

**REPORT**

**National Regulators Meet  
On Mercury Convention**

**30<sup>th</sup> December 2013**

**Deck Suite, India Habitat Centre  
New Delhi**

**ORGANISED BY**



**Toxics Link**  
for a toxics-free world



## CONTENT

1. BACKGROUND

2. CONFERENCE REPORT

3. CONFERENCE PRESENTATIONS (PRESENTATIONS)

4. CONFERENCE IN VISUALS

5. CONFERENCE AGENDA

## **BACKGROUND**

Minamata Convention on Mercury was adopted on 10 October 2013 at the Conference of Plenipotentiaries (Diplomatic Conference) in Kumamoto, Japan. Since its adoption, 93 countries have signed the treaty which will come into effect after a gap of 90 days post its ratification by 50 countries.

Mercury is widely used in various products in India. At present there is no restriction on the import and use of mercury in India. As Minamata convention will have far reaching impacts on the regulations of mercury, the role of regulators were critical important to understand and examine all aspects of the convention and its resultant impact on environmental governance.

In this context, Toxics Link in association with the Central Pollution Control Board (CPCB) organized a one day regulators meet at India Habitat Center, New Delhi on 30<sup>th</sup> December 2013 to get a better understanding of the convention and the role of the concerned institutions in shaping the future actions and responsibilities.

## INAUGURAL SESSION

**Mr. Satish Sinha**, Associate Director, Toxics Link briefed the gathering on the Minamata Convention on Mercury and defined the objective of the conference which was to gain a clear understanding of the newly adopted mercury convention. He also stressed on the need to understand and discuss the steps to be taken by the Government of India, Central Pollution Control Board and the National Governmental Organizations.

While the convention has been signed by 94 countries, India is yet to sign the convention. The United State of America was the first country to ratify the convention.

Toxics Link has been working on mercury issues since 2001, informed Mr. Sinha. The organization was a part of the negotiation process in INC since the negotiation started.

Speaking about the role of CPCB in the negotiation and intergovernmental discussion during the Minamata Convention, **Mrs. Meeta Sharma**, Additional Director and head of Coordination Cell of the Central Pollution Control Board informed that 5 INCs were held before the convention became a legally binding instrument. It focused on health and environment and mercury management. The convention largely focused on elemental mercury, mercury compounds and mercury added products. Giving a brief insight into the Annexure A, B, C & D and appendix of the Minamata Convention, Mrs. Sharma informed that India has taken some serious steps to reduce mercury usages in various products.

In 2003 CPCB had issued a charter on corporate responsibility on environmental protection. By the time the first INC meeting was held in 2009, CPCB had already come out with biomedical waste guidelines.

Annex A includes a list of mercury added products (manufactured, imported or exported) which shall not be allowed after 2020. CFLs contain mercury. CPCB is stressing upon shifting from CFLs to LEDs, she added. Technical guidelines were introduced by CPCB in 2008-2009 on fluorescent lights. Annex A lists out mercury added products such as clinical thermometers, blood pressure instrument etc. in which the government has taken a lead in phasing out and shifting to mercury free clinical instruments.

Annex B includes manufacturing processes in which mercury or mercury compounds are used. Chloralkali production is to be phase out by 2025 and that of acetyldehyde by 2018, the additional director CPCB informed.

Mrs. Sharma revealed that as per the Chloralkali manufacture association, 97% of conversion from mercury cell to mercury free membrane cell technology has already taken place. India is the only country leading ahead compared to Japan and USA in converting to mercury free process in chloralkali industry. Other sectors under Annex B are acetaldehyde production, vinyl chloride monomer production, production of polyurethane, sodium/potassium methylate or ethylate. Annex C include artisanal and small-scale gold mining.

She said that Minamata Convention focuses more on emissions of mercury rather than its release. The convention mentions that release includes release of mercury into water and land and emissions include discharge into the atmosphere.

Annex D focuses on emissions of mercury and its compounds to the atmosphere. The sectors emitting mercury are coal fired power plants, coal fired industrial boilers, smelting and roasting process in the production of non-ferrous metals, waste incinerator facilities and cement clinker production facilities. According to Mrs. Sharma, the thrust of Minamata should be on elemental mercury rather than mercury containing compounds.

