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**Submarine Escape  
and  
Rescue**





## Introduction To Exercise Bold Monarch 2011

Exercise Bold Monarch 2011 is the world's largest submarine escape and rescue exercise. This year's event is the eighth in a series of triennial NATO sponsored Submarine Escape and Rescue (SMER) Exercises, involving submarines, ships and aircraft from NATO and non-NATO countries. It is being conducted in the Mediterranean Sea, off the coast of the Host Nation, Spain from 30 May - 10 June 2011. Approximately 2000 participants will attend from over 20 nations. Among many notable advances in international cooperation to be seen in this exercise, this will be the first time a Russian submarine has participated in any NATO exercise.

BOLD MONARCH is an exercise designed to maximise international cooperation and interoperability in an area of maritime safety that has always been very important to NATO and all submarine-operating nations. Following the tragic loss of a submarine in 2000, even more international attention has been focused on this safety mission. The exercise is designed to practice international submarine escape and rescue equipment and procedures but more importantly the multi-national command and control of all rescue assets. In this exercise rescue system operations will be conducted by non-NATO countries like Russia, Sweden and Israel, and observed by representatives of countries around the world, including; Argentina, Australia, Brazil, India, Republic of South Korea, Vietnam and Ecuador, to name a few. During the 12 days of the exercise submarines from Portugal, Russia, Spain and Turkey will be bottomed in carefully chosen and surveyed areas. Rescue forces, with a range of sophisticated debris clearance, diver assisted equipment and submarine rescue vehicles from Italy, the United States of America, Russia, Sweden and the jointly owned system of France, Norway and UK, will engage in a serialized programme to rescue the bottomed submariners. Specialist divers and hyperbaric medical teams from France, Greece, Italy, the Netherlands, Spain, Sweden, the United Kingdom and others will work from support ships on complex medical problems in demanding scenarios. Air units will deploy from Italy, United Kingdom and United States of America to assist in locating a simulated distressed submarine and to deploy parachutists to provide first reaction assistance to the stricken submariners.

Exercise Bold Monarch 2011 will culminate with a 48 hour, large scale coordinated rescue and evacuation of 150 survivors, including many simulated casualties, from a disabled submarine on the bottom. Emphasis will be placed on the command and control of such an incident under the internationally agreed, NATO document ATP 57, procedures. The compatibility between rescue assets, standardization of procedures and coordination and cooperation between ALL national elements, both military and civilian, will be demonstrated in Bold Monarch 2011. With over 40 nations operating submarines worldwide, interest in this exercise is expected to extend to the entire global submarine community including the People's Republic of China, Japan, Pakistan, Chile, Peru, and many others.



## Visitors Reception Area (VRA)

The Visitors Reception Area (VRA) will be located ashore, near San Pedro Del Pinatar on the south pier, San Las Salinas. Here, official visitors and registered media personnel that arrive after the Command Ship ESPS GALICIA has sailed on Monday 30 May can register and be taken out to sea on a short transfer to observe the exercise. Any visitors are reminded to bring appropriate clothing/military uniform for the time of year and for going to sea in confined, hot and wet places. Military dress is seagoing summer uniforms.

### EXERCISE SCHEDULE

|                 |   |
|-----------------|---|
| 28 May          | PreSail Conference (in port Cartagena).       |
| 29 May          | Rescue Element Symposium (in port Cartagena). |
| 30 May          | Search Day. All units proceed to sea.         |
| 31 May - 3 June | Basic Rescue Phase.                           |
| 4 - 5 June      | MASSIVEX Advance Scenario.                    |
| 6 - 7 June      | Preparation and Media Day.                    |
| 8 June          | DV Day.                                       |
| 9 June          | At Sea Conclusion. All units return to port.  |
| 10 June         | Hot Wash Up (in port Cartagena).              |

## Media Event Overview

Submarine rescue requires highly specialised, technically advanced and expensive equipment. Only a small number of nations have the resources and capability to operate such systems. The capacity and limitations of these systems are quite varied, making this opportunity to verify their interoperability with actual submarines at sea even more important. Over the past ten years the optimising of these assets and ensuring compatibility and interoperability between rescue systems has become a global success as the boundaries of possible rescue scenarios have been pushed back further and further. Most submarines have emergency life support stores that will last the crew about five days. Some rescue systems (including the US and NATO rescue systems participating in BOLD MONARCH) have been designed to be air portable so that they can be air transportable at short notice anywhere in the world. Most submarines around the world have been designed with rescue seats to a NATO standard that are capable of mating with similarly NATO standardised rescue vehicles. In the event of a submarine accident that traps a submarine crew in a bottomed disabled submarine (DISSUB), the world's rescue assets would be mobilized and deployed to the area of the accident as quickly as possible. The coordination and operation of this rescue operation is what we are practicing in BOLD MONARCH.

