



# Emergency Response Sanitation Unit

**Booklet for Setting Up a Training for Sewer  
Entry Professionals**



BILL & MELINDA  
GATES *foundation*



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# I. Emergency Response Sanitation Unit

The practices of manual scavenging and hazardous cleaning of sewers and septic tanks are not only illegal under the Prevention of Employment as Manual Scavengers and their Rehabilitation Act (PEMSRA, 2013) but also under various provisions of the Indian Penal Code. However, there still are extreme situations when a sewer or septic tank gets blocked and no amount of mechanical equipment can offset human intervention causing overflow of sewage into roads and public spaces and exposing citizens to serious health hazard.

Sanitation workers in developed nations who enter such potentially hazardous confined spaces are always properly equipped and trained to ensure their health and lives are not compromised.

The primary reason for occurrence of deaths in sewers and septic tanks in India is understood to be due to non-use of personal protective equipment (PPE) and poor state of training of the person entering the confined space as well as non-adherence to security protocols by the operators and their supervisors in field.

Since, improvement in the level of urban sanitation in India, will invariably lead to increase in number of sewer maintenance holes and septic tanks and the need for their management, it is need of hour to systemise human entry into sewer/septic tank through organization of a professional, well trained, motivated and appropriately equipped establishment called Emergency Response Sanitation Unit (ERSU).

ERSU primarily aims to provide professional, well trained, motivated and appropriately equipped workforce for the maintenance and management of sewer network and septic tanks. It thus eliminates the deaths caused by entry of Sanitation Workers into sewers and septic tanks without adequate skill, use of proper PPEs and non-adherence to safety protocols.

## *The Sewer Entry Professionals (SEP)*

Many sanitation workers often enter dangerously narrow spaces such as inspection chambers in sewer networks or even septic tanks and other containment systems in case of a breakdown. These professionals have been termed Sewer Entry Professionals or SEPs.

They are exposed to poisonous gases, pathogenic organisms and risky environments where there is a high probability of getting physically injured without the appropriate safety devices and personal protective equipment (PPE). These professionals need to be trained on the protocol to be followed to mitigate these risks.

## 2. Who can be a sewer entry professional?

As per the guidelines formulated by Ministry of Housing and Urban Affairs, Government of India:

- a) Sewer Entry Professionals (SEPs) may preferably be selected from traditionally employed sanitation workers. They must be comprehensively trained on their job and safety/security measures so that they do not risk their lives in cleaning of sewer/septic tanks
- b) It is not necessary to employ all the SEPs on permanent government strength. Professionally trained and equipped Private Sanitation Service Organizations (PSSOs) may also be

empanelled by respective ERSUs to provide an assured number of private SEPs (pSEPs) and equipment sets.

- c) These PSSOs should also preferably employ those persons who have been traditionally engaged in sewer/ septic tank cleaning in the area.

**For entry into confined space, such as sewer maintenance hole or septic tanks, the person must adhere to the following requirements.**

Persons considered for employment in confined spaces shall be physically fit and capable of understanding training given. Those with the undernoted disabilities shall not be recruited for this type of work and those who contract these should cease to be employed in this capacity:

- A history of fits, blackouts or fainting attacks;
- A history of heart disease or disorder;
- High blood pressure;
- Asthma, bronchitis or a shortness of breath on exertion;
- Deafness;
- Meniere's disease or disease involving giddiness or loss of balance;
- Claustrophobia or nervous or mental disorder;
- Back pain or joint trouble that would limit mobility in confined spaces;
- Deformity or disease of the lower limbs limiting movement;
- Chronic skin disease;
- Serious defects in eyesight; and
- Lack of sense of smell.

### 3. What to expect from the Training?

This particular training programme is aimed at training the core sanitation workers also recognised as Confined Space Entry Professionals (CSEPs) who work in extremely hazardous conditions - such as inside sewer lines and septic tanks where machines can't do the job. They are exposed to poisonous gases, pathogenic organisms and risky environments where there is a high probability of getting physically injured. A big percentage of the Sanitation Worker Force often enter dangerously narrow spaces such as inspection chambers in sewer networks or even septic tanks and other containment systems in case of a breakdown. And they often do this in absence of a safety net.