Mrs. Sharma reiterated that industries have shifted from subcritical to super critical to ultra super critical technologies and CPCB have integrated gasification combined cycle to reduce the carbon foot print. In India, thermal power plants have not reached maturation/lifetime, thus it is possible to shift towards advanced technology. The discussions should be on viability and not on technologies, she added. For signing the Minamata treaty, CPCB needs to have a complete database on the issue.

## **Technical session**

**Mr. R.N. Jindal** (Additional Director, Ministry of Environment and Forests, Govt of India) briefed about Minamata Convention and explained in detail about the INCs meetings and the negotiations process during these meetings. Two resolutions took place in the INC meeting held in January 2013 in Geneva, these were: text of the convention and the interim period.

Elaborating on Article 8, 9, 14 and 18 as well as the research, development and monitoring part of the convention, Mr. Jindal said that the financial arrangements were also an issue. The treaty states that for reducing the supply of mercury, no new mining should be allowed, complete data of import-export of mercury and mercury containing compounds should be maintained. The treaty also bans the establishment of new mercury production industries He pointed out that article "8" explained about emissions and article 9 about release of mercury in the environment. Mr Jindal informed that more than 90% mercury used gets wasted or released into the environment.

The Japanese Government has technologies to control emission but not for controlling release of mercury and its compounds in the environment. Mercury used in research work and traditional use as medicines etc. are not covered under Minamata Convention. There is a provision of environmentally sound interim storage of mercury and party shall not allow transportation of mercury until the exporting party provides consent for the same. He further shared that small scale gold mining is prevalent in African countries but not in India.

**Mrs. Ajeeta Dayal** from Delhi Pollution Control Committee wanted to know how to control the mercury release if technologies are not available. To this Mr. Jindal replied that according to Article 2, there are Best Available Technologies (BATs) & Best Environmental Practices (BEPs) which are applicable to the parties of the convention. If technologies are not there to control/reduce release of mercury then the party is required to develop it. He mentioned a study by UNEP on Indian coal which estimates mercury quantity to be 0.9 distribution factor while the data by the government of India from six coal mines states it to be 0.58 distribution factor (explain distribution factor). India is importing and mining coal. According to the UNEP report, insufficient burning of coal results in ash with more carbon and higher mercury. Activated carbon is used to bind the mercury and control its release but there is no information available on activated carbon. He further mentioned that mercury based instruments are more accurate and digital instruments have issues as they work on battery.

Responding to **Dr. D.K. Behera's** query on the provision of keeping inventory under Minamata Convention, which India will prepare the same under NIP, Mr. Jindal replied that one of the intentional mercury uses around the world is in chloralkali plant. Provision for reducing mercury in chloralkali industry is for 2025. However, India has already reduced it to zero. It is pertinent to understand the need to handle mercury waste, contaminated sites and financial resources. There are no specific funds available but some mechanisms are available through GEF (Global Environment Fund), capacity building, technical assistance and technology transfer.

Mr. Jindal informed that the Government of India is working on reducing mercury emissions from relevant sources; emission limit value is to be there, applicability of the BAT & BEP, a multi pollutant controlling strategy which will co-benefit for control of mercury emission. In coal sector, mercury can be reduced or controlled by using benefitted coal. However, there is a need for standards for mercury in cement and power sector.

Mr. Sinha from Toxics Link cleared that the essence of whole convention is reduction of mercury. However, the issue is how far we can reduce demand of mercury so that it will minimize contamination of the environment. He informed the gathering that only those

products are included in the treaty where alternatives are available and it is possible to transit in the specified time limit. In cases where alternatives are not available, like thiomersal in vaccines, these have been excluded from the treaty.

Mrs. Meeta Sharma informed that in the next financial year, CPCB will look into each sector where mercury is used and prepare the inventory. She further added that there is a need to increase energy production and at the same time reduce emissions.

Continuing the session, Mr. Jindal told that being a part of legally binding instrument/convention India has to go through the scenario available and what others are doing to control under the Minamata convention. Power plants exist around the world which uses coal, yet they are emitting less mercury. India should also follow such technology, especially when in our study in Indian coal, output standing distribution factor was found to be 0.583. Technologies are available to control mercury emission but they are not free of cost. Tough negotiations are on at a global platform.

