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Guidelines for PCBs, PCB-Containing Equipment and Waste Interim Storage

Central Power Research Institute (CPRI)
(An Autonomous Society under
Ministry of Power, Government of India)
Prof. Sir. C. V. Raman Road,
P.B. No. 8066, Bangalore – 560 080,
India
Website: www.cpri.res.in
Email: vvpattan@cpri.in
Phone: +91-80-2360 3527

Ministry of Environment, Forest and Climate Change (MoEFCC)
(A Government of India Organization)
6th Floor, Jal wing
Indira Paryavaran Bhawan
Jor Bagh, New Delhi – 110003, India
Website: www.moef.gov.in

United Nations Industrial Development Organization (UNIDO)
UNIDO Headquarters
Vienna International centre
Wagramersr . 5
P.O. Box. 300, A-1400 Vienna, Austria
Website: unido@unido.org

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1. FOREWORDS

This guidance document is based on the available standards for the safe storage of hazardous wastes and materials.

The aim of this guideline is

a. To provide information in a technical manner, about the storage of PCBs wastes and PCBs containing equipment.

b. To give practical reference and knowledge about the facilities and services related to PCBs waste storage, to be carried out under GEF funded project on PCBs.

c. To introduce different requirements of small storage sites for temporary storage of PCBs wastes and equipment; and a centralized storage site to be established near PCBs disposal facility.

According to Stockholm Convention, all the PCBs equipment identified by the deadline 2025 has to be stored in compliance with the countries' legislation on hazardous wastes, pending the final disposal deadline of 2028.

2. INDIAN LEGISLATION ON THE STORAGE OF HAZARDOUS WASTES

2.1. THE HAZARDOUS WASTE RULES

In the Indian legislation notification – Hazardous Wastes (Management, Handling and Transboundary Movements) Rules, 2008, the procedure for handling and storage of hazardous wastes is established.

In Chapter II (Procedure for Handling Hazardous Wastes),

Article 5 (Grant of Authorization for Handling Hazardous Wastes) states:

(1) "Every person who is engaged in generation, processing, treatment, package, storage, transportation, use, collection, destruction, conversion, offering for sale, transfer or the like of the hazardous waste shall require to obtain an authorization from the State Pollution Control Board"

(2) "The hazardous waste shall be collected, treated, re-cycled, re-processed, stored or disposed of only in such facilities as may be authorized by the State Pollution Control Board for the purpose.

Article 7 (Storage of Hazardous Waste) states:

"The occupiers, recyclers, re-processors re-users and operators of facilities may store the hazardous wastes for a period not exceeding ninety days and shall maintain a record of sale, transfer, storage recycling and reprocessing of such wastes and make these records available for inspection:

Provided that the State Pollution Control Board may extend the said period in following cases, namely:

i) small generators up to ten tones per annum;

ii) recyclers, re-processors and facility operators up to six months of their annual capacity;

iii) generators who do not have access to any Treatment, Storage, Disposal Facility in the concerned State; or

iv) the waste which needs to be specifically stored for development of a process for its recycling, reuse"

Among other obligations in the Hazardous Wastes Rules, 2008,

Chapter VI (Packaging, Labeling and Transport of Hazardous Waste),

Article 19 (Packaging and Labeling) states:

1) The occupier or operator of the Treatment, Storage and Disposal Facility or recycler shall ensure that the hazardous waste are packaged and labeled, based on the composition in a manner suitable for safe handling, storage and transport as per the guidelines issued by the Central Pollution Control Board from time to time.

2) *The labeling and packaging shall be easily visible and be able to withstand physical conditions and climatic factors.*

3. INTERNATIONAL REGULATIONS ON PCBS STORAGE

3.1. THE USA CFR 761

The TSCA regulations in 40 CFR Part 761 distinguishes between two types of storage:

a. Storage for use or reuse:

   Storage for reuse deals with PCBs containing equipment awaiting installation, servicing, repair, refilling, used as a spare or replacement, or emergency use

b. Storage for disposal:

   Storage for disposal deals with PCBs waste and PCBs containing equipment that is unfit for service, unauthorized for servicing or use, considered or declared a waste, or destined for disposal.

