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## GUIDE LINE NOTE FOR MANAGER OF ON-SITE POTENTIALLY INFECTIOUS MEDICAL WASTE (PIMW) TREATMENT AND DISPOSAL FACILITY (TDF)

### Introduction:

This note presents typical situation that arises at many of on-site PIMW Treatment & Disposal Facility (TDF). It is intended that this information will help the TDF Manager to oversee their operations and take corrective incremental improvement measures.

### PIMW Packaging:

The waste bags received at the central TDF for Treatment and Disposal have following drawbacks:

1. There are no Labels on the ~~on-site~~ waste bags with required Waste Tracking information. The required information should include: a) Nomenclature of the department from where the waste has been sent; b) Day, Date and Time of waste packing; c) Brief description of waste contents.
2. Often the bags are not adequately packaged with double-bags or protective box, resulting in bag tears and spill of blood over the TDF floors.
3. Bags contain unwanted materials such as glass bottles and metal caps.
4. There is no means of checking if any radioactive contaminated waste is packed in the bags.
5. The size of bag/box is larger than the waste feed opening of waste treatment / disposal equipment.
6. Due to shortage of appropriate colour coded bags, any other bags are put to use.

The Waste Tracking labels will help the manager to identify any deficiency in packaging after the bags are received at the TDF, and to suitably advise the concerned department. Such an organised Waste Tracking system will be useful in the event the PIMW is to be sent to off-site TDF.

### PIMW Site Storage & Handling:

The following drawbacks are generally observed during Storage & Handling:

1. **The bags are stacked in a heap, one above the other. This creates damage to bags** resulting in blood leakage and waste material spills. When stacking is required to be done, then the bags should be placed inside sturdy boxes, suited for stacking.
2. Light bags containing low waste density materials are not sorted and kept separately from heavy bags containing high waste density materials. This is very useful to decide upon the waste mix feed for Incineration.
3. Adequate space is not available for waste storage, without stacking.
4. Storage area is not protected from Vectors such as rodent, birds etc.,
5. For overnight storage or during treatment plant shutdown, the waste should be stored in locked place and be non-accessible non-classified staff. This is lacking.
6. Record keeping of waste bags / boxes received should be maintained. These records should be tallied with records of waste treated and waste sent from various locations to TDF.
7. Blood spill kits containing sorbent material, disinfectant, disposable cleaning cloth, disposable dustpan & brush and plastic bag should be available for cleanup and disposal of spilled blood. In absence of this it is found that the blood spill on the floor is washed down and pushed into the drain. Later non-disposable cotton cloth is used to clean the floor with disinfectant water solution. This is unhygienic as well as hazardous in case of infected pathogen contents in blood.

Site storage area and TDF area should be maintained aseptic, at all times.

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**Incinerator Disposal System:**

Following aspects of Operation and Maintenance should be attended to wherever required. This is a vast and specialised subject and in case of any problems, separate documents should be referred and advice sought. Other notes on the subject should be referred to.

1. Dark black residual ash from an incinerator is an indication of unburned carbon. When this ash is dumped in open area, it could start / catch fire. It could also contain hazardous Products of Incomplete Combustion (PIC).
2. Incinerator location in a basement would inadvertently suffer from insufficient supply of combustion air. The operator will have no access to observe colour of smoke emitted from chimney, whilst making adjustment to waste feed and combustion adjustments.
3. Incinerator technical data such as: a) Primary Chamber 'Grate Area'; b) Primary Chamber 'Volume'; c) Secondary chamber volume; d) capacity and rating for forced draught fan and Induced draught fan, should be available with TDF office.
4. Heat release rate capacity of incinerator should be known.
5. Heat content of waste coming for incineration should be established, and accordingly waste feed into the incinerator should take place. Mixing appropriately, low-density (high calorific value) waste with high-density (low calorific value) waste.
6. Maintaining records of waste quantity incinerated and fuel oil consumption. Time and temperature record, during initial daily heat-up and whilst incinerator is in operation cycle.
7. Employment of qualified and trained incinerator operators is generally not done, to save on cost. Sanitation workers are posted as a part of reprimand towards their work attitude.
8. Annual plan for incinerator shut down for maintenance and repairs of wear and tear of components is not charted. Thereby no alternate arrangements are planned for waste disposal. There are no standby incinerators.

**Autoclave Treatment System:**

Some of the points concerned with treatment system are indicated below. Autoclave system is a vast subject, and separate study should be made for its efficient and effective operation. Some important points to be consider are:

1. Efficacy Spore testing with needs to be done as frequently as every alternate day. This is to ensure that effective Autoclave takes place for varying matrices of infectious waste feed. Such spore testing is not planned for. At many places required laboratory facilities for spores testing do not exist.
2. Sterilizer equipment, used for Autoclave of Infectious waste bags, is not provided with liners. This results in plastic film of waste bags sticking to the steam jacket surface. Resistance film so formed on the heating surface will retard the heat transfer rate, over a period of time.
3. At some of the hospitals, Autoclave is used for treatment of only plastic waste. For such users, proper care should be taken when large proportion of waste contains cellulose materials like cotton gauze, during shredding/grinding and disposal procedures.
4. Treatment of Emissions of Volatile Organic Compounds (VOCs) and Hazardous Chemical vapours from autoclave system, from the waste intermixed with the hazardous compounds, is not taken care of. This would be a serious threat to the environment and public health.

TDF managers are required to study the above aspects and bring plan for incremental improvement.