**Dr. Manoranjan Hota** (Director, Ministry of Environment and Forests, Govt. of India) made the presentation on “Environmentally Sound Interim storage of Mercury and other waste mercury, contaminated sites, and Financial Resources and Mechanism covered under Minamata Convention”. He began briefing about negotiations and process of formation of Minamata Convention. There were 140 countries involved in the treaty - signatory or observant. These countries are divided into groups and subgroups. India comes under Asia Pacific group which is a heterogeneous group and includes both developed as well as developing countries.

He explained that many issues are not clear like the source, reliability, cost effectiveness and manufacturer of technologies available. Similarly mercury disposal method is not clear. He added that guidelines are needed to develop on waste transportation, storage and treatment. In INC 4, it was agreed upon to go for Basel convention for mercury waste transportation.

Dr. Hota shared that technology transfer is quite costly and is not a part of the treaty. Though multilateral funds like GEF are available but proposal preparation itself is a project which requires lots of expertise and is costly too. World Bank and SIDA are also available for funding but they are not interested in giving funds to small or poor country as its not profitable for them.

To this, Mr. Sinha clarified that right now the funding is not available from GEF too. But Basel, Rotterdam and Minamata Conventions provide funds for inventorization and proposal preparation to any country which needs financial assistance.

Dr. Hota said that the National Implementation Plan (NIP) on mercury management is to be developed as soon as the convention will come into force. The Convention is an international law and it should be followed by India. It is advisory not mandatory. Though an action plan has to be finalized before moving ahead with negotiations on the convention.

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In the next session, **Mr. Satish Sinha** Spoke of the health effects of mercury. He stated that Mercury can have severe effects on children causing low IQ, memory loss etc. The effects are so slow that it is difficult to measure and correlate. The convention becomes operational when 50 countries have ratified it. After 90 days from the last country that signs the convention, it becomes operational. It will take approximately two years time for 50 countries to ratify it, he said. Thus a timeframe till 2020 has been given for most of the cases. Few steps have been taken by developed countries, there are other countries who are planning to achieve the same are given 5 yr time to implement the treaty and 5 yr extension will be provided if it is needed. Second extension will also be available.

Many European chloralkali companies were unable to shift to other technologies. Chlorine is not in much demand. Production process has been shifted. Most of their plants will be out of utility by 2025. China has negotiated vinyl chloride monomer production and gets relief till 2020. China has also got exempted for primary mining of mercury.

Mr. Sinha detailed out the articles 3, 4 & 5 of the Minamata treaty. Article 3 deals with mercury supply sources and trade. The treaty attempts to look at the supply and demand side. Third part of the treaty is emission and release. Supply sides are mercury mines and secondary mercury that generates while processing. No new mine will be allowed now. Only four countries have mercury mining Spain, China, Turkmenistan and Algeria. They will face huge economic fallout, thus specific timeframe have been given. In existing mines, each party shall only allow primary mercury mining that was being conducted within its territory at the date of entry into force of the Convention for it for a period of up to fifteen years. Annex A includes timeline for phasing out mercury added products. Annex B gives timeline for phasing out mercury & mercury compounds industries.

Further surplus mercury cannot become part of supply. This cannot be add to supply chain and has to dispose off. Trade between party and non-party has been detailed out in the treaty. After ratifying the treaty, the country will become a party. The intention of the treaty is to ban the use of mercury. Mercury trading is not only economical but also social issue. For storage the mercury trade is to be allowed as all the countries can't prepare storage facility due to huge



cost and require huge precaution and latest technology. Parameters and guidelines are also very strict for setting up the storage facility.

While answering a query by Mrs. Ajeeta, Mr. Sinha replied that Germany has offered to take the world's mercury and will pit it back in the salt mines. As a nation we require mercury but we are importing and there is no mine in India. The GOI has to list out the mercury based industries of country and has to work out on their demand. After signing the treaty the Ministry will have to come up with NIP, reductive regulations, instructions to control the mercury emission/release. Many of guidelines, standards, monitoring procedures will come out in next Conference of Party (COP) which is scheduled in Bangkok in Nov 2014. Definition and parameter of contaminated sites, monitoring methods and many more work yet to be year marked in the convention.