The TSCA regulation states:

Any PCB waste shall be disposed of within one year from the date it was determined to be a PCB waste and the decision was made to dispose it.

3.2. EU DIRECTIVE ON PCBS

The EU directive on PCBs does not contain any specific provision for the safe storage of PCBs. It requires that the Member States shall individually or jointly take the necessary measures to develop installation for the disposal, decontamination and safe storage of PCBs.

Therefore, the safe storage of PCBs equipment is regulated under each Member States' legislation, whilst at EU level, the storage of PCBs is regulated under the legislation on hazardous waste.

3.3. BASEL CONVENTION

The "Updated general technical guidelines for the environmentally sound management of wastes consisting of, containing or contaminated with persistent organic pollutants (POPs)" establishes

Under Section B (Legislative and regulatory Framework),

Article 3 (Specifications for containers, equipment, bulk containers and storage sites containing POPs):

"To meet the requirements of ESM and specific clauses in the Basel and Stockholm conventions (for example, Basel Convention Article 4, paragraph 7, and Stockholm Convention article 6, paragraph 1), Parties may need to enact specific legislation that describes the types of containers and storage areas that are acceptable for particular POPs. Parties should ensure that containers that may be transported to another country meet international standards such as those established by the International Air Transport Association (IATA), the International Maritime Organization (IMO) and the International Organization for Standardization (ISO)."

The technical specification on the safe storage of POPs containing waste is provided under section F (Handling, collection, packaging, labelling, transportation and storage) of the same guidance document, (reported as Annex I in this document).

It is important to note that the guidelines issued under the Basel Convention concern only PCBs containing waste. Specific guidelines for PCBs containing or contaminated equipment which is not waste (for instance, online equipment or equipment stored pending installation or maintenance) is not covered under the Basel Convention.

4. SITE SELECTION

For storing the PCBs waste, site selection plays an important role. PCBs are hazardous and cannot be stored anywhere. While selecting the site for the establishment of PCBs storage facility, the logistics, infrastructural, environmental and permitting aspects have to be taken in to consideration.

Logistic aspects:

a. The distance of the storage facility from the PCBs waste generation site

b. Transportation cost

c. Well maintained transport infrastructure

Infrastructure and utilities:

Depending on the size of the storage facility, the availability of industrial and portable water, electricity and infrastructures must be ensured.

Environmental aspects:

The impact of the storage facility on the environment and natural events (floods, storm, lightning, earthquakes, atmospheric precipitation, etc.) plays a vital role in the selection of site.

Permitting considerations:

While selecting the site for the establishment of the storage facility, the following permitting factors have to be considered:

The PCBs storage facilities should

- Be at least 200m away from the nearest surface water body;
- Be built on surfaces where the groundwater depth is at least 3m, preferably clay impermeable soil over fractured rocks;
- Never be placed close to populated or sensitive areas;
- Never be placed in areas subjected to fire risk (fuel deposit, high temperature processes, etc.);
- Never be placed in protected areas like natural parks.

Public consultation and public perception:

The involvement of public by means of formal public consultation and proper awareness raising campaign starting from the early stages of the project is recommended.

5. TECHNICAL REQUIREMENTS FOR PCBS STORAGE FACILITIES

5.1. SIZE / CAPACITY

Larger the size of PCBs storage, greater is the risk associated with the infrastructure. Hence, the need for minimized storage facility arises. This can be achieved by managing the complete PCBs cycle by reducing the storage time of PCBs.

In most cases, the need to set up multiple temporary storage sites close to the site of origin of PCBs contaminated equipment arises, which has to be well maintained and

regularly inspected. The storage of PCBs is not only a matter of designing the facility but also of developing a logistic system.

The overall storage capacity should be established by the demand / offer rule:

- Demand: Based on the PCBs generation, the storage capacity depends on the amount of PCBs which is already available for disposal and the amount of PCBs which will be disposed over a certain period of time;
- Offer: Based on the PCBs disposal, the storage capacity depends on the amount of PCBs which may be disposed over a certain period of time.

Centralized storage:-

The size of the centralized storage depends on:

a) The disposal capacity of the plant and;

b) The need to ensure continuous running of the facility. For instance, for a De-Halogenation plant with a capacity of 2t PCB oil/day, the storage could be designed assuming 2 months of continuous operation (120 tons of PCB oil, or up to 360 tons of PCBs transformers).