Therefore, this training aims at attempting to change the preparedness, knowledge levels and the safety conditions of the sanitation workers.

#### *Agenda for Training of Sewer Entry Professionals*

The objective of this training is:

1. Make SEPs aware of the latest Standard Operating Protocol to be followed as per the directives of the ERSU Advisory
2. Inform them of safe practices and possible risks to help them safeguard themselves

A list of requirements for organizing this training is attached in [Annexure 3](#) along with a sample Feedback form in [Annexure 4](#)

Time	Session	Seat Time (mins)	Type of Session
<b>Day 1</b>			
10:00	Registration	30	
10:30	Introduction to Training + Pre training assessment	60	Plenary + Interactive session
11:30	Break	10	
11:40	Personnel Protective Equipment - Theory	30	Plenary + Interactive session
12:10	Donning and Doffing PPE	35	Activity
12:45	Basics of Confined Space Entry (Sewage Entry / Septic Tank)	45	Plenary + Interactive session
13:30	Lunch	60	
14:30	Site Preparedness, Lockout / Tagout, Identifying Accessibility and Exit points	60	Plenary + Interactive session
15:30	Emergency response Sanitation Unit protocol	30	Plenary + Interactive session
16:00	Break + Assemble for Mock Drill	15	
16:15	Mock Drill	75	Activity
17:30	Feedback and closing remarks	15	Interactive Session
<b>Day 2</b>			
10:15	Recap exercises	15	Exercise
10:30	Standard Operating Procedure to work in Maintenance hole & Septic Tanks	60	Plenary + Interactive session
11:30	Break	10	
11:40	Identifying Hazard & Evaluation	60	Interactive Session
12:40	Atmosphere Testing / Types of Gases	35	Interactive Session
13:15	Lunch	60	
14:15	Rescue & Basics First Aid	30	Plenary + Interactive session
15:15	Break + Assemble for Mock Drill	15	
15:30	Mock Drill	60	Exercise
16:30	Feedback and post training assessment	60	Plenary + Interactive session
17:30	Closing remarks	15	
17:00	Certificate Distribution + Group Photograph	30	



## 4. Glimpses of the Training



Figure 1: Barricading and site preparation procedure being explained



Figure 3: Work planning and safety pep talk with team members



Figure 2: Wearing of PPE





Figure 4: Gas testing inside the maintenance hole



Figure 5: Setting up the equipment for entry of person



Figure 6: Entry procedure of professionals into the sewer maintenance hole



Figure 7: Performing rescue from sewer maintenance hole



Figure 8: Procedure for first aid post retrieval of persons from sewer maintenance hole














## 5. Equipment Requirement




Below is a list of the equipment required for the ERSU training. Cost of required PPE and equipment is attached as [Annexure 1](#). Budget for sewer maintenance hole is attached in [Annexure 2.m](#)




### a) List of Essential Equipment

S.NO	ITEM	IMAGE	S.NO	ITEM	IMAGE
1	Helmet		14	Barrier cones with tape	
2	Eye Protection - Goggles		15	Caution Board	
3	Reflecting Jackets		16	Air blower ventilation system	
4	Safety Gloves		17	Full body harness and wrist sling	
5	Safety Boots		18	Aluminium Ladder	
6	Full coverage suit		19	Tripod Retrieval System	
7	Multi Gas Mask		20	Multi Gas Monitor	
8	Multi Gas full face mask		21	Lead acetate testing strips	
9	Full body wader suit		22	Rope - 150 ft	

10	Fishing Wader suit		23	Lock-out & tag out for Valve	 
11	Electrical Lock-out & Tag Out		24	Shower with Eye Wash	
12	First Aid Kits		25	Emergency Medical Oxygen Resuscitator kit	
13	Stretcher		26	Model Maintenance hole	

*b) List of Non Essential Equipment but good to have*

S.No	Equipment name	Image
1	Modular Airline supplier with trolley	
2	Breathing Apparatus	
3	Modular Airline supplier	

4	Airline Respirator with manually operated air blower	
5	Modular Airline supplier with full face and hood	
6	Snake catching kit- with bag	

## 6. Testimonials from previous trainings

“The trainers explained how to enter confined spaces, sewer networks, rescue mates and ensure personnel are safe while working in these confined spaces. They taught us about hazardous gases which are invisible but harmful, and we understood thoroughly how to keep ourselves and our team mates safe.

