

## **Report of the Sub Committee Meeting on “ Environmentally Sound Disposal of Polychlorinated Biphenyles (PCBs) oil in the Welding Sector.**

### **Committee Members:**

- |                              |   |   |
|------------------------------|---|---|
| 1. Mrs. Sujeewa Fernando     | - | AD/ EPC&CM ( Convener)                                  |
| 2. Mr. S M Werahera          | - | DD/ EPC&CM(Member)                                      |
| 3. Mr. T.D. A Gamage         | - | AD/C & HWM( Member)                                     |
| 4. Ms. Hasanthi Dissanayake  | - | Senior Research Engineer ( ITI)(Member)                 |
| 5. Ms. Niroshi Pieris        | - | Programme Secretary ( Member)                           |
| 6. Ms. Arosha Fernando       | - | Business Development Management /INSEE( Member)         |
| 7. Mr. Dulan Amarasekera     | - | Business Development Engineer(Member)                   |
| 8. Mr. K A A Prabhath Kumara | - | Vice President ( People to People Volunteers) ( Member) |

**Background:** The above sub committee was appointed at the 12<sup>th</sup> Project Steering Committee held on 12.12.2018 to study and provide a report to the 13<sup>th</sup> Project Steering Committee on “Environmentally Sound Disposal of Polychlorinated Biphenyles (PCBs) waste in the Welding Sector” .

Two committee meetings were held on 12.12.2018 and 14.02.2019.

### **The TOR provided to the committee :**

- (1) Identify the cost effectiveness of testing of transformer oil samples of all welding transformers identified in the inventory and disposing the oil of contaminated transformers against total disposal of transformer oil in welding transformers identified in the inventory.
- (2) Develop a mechanism to collect, store, transport and safely dispose PCBs in Welding Sector.

The committee members studied the following 02 options in relation to the disposal of PCB contaminated welding transformer oil:

1. **Option 01:** Dispose transformer oil in all welding transformers identified in the inventory.
2. **Option 02:** Test all transformers in the inventory using test kits and dispose only the contaminated transformer oil. ( PCB >50ppm)

**Option 01: Dispose transformer oil in all welding transformers identified in the inventory.**

No of transformers available in Sri Lank	= 10,177
The cost of cleaning a Welding transformer	= ( Labour, material and transportation)
Cost of providing new transformer oil)	Rs 3500.00
The refilling all transformers	= Rs 180 x25L
The total cost for refilling	= Rs 4500.00
The cost of disposal of oil in 01 transformer	= Rs. 4500+ 3500.00 = Rs 8000.00
The total Cost	= Rs 8000.00 x 10,177 = Rs 81,416,000.00 + final treatment cost (T)

**Option 02: Test all transformers in the inventory using test kits and dispose contaminated transformers. ( PCB >50ppm)**

<b>Cost of testing a sample</b>	=	Rs 3000.00
Testing Cost	=	Rs. 1500.00
Testing samples of all transformers in the inventory	=	Rs 4500.00 x10,177
( Using test kits)	=	Rs. Rs 45,796,500.00
Percentage of PCB contamination in welding sector	=	15.87%
( Out of the tested samples 15.87% is contaminated)		
Total cost for cleaning and refilling 15.87% (1615 ) welding equipment	=	( Rs 8000x1615)
	=	12,920,000.00
Total cost for removing PCBs contaminated transformer oil from tested welding equipment	=	45,796,500.00+Rs.12,920,000.00 = Rs. 58,716,500.00 + Final Treatment Cost (T)
Total amount of PCB Oil needs disposal	=	1615 x 25L
	=	40,375L

\* Some welders maintain extra transformer oil stocks. During the study 624 welders were identified having extra-stocks. This quantity too needs to be disposed. But this was not considered for calculations as the quantity of the stock varies from time to time.

**Assumptions:**

(\*Generally a transformer contains 21-25L of transformer oil, and cleaning of a transformer requires around 03 liters of diesel. Therefore considering both the value was taken as 25L)

\* 1623 Damaged /Scarp equipment were found during the study and 711 oil spills too were identified. The oil spills need to be decontaminated.

<b><u>Treatment Cost :</u></b> Treatment of PCB Container ( 1000L)	=	<50ppm *
	=	50ppm – 250ppm**
	=	>250ppm – 1000ppm***
	=	> 1000ppm****

\* Rs 170,000.00 per 1000 liters (01MT)

\*\* Rs 716,949.20 per 1000 liters(01MT)

\*\*\* Rs 2,116,975.80 per 1000 liters(01MT)

\*\*\*\* Will have to be decided based on the treatment criteria

Heavy Furnace Oil (HFO) will be used for dilution of the PCBs in contaminated transformer oil.

**2.Develop a mechanism to collect, store, transport and safely dispose PCBs in Welding Sector:**

The committee recommends the following methodology, considering the practical situation.

**Methodology:**

Considering the detailed transformer distribution list, Peoples to People needs to develop a collection schedule and collect contaminated transformer oil district wise. Initially Peoples to People has to test the transformers using test kits, identify the contaminated transformers and collect transformer oil from contaminated transformers. After emptying the transformers, they need to be washed them with diesel thrice. (Triple Rinsing) and collect the transformer oil and contaminated diesel separately into the Intermediate Bulk Containers (IBCs). Once the IBC s are full in capacity they should be transported to INSEE Colombo Centre or Puttlam Treatment Plant.

As the new transformer oil has to be supplied to the welders after cleaning of the contaminated transformers, Peoples to People will have to transport new (uncontaminated) transformer oil to the welders. According to the practical experience around 05 transformers could be cleaned and refilled per day and collection schedule has to be made accordingly.

The Personal Protective Equipment (PPE) used during the cleaning and refilling process has to be collected separately and stored safely until safe disposal. Spill cleaning and management procedures have to be followed during the process.

**To facilitate the above process the following recommendations were made by the committee.**

1. "People to People Volunteers " to improve the existing transportation vehicle and obtain the Scheduled Waste Management License from the Central Environmental Authority for the collection and transportation of contaminated transformer oil (Hazardous Waste)
2. Peoples to People Volunteers to develop a "Collection and Transportation schedule of PCB contaminated Transformer oil" considering the requirement of all districts as INSEE could treat around 2000L per month.
3. People to People Volunteers" to collect the tested samples and remaining stock of transformer oil at Industrial Technology Institute ( ITI ) and transport them to INSEE for treatment.
4. INSEE to seek the possibility of storing the contaminated diesel.
5. After completion of the transformer oil disposal the Intermediate Bulk Containers (IBCs) treated, shredded and disposed along with all the used test kits and PPE.
6. INSEE and "Peoples to People" to sign an agreement before initiating the project.
7. Request UNIDO to provide funds for disposal activity under direct or indirect funding after selecting a bidder through International Competitive Bidding. (ICB), or seek the possibility of securing funds from other sources. ( eg. SAICM)
8. Ministry of Mahaweli Development and Environment to issues required official letters to INSEE and Peoples to People or any other required institution to facilitate the process.
9. It is recommended to carry out a "Pilot cleaning test"to identify other hidden costs.

**Recommendations :**

1. It is recommended to test the transformers and dispose only the contaminated PCB oil.
2. It is recommended to decide on the disposal methodology of PCB contaminated transformer oil considering the source of funds and fund availability.

No	Name	Signature
1	Mrs. Sujeewa Fernando	

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