Distributed storages close to the PCBs source:-

Storages close to the PCBs owners' facilities should accommodate all the PCBs which are ready for disposal and envisage an additional capacity for PCBs equipment which are planned to be disposed of over a certain period of time. The purpose of the distributed storage is to reduce the risk associated with improper storage of PCBs locally, by accommodating (in an environmentally sound manner) a temporary storage for PCBs containing equipment or PCBs waste which are already ready for disposal. For instance: if, at a transformer substation, 20 tonnes of PCBs transformers (already offline) are to be disposed, and a plan for replacing a further 10 tonnes / year of PCBs containing transformer exists in that facility, then the size of the PCBs storage should be designed to immediately accommodate 20 tonnes of PCBs contained transformer plus an additional room for the storage of the 10 tonnes of PCBs which will be placed offline in a period of one year.

5.2. MITIGATION OF ENVIRONMENTAL IMPACTS

5.2.1. PREVENTION OF LEAKAGE

Leakage from stored PCBs equipment could result in harmful effects to humans and the environment. To prevent such leakages, the following points should be considered:

- The storage facility should be built over a layer of impermeable soil (permeability coefficient smaller than $1x10^{-9}$ ms-1, with a thickness of at least 1m).
- The groundwater surface should always be below a depth greater than 3m from the ground surface.
- The floor of the storage facility should be constructed of continuous, smooth and impervious materials, such as Portland cement, concrete or steel, to prevent or minimize infiltration of PCBs.
- Each area, where PCBs containing equipment is stored, should be surrounded by impermeable curbs. The volume of the curbed area from the floor to the top of the curbs should be equal to at least 2 times the volume of the liquid PCBs contained in the biggest equipment, or 25% of the total internal volume of the stored equipment, whichever is greater. In each storage area, absorption material (sawdust bags or similar) capable of absorbing at least the amount of PCBs contained in the biggest equipment should be made available at any given time.
- Areas for the storage of equipment, barrels or tanks containing liquid PCBs should be compartmentalized to avoid the spread of PCBs over the whole storage area in case of leakage or spilling.
- Equipment or barrels containing liquid PCBs should never be stored at a height greater than that of the curbs.
- Barrels or tanks containing liquid PCBs or PCBs contaminated oil should be in good shape and without any presence of rust or damage.
- Any equipment which is in a bad shape, rusty or possibly leaking should be drained before being stored and the drained oil should be placed in barrels.

- To prevent PCBs from entering the environment, in case of spilling or leakage, no pipes, ditches or draining activity of any type should be carried out within the curbed areas of storage facility.
- Barrels should not be stacked for more than two layers.
- The storage unit should be at least covered by a roof for preventing rainwater from hitting the stored material. Usually, long term storage sites are closed buildings, whereas, short term storage sites built near the PCBs sources (for example, within a transformer substation) are open buildings covered by roof.

5.2.2. INDOOR AIR QUALITY

Another important parameter to be considered is the indoor air quality since the storage of PCBs depends on pressure and temperature.

- Closed PCBs Storage facilities (especially, stored PCBs contaminated soil) should be maintained under negative pressure to prevent build-up of dust contaminated by PCBs.
- Negative pressure should be ensured by a draft fan which allows an air turnover of at least one turnover of the internal volume for every 2 hours, when the workers are inside the storage facility.
- The air from the draft fan should be treated by means of fabric filters and activated carbon filters before being released in to the environment. To save energy in cold climate, the air can be re-circulated in to the building after purification.
- In case of fire, the negative pressure system described above could present as a source of air which could further sustain fire, resulting in an even more dangerous condition. Hence, this system should be automatically shut down in case of fire, and all the air inlets should be completely closed / sealed.

