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Dated, the 27 July, 2017

REQUEST OF EXPRESSION OF INTEREST

It is to inform that National Disaster Response Force (NDRF) intends to procure Personal Diving Kit [Self Contained Under Water Breathing Apparatus (SCUBA)] on the specification prepared by a detailed BOOs of NDRF having latest technology which is attached as Appendix – "A".

2. All the interested vendors/manufacturers are hereby invited to submit their comments / suggestion on the technical specifications of the equipment as mentioned in the Appendix – "A" to this HQ within 15 days from the date of issue of this expression of interest for further course of action.

Encl: Appendix – A (5 Leaves)

MKumar 27/07/2017

(Muneesh Kumar)
Dy. Commandant (Proc.)
HQ DG NDRF

Copy to:
IT Cell, HQ NDRF for needful action please.

APPENDIX - A

SELF CONTAINED UNDER WATER BREATHING APPARATUS (SCUBA)

Role: - Self Contained under Water Breathing Apparatus (SCUBA) is to be used to conduct under water search and recovery operation. The Complete set of the equipment should enable divers to conduct operation in cold or contaminated water.

General: - The apparatus should be rugged, light weight and suitable for single person use.Maximum operating depth to be 100Mts

The set should be provided with following items as: -

- Dry Suit
- Swimmer Knife.
- Weight Belts with weight.
- Dive Fins
- Divers body harness for connecting life line (with life line and carabineer)
- Breathing Apparatus with Compressed air cylinder
  - i. Full face Mask with breathing demand valve.
  - ii. Regulator Unit.
  - iii. Buoyancy compensating device.
  - iv. Octopus
- Communication set (wireless)

Ser No	Description
1	**Dry Suit**
	Dry suit should consists of following items • Full Body suit (main suit) • Boots (Attached) • Hood (Detachable) • Inner suit (for thermal Protection) • Connection for inflator hose. • Dry Socks • Dry Gloves
	Suit should be of Neoprene/ Tri Laminate/ Latex or combination of all.
	Entire suit including seams & zipper should be water proof
	Weight of suit including hood boot and under suit not more than 10 Kgs
	Under suit should be full sleeves with full length leggings
	Color of suit – Orange
	Thickness of main body suit 3 – 6 mm
	Should have water tight Latex / Neoprene Neck / Collar & Wrist Seals.

	Should have expandable utility pockets with easy accessibility
	Should have capability to inflate and deflate through automatic adjusting valves with change in depth to avoid squeeze on descent.
	The valve should be compatible with existing face mask as well as with Full face mask provided with the SCUBS set.
	Boots should be rugged in touch and feel.
	Should be easy to wear and provide enhanced flexibility in upper body portions.
	Suitable connectors for inflator hose to be supplied along with product.
	Should have additional strengthing / padding on high wear areas for additional strength.
	Suit and boot should be available in all sizes, S, M, L, XL, XXL.
	Dry Gloves
	Gloves should be made of same material of which dry diving suit is made.
	Palm of the gloves made up of anti-slippery finish.
	Thickness should be 3 – 6 mm
	The gloves should be suitable for divers up to a depth of 100 mtr.
	Dry Socks
	The Dry socks should be in conjunction with above mentioned wet suit should be made of similar material like dry suit. It should have non slippery sole, which reduces wear and prevents slipping on wet or slippery surface.
2	**Swimmer Safety Knife**
	Swimmer safety knife should be able to cut obstruction, rope, Net etc under water.
	Blade 17-20 cms (approx). MATERIAL : Non corrosive
	SHAPE OF THE BLADE : Razor sharp smooth cutting edge on one side with considerable 'belly' or curve and should include a sharp line cutter hook for cutting fishing lines and leaders. The backbone of the blade to have a heavy serrated edge (Wavy or rounded serrations) running nearly the full length of one side.
	KNIFE TIP : Pointed.
	HANDLE: The size of the handle should be about 110-120 mm in length, with reasonable width so that a diver can hold the knife comfortably in water. The material used for handle should be black in colour, marine proof-Thermo rubber material externally and rubber / polypropylene internally with non-skid surface. There should be an effective guard / ridge / thumb rest between the handle and the blade to prevent fingers from slipping onto the sharp edge. There should be one lanyard hole at the top end of the handle with a brass metal eye (rounded edges) to secure the knife.
	WEIGHT – Approx 300 gms. LENGTH >= 20 cm.
3	**Weight Belts with weight**
	To attach lead weight of 1 Kg& 2 kg (4 Nos) to divers to adjust buoyancy during diving operation
	Waist belt should be made of polypropylene/ nylone fabric provided

