Cable

#### TACM



Heavy & Light  
Weight Cable  
Connector



Heavy Weight Cable

### Buoy Type Submarine Cable Assembly



Buoy Sensor  
Umbilical Cable



Buoy Backbone  
Umbilical Cable

### Harbor Underwater Surveillance System



Trunk Cable



Optical Backbone Cable



Sensor Cable



**KIMS UBQ**



New Excellent Technology

**신기술인증**

New Maritime and Fisheries Technology No. 2017 - 08  
Underwater towing cable

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