5.2.3. OCCUPATIONAL SAFETY AND PPE

While performing operations like packaging or handling of contaminated equipment or waste in PCBs storage sites, the following PPE or equivalent should be used:

- Chemical protective clothing provides protection to the full body against airborne solid particulates (Type 5 protective clothing in compliance with EN ISO 13982-1) and filtering half masks / filtering face pieces (in compliance with EN 149, Class FFP2 and FFP3 or EN 143, Class P2 and P3) while moving or packaging PCBs contaminated soil;
- Disposable protective clothing (in compliance with EN 14605 Type – 3: Liquid tight protective overalls, EN 14605 Type – 4: Spray tight protective overalls, EN ISO 13982-1) provides additional protection to the full body against liquid chemicals / aerosols and mask equipped with anti-dust filters and filters against gas / vapors (in compliance with EN 149 Class FFP2 and A-1 class filter) while draining or filling barrels with PCBs and packaging PCBs capacitors and transformers
- Safety goggles
- Heavy duty rubber gloves (neoprene or butyl)
- Reinforced safety shoes
- Overshoes
- Helmet

The personnel should always wear proper PPE when working inside the PCBs storage facility. PPE should always be removed before leaving the storage facility and entering the general environment or public buildings. Therefore, storage facilities should always include an area dedicated to the wearing and putting off of the PPEs.

Workers in-charge of operations in the storage facility should pass a health check before starting their assignment at the PCBs storage sites, and subsequently at least once per year. These tests should include: hepatic functionality; functionality of the endocrine system; functionality of the immune system; checking for epidermal irritation or anomalies. Protection of the workers' privacy with reference to the results from medical check-up and the adoption of severe countermeasures to avoid misuse of medical data should be established.

5.3. EMERGENCY PLANNING AND PREVENTION

5.3.1. FIRE

PCBs exposed to fire may generate smoke and fumes highly contaminated by PCDD/F and PCBs. Pure PCBs are usually not flammable, whereas PCBs contaminated oil is flammable and dangerous.

Fire prevention system should be established at every PCBs storage site. Fire prevention should be both passive and active.

Passive prevention system includes avoiding PCBs being exposed to any source of fire or heat; compartmentalizing the storage to ensure that in case of fire each compartment is insulated and air is not available to sustain fire; ensuring complete insulation of all the rooms where PCBs waste is stored by switching off any air circulation system and closing all the air inlets.

Active prevention system includes the availability of fire extinguisher at proper places within the storage facility, and in close vicinity of all flammable material. Fire extinguisher of proper class and size (for instance, ABC dry powder extinguishers, 35 kg type) should be used. Fire extinguisher should be properly signaled.

The fire protection system should also include safe evacuation rules and paths, fire protection signs, fire protection safety warning system, fire-retardant covering for the walls and roof of the main building, and the applicable fire-retardant coatings for the steel structure.

5.3.2. FLOODS

Large PCBs storage facilities should never be located within areas subjected to floods. A safe rule should be to establish storage sites outside (above) the areas of recurrence of flood. This rule may be hard to be fulfilled in case of small PCB storage sites located near the PCBs source. The following countermeasures should be adopted in areas (subjected to floods), where small PCBs storage sites are located:

- Ensure that the drums and other containers containing PCBs are closed, sturdy and leak-proof.
- Secure containers to floor or walls by proper retaining systems.

- Place containers in appropriate storage locations. They should not be placed in lower areas such as basements.
- Ensure that all the containers and PCBs containing equipment are clearly labeled with indestructible labels.

5.3.3. EARTHQUAKES

Storage facilities should be built in compliance with the anti-seismic standards in force in the area.

5.3.4. LEAKAGE

If spill, leakage, or similar emergency accident occurs, emergency measures should be carried out to control pollution. Spill or leakage should be enclosed, blocked, and contained immediately, and the spilled or leaked waste fluid (oil or water) should be absorbed by suitable materials. All the waste fluid (oil or water) spilled or leaked should not be allowed to run out from the storage building or discharge in to the environment. These waste fluids should be collected for treatment and measures should be taken to prevent surface water and ground water from getting polluted by PCBs.

5.4. MONITORING AND SITE INSPECTION

5.4.1. SITE INSPECTION

Site inspection should be performed regularly.

1) The following should be inspected weekly:

   a) Condition of all the stored PCBs equipment and containers, with specific reference to any damage, formation of dust, cracks, leaks;

   b) Functionality of all the alarm and fire suppression systems;

   c) General condition of the fencing and external signaling, with special reference to any evidence of vandalism or attempted intrusion.