## Media Events

A press conference will be held on board the Spanish Command Ship ESPS Galicia at 1600 on Saturday, 28 May in Cartagena harbour. On Tuesday 7 June 2011 accredited members of the press will have the opportunity to embark on board ESPS GALICIA and then embark in smaller boats to view the escape and rescue procedures being conducted at sea with different systems. A limited number of places will also be available for media representatives to view the exercise from one of the submersibles. Press identification cards will be issued at the Visitors' Reception Area (VRA) at San Pedro del Pinatar. Media with particular specialist interests or requirements are asked to make their needs known to media officer Lt Cdr Andrew Mills, Royal Navy at [andrew@nephria.co.uk](mailto:andrew@nephria.co.uk) no later than Friday 27 May 2011 so that facilities can be specifically arranged. The Allied Press Information Centre (APIC) will be established on board ESPS GALICIA from 27 May - 10 June 2011.

# Exercise BMH11 Chain of Command



## Commander, Maritime Command, Northwood

Admiral Sir Trevor Soar KCB OBE, Royal Navy. As a NATO Commander Sir Trevor Soar is the maritime advisor to NATO's Joint Force Commander, Brunssum and is tasked to ensure NATO's maritime forces are ready to engage in joint and combined operations as required by the North Atlantic Council. He is also directly responsible for elements of the standing NATO Response Forces.

“As a submarine trained officer myself, I wholeheartedly support the requirement to train and exercise submarine rescue with all submarines from across the NATO spectrum and wider. This exercise gets my full support and complete endorsement.

Admiral Sir Trevor Soar



## Commander Submarines North (COMSUBNORTH)

RAdm Ian Corder is NATO's commander for allied submarine operations in the North Atlantic region. He is responsible for coordinating submarine operations of NATO nations in waters from the west coast of Africa to the Arctic Ocean, ensuring submarine safety and operational efficiency. He is one of three NATO submarine operating authorities, ready to exercise command and control of assigned submarines at the direction of NATO.

“Bold Monarch 2011 intends to demonstrate the overall commitment of the world's submarine operating nations to the task of submarine rescue. With more than twenty of the world's submarine operating nations participating in, or observing, this exercise BMH11 offers an unprecedented opportunity to prove that world wide efforts to ensure compatibility to a common standard are constantly improving. This task could not have been achieved without the international breadth and political goodwill that are fundamental to submarine rescue; allowing a bridging of traditional international divides in support of the world's submariners, should the need ever arise.”

Rear Admiral Ian Corder



## Deputy Commander Submarines North (COMSUBNORTH)

Captain David Dittmer US Navy directs the staff of COMSUBNORTH in pursuit of Admiral Corder's operational mission. His staff contains submarine officers from all NATO nations operating submarines in the Atlantic. Captain Dittmer is a served commanding officer of a US ballistic missile submarine, and brings 28 years of operational experience to his post. He is the Officer in Tactical Command of exercise BOLD MONARCH 11, coordinating submarine escape and rescue operations from the command ship during the full exercise period. He served in this same role for exercise BOLD MONARCH 2008 off Norway.

"In BOLD MONARCH 2008 NATO and our partner nations demonstrated dramatic improvements in international cooperation and interoperability in this challenging field. Our achievements included the first ever rescues between the Russian Federation Navy and NATO submarines and the first transfer of personnel with the new US and NATO rescue systems. In 2011's exercise we will move even further in demonstrating our technical capabilities and coordination processes. We will include a Russian submarine in this exercise for the first time and practice complex, international command and control procedures in a realistic scenario. This is the graduate level of submarine rescue operations."

Captain David Dittmer US Navy



# Participating Submarines



## Spain SSK Galerna

Representing the Host Nation the Spanish submarine Galerna will be central to the whole exercise interest. The Spanish navy have four locally built Agosta-class boats, namely the Galerna, Siroco, Mistral and Tramontana all based in Cartagena.