The best part of the training was that all the participants, be it the sanitation workers or officers were all the same. It felt like we have come from the same family. After I return I am planning to train the Sewer Entry Professionals working under me, on how to work safely, stay safe from the hazardous substances in the sewer lines”











*Santosh Kumar Behera, Operation and Maintenance Agency, Cuttack*



“We found out that two sanitation workers died during a maintenance work, this had happened due to lack of precaution and safe practices, something that needs to be avoided at all costs and this is what we came to learn here. In this 3-day training we have gathered from across Odisha. We have learnt how to use the latest equipment that is available to us and can be given to the trainers. In this Master Training, we learnt the right protocol to be followed before entering a maintenance hole. We learnt about essential PPE that a SEP must wear before entering to avoid exposure to hazardous gases. We also learnt how to rescue SEPs, the protocol behind it. It was wonderful to learn of all the ways we can make entry into sewer spaces safe, such that lives are not lost again.”

*Ranjita Kumari Dash, Assistant Manager, Unit I, Bhubaneswar, WATCO*



## Annexure I: Cost of equipment and PPE required for the ERSU training.

S.No	Required PPE	Picture	Cost of Equipment (INR)		
1	Safety Helmet		Karam 175/- per pc	3m – 365/- per pc	udyogi-150/- per pc
2	Safety goggles		Basic-80/- per pc	3m-125/- per pc	udyogi-100/-
3	Jacket		Basic-100/- per pc	3M-360/- per pc	Medium-175/- per pc
4	Safety Gloves		Basic-65/- pair	medium-125/- pair	premium heavy -185/- pair
5	Gumboot		Basic-300/-	medium-400/-	Premium-675/- pair
6	Coverall		Basic--750/- per pc	Medium-950/-	Udyogi-1250/- per pc
7	Gas mask		Glass type - Venus -4850/-, 3m-7100/-, scott-5850/-, Honeywell-6750/- Without glass--Venus-575/-, 3M-1350/-, Venus double cartridge-1250/-, 3M double cartridge -2750/- per pc		
8	Caution Board		330/- per pc		
9	Full body harness		Udyogi-1250/-, shock absorber belt -1950/-, karam-1450/-, shock absorber type -2250/- per pc, Wrist belt -1100/- per pc		
10	Tripod retrieval		Karam-148875/- per set		udyogi-98875/- per set

11	Multi gas monitor		Honeywell--59875/- per set		
12	Rope		Basic-45/- per ft		Premium-65/- per ft

## Annexure 2: Tentative Budget for Sewer Maintenance Hole

S.No	Items	Unit	Amount (INR)
1	12mm Base Plate (18"x18")	4 Nos	13,760
2	12mm Base Plate (12"x12")	6 Nos	
3	12mm Base Plate (10"x10")	2 Nos	
4	Square Pipe (4"x4")	2 Length	7,500
5	3"x1 1/2" Channel	4 Length	9,000
6	3"x1 1/2" Pipe	2 Length	3,100
7	1 1/2"x1 1/2" Pipe	15 Length	13,760
8	1 1/4"x1/4" Plat	15 Length	7,800
9	8mm Sheet (8'x4')	2 Nos	34,000
10	1 1/4"x1/4" Angle	6 Length	6,000
11	Welding Rod	5 Box	1,450
12	4" Cutting Wheel	20 Nos	300
13	14" Cutting Wheel	2 Nos	300
14	Panting work	LS	7,000
15	Acrylic Sheet	LS	3,500
16	Labours	7 Days	14,000
17	Unforeseen Items	LS	3,530
		<b>Total</b>	<b>1,25,000</b>