	with quick release non-breakable buckle of Fiber/ non – corrosive soft metal. The belt should be adjustable size as per user requirement.
	The belt should be adjustable for 30" to 45" in length, Thickness 3mm (approx.) width of the belt 2".
	Color Black
	Weight – 04 Nos Lead weight of 1 Kg & 2 kg each to be provided with the belt should have 6 pockets make of similar material and pocket flap should be provided with Velcro/quick fix botton to close pocket.
4	**Dive Fins**
	Dive fins to be provided to assist divers in hands free swimming on surface and under water.
	DESCRIPTION – Colour black, length not less than 17", width not less than 4" (top) and 8.8" (bottom).
	MATERIAL : Thermoplastic flexible. Should not skid even on a wet metal surface/ plastic floor board etc
	HYDRODYNAMIC SHAPE : The shape of the fin to facilitate Max propulsion whilst swimming in water.
	SHOE POCKET : Pocket should be 7"-8" deep with an adjustable back strap (not less than 1.5 inch in width). Inner part should be made of soft rubber for use with bare feet. One additional back strap should be supplied with fins.
	WEIGHT : not more than 1.5 kg
	BUOYANCY : Approximately 10% negatively buoyant.
5	**Divers body harness with life line**
	The Equipment to be provided with belt type harness attached with non-corrosive metal buckle. The belt should be provided webbing strap style which should be going over the shoulders of the divers. At the top of the shoulder a loop to be provided for attaching life line. The width of the strap of the 2" made of poly propylene.
	The life line made of 8 mm poly propylene rope to be provided with the equipment. Length not less than 100 mtr. It should have a visible yellow mark at an interval of 3 mtr and red mark at the interval of 15 mtr. To be provided with stainless steel carabineer for attachment at both end of the rope.
	Harness, on which the cylinder will be mounted, to enable divers donning the compressed air cylinder.
6	**Breathing Apparatus with Compressed air cylinder**
	Compressed air cylinder Cylinder should be made of composite material with unlimited life and should be providing cylinder pack – 02 Nos (1 main + 1 Reserve). Charging pressure 300 Bar and nominal capacity of set 10 to 12 Ltrs. weight of cylinder not more than 15 kg there should be mechanism to have a reserve air in the set and indication to that effect available . The reserve air should be enough to provide to driver breathing air for more than 15 Min.
	i. Full face Mask with breathing demand valve. Designed for underwater utilization for emergency, commercial &

	technical uses. The mask will be comfortable & weight be restricted to 900 grams. The mask will have a wide-view vision visor and the shape will allow even for use of spectacles for the wearer. The visor will be made of scratch & impact resistant transparent polycarbonate with wide visual field. The head harness will have 6 straps – all directly attached to the face shield in a design that allows the pressure to be transmitted uniformly along the mask's skirt. Air circulation in the mask will minimize fogging of the lens and reduce the amount of CO and CO2 built up in the inhaled air. The face mask will be equipped with a Surface Valve allowing the diver to breathe fresh air when on surface and save precious tank air. Face mask will also have provision to connect communication system (DUCS or WUCS) or Video Camera or Torch when required. The face mask will be supplied complete with an INTEGRATED second stage **REGULATOR** (demand valve) and can be connected to the 1st stage via a breather hose. Will be certified to EN250 standard.
	ii)Regulator Unit A Pressure compensated regulator unit with first stage regulator to convert cylinder HP pressure to low pressure having 2 HP Ports and 4 LP Ports. Will be supplied with a CONSOLE for PRESSURE GAGE (0-350 bar) and DEPTH GAGE (0-80m).
	iii) Buoyancy compensating device. The BCD Harness basic structure will be comfortable to wear and have provision for mounting cylinder and other accessories on the set. It will come with adjustable straps so as to make fit and ensure free movement of the diver. It should be fitted with inflation option through main cylinder or mouthpiece, Deflation through 3 rapid dumping valves including 2 over-pressure valves. Pockets / recess for detachable weight should be available. Atleast 5 SS D-Rings. Single Bladder Made of Cordura 1000 D outside and nylon 420 D inside.
	iv) Octopus An additional second stage with hose for use in emergency in case air supply to face mask fails or for use by the buddy diver. It will connect to the Regulator first stage.
	v) In case the diver does not want to use the full face mask than the breathing valve with mouth piece should be enough for the use under water. Mouth piece should have separate inhale and exhale channel so that the moisture from the driver cannot get deposited in the inlet section of the breathing valve. This avoids risk of valve freezing in open positions. **vi)** An additional Half face mask should be provided with the equipment.
7	**UNDER WATER COMMUNICATION SYSTEM (WIRELESS TYPE)**
	i. **Introduction:** The equipment should be rugged and reliable for Wireless communication during diving operations between divers and surface team. It should be suitable for continuous use for more than 5 hours. ii. **Essential Parameters:** The apparatus should be rugged, lightweight suitable for carrying by single person. The set should comprise of following:-

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	a. Should allow clear voice communication between the surface supervisors and at least 4 divers should be able to talk among themselves. b. The Surface panel should have volume control and squelch facility. c. Communication should be of wireless with a minimum range of 400 mtrs. d. Should be battery powered with an endurance of at least 05 hours before recharge is needed. e. Surface unit should have a head set and microphone. It should also held mike for supervisor. f. The surface unit should have fully portable. g. The Equipment should work up to depth of 30 mtrs in water. iii. **General Parameters :** a. Weight of Diver Unit : Less than 1 Kg + 10% b. Diver Unit pressure compensated : 10 mtrs + 10% c. Weight of Surface panel : 6 Kgs + 10 % iv. **Supervisor Head Set :** The supervisor headset should permit hands free use of and Panel the headset on the diving site and permit free movement in a radius of at least 01 meter on the diving site. v. **Main Components :** Each Under Water Communication System (Wireless Type) shall comprise of the following:- a. Surface Headset and Microphone -01 b. Portable Surface Unit with Transducer and Cable-01 c. Diver Receiver with Microphone-04 d. The case provided with the equipment should be made up of High Strength Polypropylene copolymer resin. The case should be water proof and dust proof with ingress protection grading (IP 67). The case should be corrosion and impact resistant. It should have quick closing/release latch system. The case should be provided with sufficient carrying handle for easy carrying big box as per size of box. Handle should be provided with cushion for comfort. The box should be light in weight. Boxes should be filled with cubed foam/customized foam for cushion. It should have provision of lock in it. The case should have automatic ambient pressure equalization valve Latches, Handle and wheel should be field replaceable. e. Operational and technical manual should be supplied with the equipment.

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