## Russia SSK Alrosa

Alrosa is a submarine of the Black Sea fleet, Russian Federation. The submarine has been created on an experimental Project, 877V (a diesel-electric submarine with a pump jet propulsion). Today this submarine is a part of the 247th Division of submarines of the Black Sea Fleet. This is the first Russian Submarine to participate in a NATO exercise.



## Portugal SSK Tridente

The Tridente class, also designated as U 209PN, is a new diesel-electric submarine class based on the Type 214 submarine developed by Howaldtswerke-Deutsche Werft GmbH (HDW) for the Portuguese Navy.



## Turkey SSK Anafartalar

The Turkish Navy has 14 non-nuclear German-designed Type 209 submarines. At present the Turkish Navy operates the largest fleet of German-designed submarines in the world.

# Participating Ships



## Galicia L51 - Spain

Galicia (L-51) is a Galicia class Landing Platform Dock (LPD) of the Spanish Navy, launched in 1998. She is the lead ship in her class. Galicia will be the Command Ship and nerve centre of the whole exercise.

Displacement: 13,000 tonnes



## Neptuno A20 - Spain

Neptuno A20 Spanish Submarine rescue ship. A former oilfield tug configured as a submarine rescue ship in 1988.

Displacement 1,860 tonnes full load.



## Clara Campoamor - Spain

Clara Campoamor is a Spanish search and rescue ship. Commissioned in 2007.

Displacement: 3,050 tonnes.



## ITS Anteo (A 5309) - Italy

Submarine Rescue and Salvage Ship. Anteo will operate her Submarine Rescue Vehicle SRV300, Submarine Rescue Chamber (SRC), Remotely Operated Vehicles (ROV's) and Divers throughout the exercise.

Displacement: 3,500 tonnes.



## TCG Inebolu (A-590) - Turkey

Powhatan - class fleet ocean tug commissioned into the Turkish Navy in 2008 as a diving support ship.

Displacement: 2,032 tonnes.



## KL Sandefjord - Norway

Anchor Handling Tug Supply Vessel delivered in January 2011. Sandefjord will be taken from trade to support the NATO Submarine Rescue System (NSRS)  
Displacement 4,800 tonnes.



## HSwMS Belos A214 - Sweden

Submarine rescue ship. Acquired in 1992. Although capable of independent SM rescue operations Belos will conduct coordinated operations with NSRS in BMH11.  
Displacement 6,150 tonnes.



## Pourquoi Pas - France

French research vessel. Launched in 2004 it was designed for hydrography, geoscience and physical, chemical and biological oceanography, as well as to launch small submarines such as the manned submersible Nautile and the ROV Victor 6000.  
Displacement 6,600 tonnes.



## EPRON Prut-Class - Russia

EPRON will operate the Russian Black Sea Fleet submarine rescue facility. As a result of upgrades including sonar and underwater communications the ship was Renamed 'EPRON' in 1989. She is capable of decompression of up to 48 people in 4 interconnected chambers. In 2005, the vessel was installed with compact "Tiger" Remotely Operated Vehicles, ROVs.  
Displacement 3,090 tonnes



## KIL-158 - Russia

Russian heavy lifting ship that has been in the Black Sea Fleet since 1989. KIL-158 is designed for lifting and placing roadstead equipment, attaching and detaching floating docks and also for transporting a wide range of cargoes. Will be used to assist Epron in BMH11.  
Displacement 5,250 tonnes



## **Shakhter - Salvage Ship - Russia**

Commissioned 1985 and took part in the 2005 version of BMH11 exercise off Italy, with combat divers aboard.  
Displacement: 2,170 tonnes.



## **HOS Shooting Star - USA**

Multipurpose Support Ship. Commissioned 2008. Taken up from trade to support the USA SRDRS system during BMH11.  
Displacement 2205 tonnes.

## **International Submarine Escape And Rescue Liaison Office (ISMERLO)**

ISMERLO is the only coordinating organization for submarine escape and rescue matters in the world. It was established almost 10 years ago in Norfolk, Virginia, USA. Their international staff currently consists of experts from the USA, France, Norway and Italy led by Commander Bill Orr USN (retd). It is the international co-ordinating authority for submarine rescue procedure, systems, equipment and support ships. ISMERLO ensures that at least one of the world's rescue systems is available to be deployed at immediate notice in the event of an actual submarine casualty.