## Annexure 3: List of Requirements for Organising a Training for Sewer Entry Professionals

### *Training Essentials*

S. No	Item	Done
1	Projector	<input type="checkbox"/>
2	Screen	<input type="checkbox"/>
3	Microphone + sound system	<input type="checkbox"/>
4	Whiteboard/Blackboard	<input type="checkbox"/>
5	Whiteboard marker/chalk	<input type="checkbox"/>
6	Flipcharts	<input type="checkbox"/>
7	Meta Cards	<input type="checkbox"/>
8	Bold Markers	<input type="checkbox"/>
9	Sketch Pens	<input type="checkbox"/>
10	Toffees/candy	<input type="checkbox"/>
11	Pin board with pins or a board to stick the flipcharts/meta cards	<input type="checkbox"/>
12	Hand sanitiser	<input type="checkbox"/>
13	Name tags with lanyard	<input type="checkbox"/>
14	Face Masks (surgical/n95)	<input type="checkbox"/>
15	Pen and Notepads for participants	<input type="checkbox"/>

### *Essential Equipment*






















S. No	Item	Done
1	Helmet	<input type="checkbox"/>
2	Eye Protection - Goggles	<input type="checkbox"/>
3	Reflecting Jackets	<input type="checkbox"/>
4	Safety Gloves	<input type="checkbox"/>
5	Safety Boots	<input type="checkbox"/>
6	Full coverage suit	<input type="checkbox"/>
7	Multi Gas Mask	<input type="checkbox"/>
8	Multi Gas full face mask	<input type="checkbox"/>
9	Full body wader suit	<input type="checkbox"/>
10	Fishing Wader suit	<input type="checkbox"/>
11	Barrier cones with tape	<input type="checkbox"/>
12	Caution Board	<input type="checkbox"/>
13	Air blower ventilation system	<input type="checkbox"/>
14	Full body harness and wrist sling	<input type="checkbox"/>
15	Aluminium Ladder	<input type="checkbox"/>
16	Tripod Retrieval System	<input type="checkbox"/>
17	Multi Gas Monitor	<input type="checkbox"/>
18	Lead acetate testing strips	<input type="checkbox"/>
19	Rope - 150 feet	<input type="checkbox"/>



20	Lock-out & tag out for Valve	<input type="checkbox"/>
21	Electrical Lock-out & Tag Out	<input type="checkbox"/>
22	Shower with Eye Wash	<input type="checkbox"/>
23	First Aid Kits	<input type="checkbox"/>
24	Emergency Medical Oxygen Resuscitator kit	<input type="checkbox"/>
25	Stretcher	<input type="checkbox"/>
26	Model Maintenance Hole	<input type="checkbox"/>
27	Flexible Sewer Cleaning Rod	<input type="checkbox"/>
28	Manual Grabber	<input type="checkbox"/>

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## Annexure 4: Feedback Form for Sanitation Workers

S. No.	Question	Answer
1.	How was the registration process to be part of the training?	  
2.	How happy are you with the training curriculum and content?	  
3.	How happy are you with regard to the training tools used?	  
4.	How happy are you with the trainer?	  
5.	Did you enjoy being part of the training?	  
6.	How useful do you think the training was in your opinion?	  
7.	Did you feel safe/ comfortable sharing your queries/ concerns during the training?	  
8.	What else do you think should be made part of the training which would be useful for you?	I. More Videos II. Games III. Interactive Content IV. Group Exercises V. No change VI. Any other _____
9.	Anything else that you would like to share/query you would like to raise	

## Annexure 5: Infrastructure cost for the training

Infrastructure Cost			
S.No	Items	Unit	Amount (INR)
1	Sewer Maintenance Hole	1	1,25,000
2	Safety Helmet	1	150
3	Safety goggles	1	80
4	Jacket	1	100
5	Safety Gloves	pair	65
6	Gumboot	pair	300
7	Coverall	1	750
8	Gas mask	1	1,250
9	Caution Board	1	330
10	Full body harness – Shock absorber belt	1	1,250
11	Wrist belt	1	1,100
12	Tripod retrieval	1	98,875
13	Multi gas monitor	1	59,875
14	Rope	150 ft	6,750
<b>Total</b>			<b>2,95,875</b>





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