2) The following should be checked at least monthly:

   a) Condition of the impermeable floor and curbs for any cracks or damage (for instance, by the operation of vehicle inside the building)

   b) Availability and condition of the absorbing material

   c) General condition of the building, including the functionality of the electrical system.

5.4.2. INDOOR MONITORING

- Sampling and analysis of indoor air (VOC, PCBs and chlorine) and dust (total particulate and PM10) inside the storage facility should be performed at least twice per year to ensure that PCBs are stored in a proper way without any risk to the environment.
- Indirect online monitoring of PCBs and other organic compounds by means of VOC and chlorine sensors should be carried out in closed PCB storage facilities.

5.4.3. ENVIRONMENTAL MONITORING

- Sampling and analysis of soil and atmosphere in the vicinity of the storage facility should be performed at least once a year. The following should be measured:
  - PCBs in the soil in at least 4 key places near the PCB storage plant, at surface level and at a depth of 25cm from the soil surface;
  - PCBs in the ambient air and at the outlet of the air purification system.
- The methodological analysis adopted should allow the measurement of the most significant PCBs isomers, including dioxin like isomers.

5.5. DESIGN CONSIDERATIONS FOR A CENTRALIZED PCBS STORAGE FACILITY

5.5.1. GENERAL LAYOUT

The PCBs storage site should include the following areas:

1) Waste acceptance facility;
2) Loading and unloading areas;
3) Workshop for the dismantling / draining of PCBs containing equipment;
4) Compartmentalized storage for equipment or tanks containing pure PCBs;
5) Compartmentalized storage for equipment or tanks containing PCB contaminated oil;
6) Storage area for PCB contaminated solid waste;
7) Storage area for solid non-PCBs material which may be considered as “end of waste”, like reclaimed carcasses, metal sheets, uncontaminated electrical component dismantled from PCBs equipment, etc.

The storage unit / plant should be a closed warehouse with doors of sufficient size to allow trucks to enter the storage building. The entire area should be fenced, surveyed and clearly marked with warning signs.

5.5.2. WASTE ACCEPTANCE FACILITIES

Large, centralized storage facilities:

Large storage facilities receiving PCBs from other areas should establish a dedicated system (staff and infrastructures) for waste acceptance. This system should carry out the following tasks:

- Inspect, weigh and analyze PCBs waste brought to the storage facility;
- Fill the relevant hazardous waste manifest form to be returned to the PCBs owner.

Waste acceptance facility should therefore include:

- A temporary area where wastes being accepted should be temporarily stored, or where trucks transporting PCBs waste should be parked before unloading;
- Scales for weighing trucks and equipment;
- A computerized database of the PCBs waste and equipment entering and being stored in the PCB storage facility;
- Laboratory equipment for sampling and testing for PCBs in the dielectric oil and other matrixes.

Small storage facilities:

Small storage facilities located inside the factories or facilities, which receive and store PCBs only from the factory or facility where they are located; do not require to carry out the procedure for hazardous waste manifest, as this procedure is intended only for the transportation of waste by public roads. However, if these facilities accept PCBs waste coming from other areas or industries, they must put in place the same waste acceptance procedure as described for the large PCBs storage facilities.

5.5.3. WASTE RECORD KEEPING

In any case, PCBs equipment stored must be properly labeled and registered. For any PCBs equipment or waste accepted for storage, the data reported in the hazardous waste manifest form should be recorded on a computerized database. In addition, the data provided by the PCBs owner responsible for delivering the equipment or waste should be also recorded

5.5.4. LOADING AND UNLOADING AREAS

The loading and unloading areas should be equipped with a moving crane which will be used to swing and carry the wastes in the storage building. According to the weight and volume of the hazardous wastes, the crane should have a lifting capacity of at least 10 tonnes since the biggest transformer could weigh several tonnes.

A fork lift truck to unload and carry PCBs wastes in the storage building with a lifting capacity of 2 tonnes should be available at the site. There should be a path at least 4 m wide for the fork lift truck to move.