ISMERLO's expertise and web-based capabilities will be used extensively throughout BMH11 to coordinate exercise events as would be done in a real world event. During the 48 hours advanced coordinated rescue event on 4 – 5 June, ISMERLO's capabilities will be critical to the realism of the command and control scenario.

# Participating Rescue Systems

## NSRS - NATO Submarine Rescue System



NSRS is a jointly owned French, Norwegian and British system which consists of; an intervention system provided by a Remotely Operated Vessel (ROV), a Rescue System provided by a free swimming Submarine Rescue Vehicle (SRV), a launch and recovery system and a Transfer Under Pressure system (TUP); capable of decompressing up to 70 rescuees simultaneously. The intervention system can arrive on the scene ahead of the rescue vehicle to conduct an initial survey and prepare the DISSUB for rescue by conducting debris clearance as required. The ROV can also provide additional stores (life support, medical etc.....) by POD posting. The rescue system is capable of operating to a depth of 610 m and can transfer up to 12 - 15 rescuees per cycle. Both the intervention and rescue systems are autonomous; they do not require any services from the mother ship. The complete system has been designed to be air transportable from its base at Faslane, Scotland.

## Russian Federation Navy (Black Sea Fleet) Rescue Chamber



The RFN Black Sea Fleet Submarine Rescue Chamber is housed on the general purpose rescue ship 'EPRON'. The EPRON is equipped with four 'bells/chambers': the Rescue Bell (CK-64) capable of rescue to 500m, a Diving Bell (BK) capable of operating to 200m, a working chamber (PK-680) capable of 450m depths and an observer chamber with camera (HK-680) operable to 300m. The original Russian Navy diving and salvage bells were only designed for operations to depths of just 200m. With the increased diving depths of submarines developed in recent decades there was a need to create a modified rescue ship, project 527M 'EPRON', capable of working with rescue chambers to 500m that became serviceable in 1989. BOLD MONARCH 2011 is the first time this system has worked with non-Russian submarines.

## US SRDRS - The Submarine Rescue Diving and Recompression System



The US Navy's SRDRS is operated out of San Diego, California. It conducted its first operational matings during BOLD MONARCH 2008, and has since also exercised with several submarines of South American navies. It consists of four distinct elements, which include the Assessment/Underwater Work System (AUWS); Submarine Decompression System (SDS); the Pressurized Rescue Module System (PRMS); and PRMS Mission Support Equipment, including the Launch and Recovery System (LARS), a deck mounted A-frame crane used to launch and recover the PRM. The SDS, PRM, LARS, and associated generators and auxiliaries all compose the Submarine Rescue System (SRS). The Submarine Rescue Diving and Recompression System (SRDRS) consists of the Submarine Rescue System (SRS) in conjunction with the Assessment/Underwater Work System (AUWS). These systems are designed to rapidly deploy to any location in the world via air and ground transportation and will be installed on a military or commercial Vessel Of Opportunity (VOO). The SRS, approximately 183 tons, is installed aboard the VOO.

## Italian Submarine Rescue Vehicle - SRV300



Based in Taranto, Italy the SRV300 is housed onboard ITS ANTEO, a purpose built rescue support ship, that is rescue ready and is proven reliable after multiple exercises. It can rescue crew members from a pressurised DISSUB; operate in sea states up to SS3 and can rescue up to 12 personnel at a time. It can mate down to a depth of 300m at a maximum seat angle of 45 degrees. It is a free swimming, piloted rescue vehicle that is supported by the rest of the integrated system onboard ITS ANTEO. The full system includes a Submarine Rescue Chamber (SRC) capable of rescuing up to 6 people at a time and ADS divers that can operate down to depths of 300m to support the submarine before a rescue is attempted. The whole system is then augmented by an embarked Transfer Under Pressure capability that will be able to decompress a whole Italian submarine crew.

# Medical Support

The medical problems associated with rescuing the crew of a distressed submarine are critical and complex. People may be injured by physical impact, by fire or by breathing toxic gases. Cold water may also cause hypothermia and rapid changes in pressure could cause decompression illness (DCI). If the submarine's atmosphere support systems are out of service the build up of carbon dioxide will cause a toxic atmosphere and impaired hygiene may cause gastroenteritis. In a deteriorating situation people could very quickly become severely incapacitated. The most challenging scenario in a submarine accident is when submariners are trapped in a submarine unable to surface with a toxic atmosphere and rising pressures. This is a crisis situation that calls for a high degree of professional expertise and close co-operation between operators and specialist medical personnel. There are two ways of exiting a bottomed distressed submarine. If the situation is dangerous or uncontrollable, the first option for the crew is escape. If the submarine is not too deep, escapees will evacuate the submarine via the escape locks and be recovered to safety on the surface. The second is by means of rescue. If the crew can wait for a submarine rescue vehicle or submarine rescue chamber to come to their aid this is usually the safer and preferred option. Reaching a distressed submarine and transferring injured personnel, possibly under pressure, into a rescue vehicle, then bringing them to the surface is a most complex procedure with many specific medical challenges. These challenges include the risk of DCI. Most nations operating submarines have highly trained medical teams to deal with these specialist challenges.



# SPAG

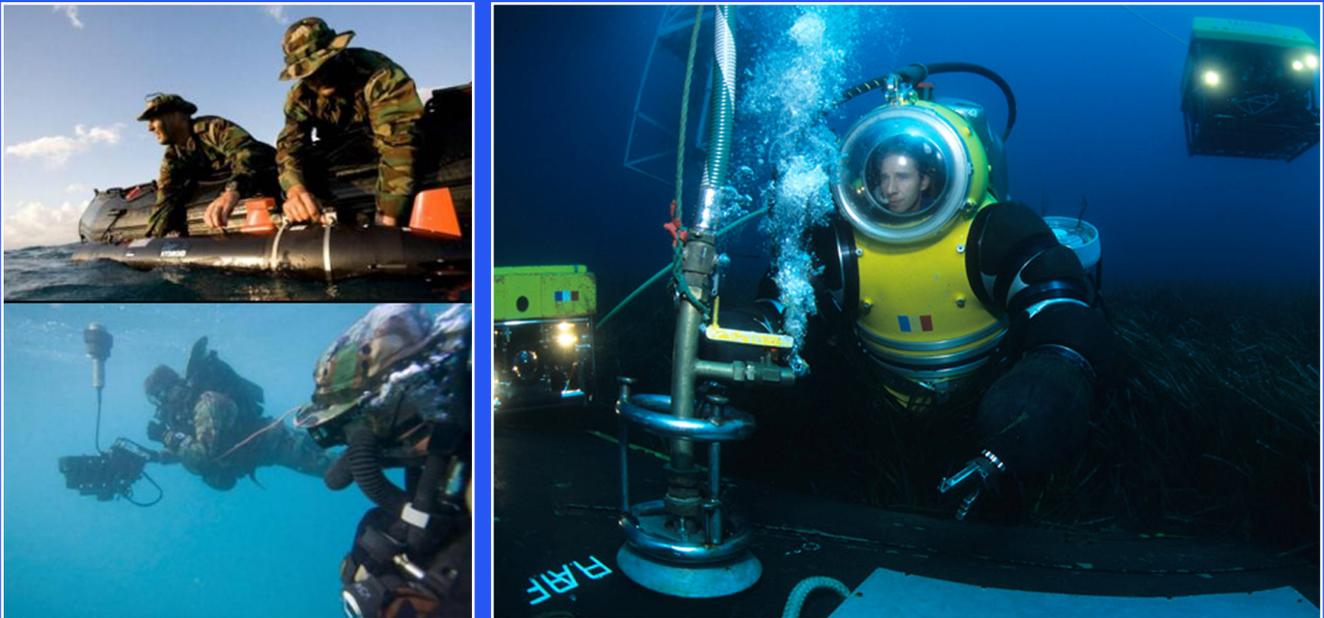


A typical Submarine Parachute Assistance Group (SPAG) is available at six hours notice to take off. They are highly trained in water descent parachuting. Once in the sea, their primary role is to establish communications with the Distressed Submarine (DISSUB) and relay information back to headquarters for rescue planning. If an escape is planned due to conditions inside the DISSUB or an escape is already in progress they are trained to provide First Aid and other assistance to survivors and place them in life rafts to extend their survival time until a recovery asset arrives on scene.