5.5.5. EQUIPMENT DRAINING AND DISMANTLING AREAS

All draining or dismantling of PCBs contaminated equipment should be carried out in the dedicated draining and dismantling areas. Transformers containing PCBs contaminated oil or pure PCBs shall be drained over impermeable platform where any leakage may be intercepted and promptly recovered. The draining and dismantling area should be well equipped with tools, draining pumps, tanks, etc.

5.5.6. WASTE PRE-TREATMENT AREAS

Depending on the type of pre-treatment, special areas need to be arranged as follows:

- Area for shredding of PCBs containing equipment (capacitors);
- Area for mixing PCBs containing waste with other hazardous waste.

These areas should be arranged to prevent the specific risk involved with the equipment used and the materials processed.

5.5.7. WASTE STORAGE AREAS

The waste storage area should be arranged in the following sub-areas:

Waste containing liquid PCBs:

These wastes should be stored by adopting suitable countermeasures which are aimed at preventing leakage of/from:

- PCBs contaminated oil
- Pure PCBs oil
- Clean or decontaminated dielectric oil
- Transformers
- Capacitors

Waste contaminated by PCBs, but not containing liquid PCBs:

Drained transformers and other solid wastes should be stored in a metallic container or barrels and placed on a concrete platform.

- Drained transformers and transformer components;
- Used tools and PPE wastes;
- Non-metallic PCBs contaminated waste, like insulating paper, wood, etc.

5.6. SITE CLOSURE

At the end of its operational life, the entire PCBs storage facility has to be decontaminated prior to be reused for other purposes. Depending on the level of contamination and the size of the storage facility, it would be convenient to proceed towards complete demolition of the site instead of its clean-up. Demolition or cleanup costs for the PCBs storage facility should always be included in the calculation of investment and operational cost of that facility.

5.6.1. CLEAN-UP OF PCBS STORAGE FACILITIES

The clean-up of the PCBs storage facility should be carried out based on the following steps:

1) Mapping of the PCBs storage facility compartments based on the expected level of contamination. In general, the expected order of contamination is as follows:

   - Pre-treatment and dismantling areas;
   - Draining areas;
   - Loading and unloading areas;
   - Storage of PCBs contaminated materials;
   - Storage of closed tanks;
   - External areas

   The above ranking / ordering is based on the history of the site (for instance, change in the use of certain storage compartments, leakage episodes, other accidents).

2) Sampling and analysis of each area of the compartment to confirm the level of contamination, when necessary.

3) Drafting of a clean-up plan: The clean-up plans should be arranged in such way to avoid cross-contamination between low and high PCBs contaminated areas. The clean-up plan should contain:

- Arrangement of PPEs and emergency measures;
- Cleaning of equipment: For instance, shredding equipment should be cleaned by operating it with non-contaminated material, which subsequently becomes a waste, and by cleansing with non-contaminated oil; tools used for dismantling transformers should be cleaned with solvents; empty tanks should be repeatedly rinsed / sprayed with clean oil and solvents;
- Cleaning of surfaces: Dust should be removed and collected from all surfaces; impermeable surfaces should be cleaned with solvents or surfactants;
- Concrete which has been contaminated by PCBs should be either washed with solvents and subsequently by absorbing material, further coated with additional impermeable layers, or scrapped.
- Collection and packaging: All the contaminated waste and other materials (solvents, oil, sand, sawdust) and PPEs used for cleaning the site should be classified and stored in one of the PCBs storage compartment, and disposed by an appropriate disposal technology as soon as possible. After removal of these wastes, a final round of cleaning of this storage compartment will be carried out.

1) Conduction of the clean-up plan
2) Sampling and monitoring with the desired level of clean-up for final compliance check by relevant authorities.

5.6.2. DEMOLISHING OF STORAGE FACILITIES

In some cases (small PCBs storage site, PCBs storage site heavily contaminated, permitting conditions requiring the dismantling of the storage facility after use) it becomes necessary to demolish the whole facility instead of carrying out the clean-up procedure for the reuse of the site. In such cases, it is recommended to conduct the demolition activity in the following order:

- Clean-up activity aimed at removing all the highly contaminated waste, on the basis of the same procedure depicted in point 5.6.1;
- Removal of medium / low contaminated waste (for instance, concrete platforms, soil from the loading / unloading areas, etc.);
- The facility should be dismantled only after all the waste removed during its clean-up has been disposed;
- Disposal of all demolished material;
- Final monitoring.