# DIVERS

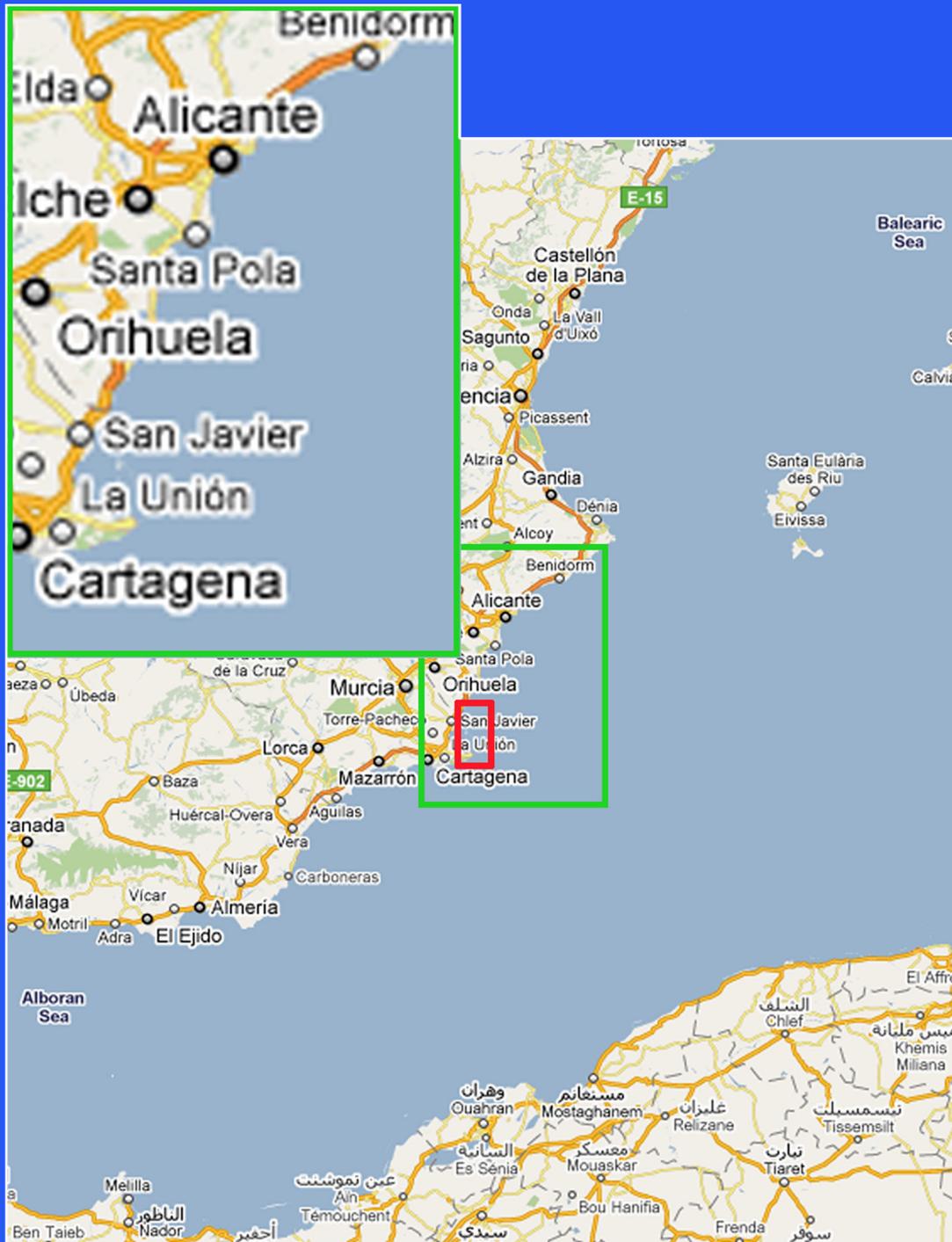
Divers also play a vital role in submarine escape and rescue and representatives from many nations have come to BOLD MONARCH to practice their skills in an integrated rescue operation. Free swimming divers can descend to a shallow submarine and inspect the hull, clear access to the escape hatch and attach supply lines to deliver fresh air to the crew or high pressure air to attempt to bring the submarine to the surface. In addition they can deliver water-tight pods containing food, medical supplies or atmosphere control chemicals to keep the crew alive until they are rescued.