6. TRAINING

Training the operators of the PCBs storage sites should include the following issues:

- Basics of the International and National legislations on PCBs
- Basics of the PCBs toxicology and ecotoxicology
- Use of PPEs: respiratory masks, protective suits, method of wearing and removal of PPEs
- Method of handling PCBs contaminated equipment
- Labeling and inventory of PCBs
- Packaging of PCBs equipment
- Procedures related to the hazardous waste manifest
- Emergency procedures: leakage, fire, floods, earthquake
- First aid in case of contamination by PCBs.
- Use of fast screening kits for the detection of PCBs in dielectric oil and soil

Training should be conducted by specialized and independent staff, repeated yearly and verified by appropriate tests

7. ANNEX I: TECHNICAL SPECIFICATION FOR THE SAFE STORAGE OF POPS UNDER THE BASEL CONVENTION

1) *Wastes consisting of, containing or contaminated with POPs should be stored safely, preferably in dedicated areas away from other materials and wastes. Storage areas should be designed to prevent the release of POPs to the environment by any route. Storage rooms, areas or buildings should be designed by professionals with expertise in the fields of structural design, waste management and occupational health and safety or can be purchased in prefabricated form from reputable suppliers.*

2) *Some basic principles of safe storage of wastes consisting of, containing or contaminated with POPs are as follows:*

   a) *Storage sites inside multi-purpose buildings should be in a locked dedicated room or partition that is not in an area of high use;*

   b) *Outdoor dedicated storage buildings or containers (shipping containers) should be stored inside a lockable fenced enclosure;*

   c) *Separate storage areas, rooms or buildings should be used for each type of POPs waste, unless specific approval has been given for joint storage;*

   d) *Such wastes should not be stored at or near sensitive sites such as hospitals or other medical care facilities, schools, residences, food processing facilities, animal feed storage or processing facilities, agricultural operations, or facilities located near or within environmentally sensitive sites;*

   e) *Storage rooms, buildings and containers should be located and maintained in conditions that will minimize volatilization, including cool temperatures, reflective roofs and sidings, a shaded location, etc. When possible, particularly in warmer climates, storage rooms and buildings should be maintained under negative pressure with exhaust gases vented through carbon filters, bearing in mind the following conditions:*

      i) *Ventilating a site with carbon filtration of exhaust gases may be appropriate when exposure to vapours for those who work at the site and those living and working in the vicinity of the site is a concern;*

      ii) *Sealing and venting a site so that only well-filtered exhaust gases are released to outside air may be appropriate when environmental concerns are paramount;*

f) Dedicated buildings or containers should be in good condition and made of hard plastic or metal, not wood, fibreboard, drywall, plaster or insulation;

g) The roofs of dedicated buildings or containers and the surrounding land should be sloped to provide drainage away from the site;

h) Dedicated buildings or containers should be set on asphalt, concrete or durable (e.g., 6 mm) plastic sheeting;

i) The floors of storage sites inside buildings should be concrete or durable (e.g., 6 mm plastic sheeting). Concrete should be coated with a durable epoxy polymer;

j) Storage sites should have fire alarm systems;

k) Storage sites inside buildings should have (preferably non-water) fire suppression systems. If the fire suppressant is water, then the floor of the storage room should be curbed and the floor drainage system should not lead to the sewer or storm sewer or directly to surface water but should have its own collection system, such as a sump;

l) Liquid wastes should be placed in containment trays or a curbed, leak-proof area. The liquid containment volume should be at least 125 per cent of the liquid waste volume, taking into account the space taken up by stored items in the containment area;

m) Contaminated solids should be stored in sealed containers such as barrels or pails, steel waste containers (logger boxes) or in specially constructed trays or containers. Large volumes of material may be stored in bulk in dedicated shipping containers, buildings or vaults so long as they meet the safety and security requirements as described herein;

n) A complete inventory of such wastes in the storage site should be created and kept up to date as waste is added or disposed of;

o) The outside of the storage site should be labelled as a waste storage site;

p) The site should be subjected to routine inspection for leaks, degradation of container materials, vandalism, integrity of fire alarms and fire suppression systems and general status of the site.