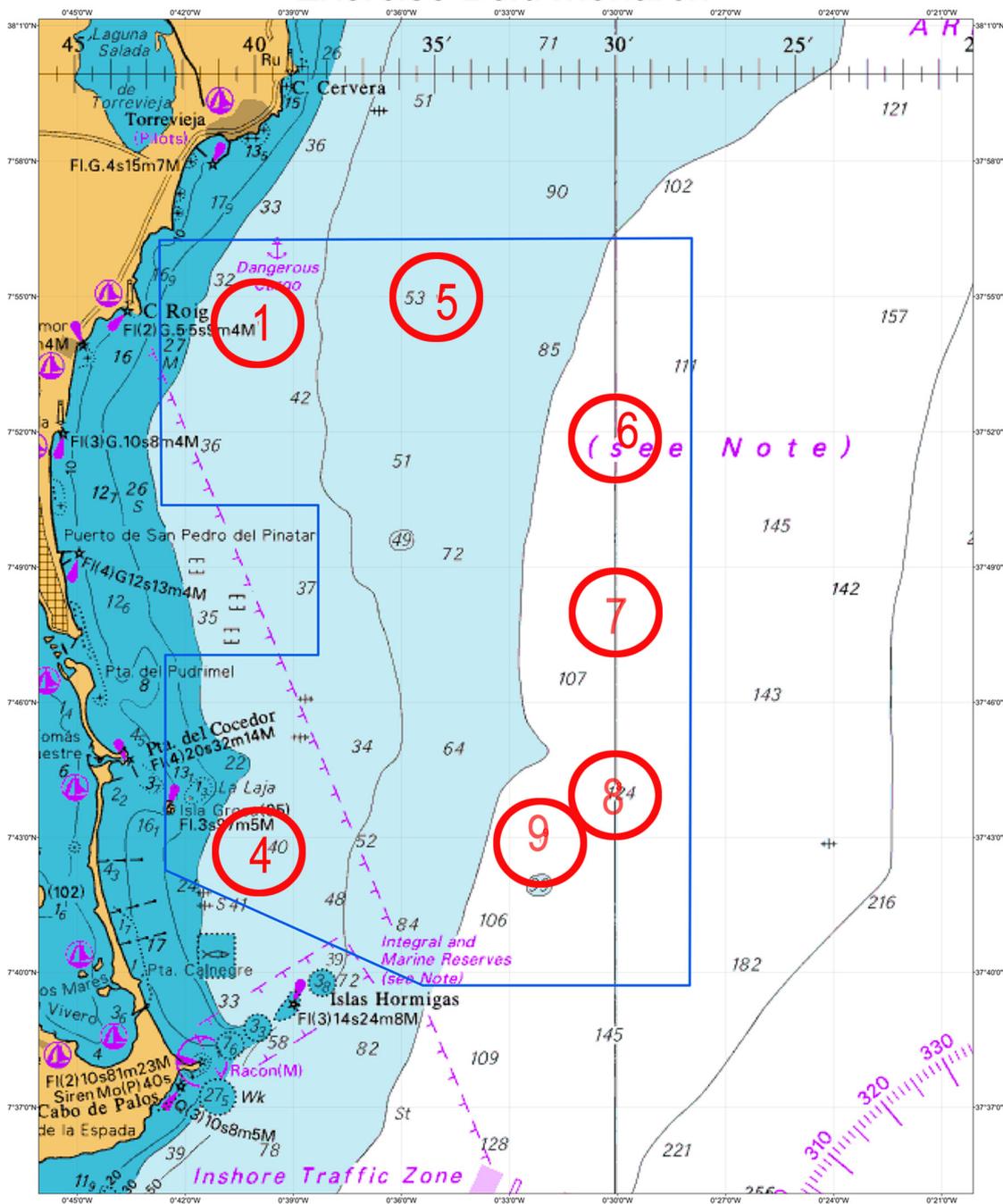
For a disabled submarine below the depths at which divers can work, an Atmosphere Diving Suit (ADS) will safely allow the same tasks to be carried out. As the illustration shows, ADS is a self contained one man submersible suit and is capable of long endurance dives down to the maximum depths at which rescue can be performed.

# Exercise Area

The BMH11 exercise area is shown below. Close to Alicante and Cartagena the ships and submarines will operate in Spanish submarine exercise areas. The red area on the diagram below is the bottoming area for submarines and the red circles on the adjacent page depict the actual bottoming sites the submarines will sit in as they undergo rescue operations by the participating ships and rescue vehicles.



# Exercise Bold Monarch



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errors to: [errors@ni.gov.uk](mailto:errors@ni.gov.uk)  
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Scale accurate only at centre line of chart

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