There are specific time frames for the products in the convention because there are alternatives and countries are even practicing it. That's why the specific time frame is negotiated. Products for which alternatives are not available have not been included in the convention. Due to the lack of data, some of the sectors like natural gas, petroleum industry have been kept out of the purview of the convention. So if there is scientific document on the presence of the mercury it will come out, and fall under the purview of the convention. The issue of CFL was also discussed during the negotiation. Manufacturers are now producing CFL using mercury below 1.5-2.5 microgram ( $\mu\text{g}$ ). Final negotiation came out to be 5  $\mu\text{g}$  mercury for 30 watt CFL. These products are not to be phased out but the suitable alternatives can be promoted. There is no deadline for dental amalgam in the convention.

Focusing on vinyl chloride monomer Mr. Sinha informed that parties have to reduce the use of mercury in terms of per unit production by 50 per cent by the year 2020. The convention will not allow the use of mercury five years after the Conference of the Parties established that mercury-free catalysts based on existing processes have become technically and economically feasible. He informed that India has almost phase out the chloralkali plants. There are only two plants that will also close soon as they have outlived their life. No mercury comes up from these industries as they have recycled it. But if mercury become surplus it can't be circulated but has to be stored.

In his final remarks, he shared that even mercury used in instrument like health care will not be allowed and has to be phased out. Many of these instruments are governed by RHOS law in European Union and there is a restriction of using hazardous materials and now mercury is also part of it.

**Dr. N. S. Dharmshaktu**, Dy. Director; General NSD, Ministry of Health & Family Welfare, Govt .of India explained the major health concerns on mercury exposure. Mercury transformed into methylmercury in water bodies and is more toxic than elemental mercury. According to WHO Guidance values, provisional tolerable weekly intake of methylmercury is 1.6 µg/kg bodyweight per week for fetus. Similarly, WHO estimated a tolerable concentration of 0.2 µg/m<sup>3</sup> for long-term inhalation exposure to elemental mercury vapor, and a tolerable intake of total mercury of 2 µg/kg body weight per day. Symptoms of mercury exposure include tremors, insomnia, memory loss, neuromuscular effects, headaches and cognitive and motor dysfunction.

He informed that dental amalgam is one of the major sources of mercury exposure and there is no deadline for its phasing-out in the convention. . He added that there is a need to promote research and development for quality mercury free material for dental restoration and formation of Implement National Programme for prevention of dental carriers to minimize need for dental restoration. He threw lights on all articles of treaty and also challenges to be faced in implementation of the treaty with respect to items/instruments used in health sector. He further suggested the possible role of health sector in controlling mercury release like use of mercury free instruments, amalgam free dental care, common BMW treatment facilities, reducing mercury in traditional uses as AYSUH, public awareness programme. He also suggested that the role of Ministries should be national assessment of mercury usage and disposal, waste-handling, environmentally sound management of wastes, promotion of long-term monitoring and programmes to reduce occupational exposure. He told that national apex lab and five regional labs for testing of mercury level in human samples should be developed. In the end he said that the food like fish & other water based food should be reviewed by FSSAI and in the soil, water & air mercury contamination should be reviewed by CPCB. Mercury level in biocide, pesticides, insecticides should be reviewed by ICAR.

Mr. Satish Sinha, in his closing remarks, thanked all the speakers and participants and said that everyone has some responsibility. Some amount of commitment is required among the stakeholders as well as the government to phase out the mercury.

**Representatives from thirteen state pollution control board were present in this meet.**

### **3. PRESENTATIONS**

- **Mr. R. N. Jindal, Additional Director,  
Ministry of Environment and Forests, Govt of India**
- **Dr. Manoranjan Hota, Director,  
Ministry of Environment and Forests, Govt. of India**
- **Mr. Satish Sinha.  
Associate Director, Toxics Link**
- **Dr. N. S. Dharamshaktu  
Dy. Director; General (NSD), Ministry of Health & Family Welfare**

**Mr.R.N.Jindal**  
**Additional Director,**  
**Ministry of Environment and Forests , Govt of India**

INTERGOVERNMENTAL NEGOTIATING  
COMMITTEE (INC)

- (UNEP)/25/5 Decision in February 2009
- Mandate: to prepare an international legally binding instrument on mercury
- Comprehensive and suitable approach

INC

- INC 1 was held in Stockholm, Sweden(7 to 11 June 2010)
- INC 2 was held in Chiba, Japan (24 to 28 January 2011)
- INC 3 in Nairobi (31 October to 4 November 2011)
- INC 4 in Punta del Este, Uruguay (27 June to 2 July 2012)
- The 5<sup>th</sup> Meeting of INC to decide the text of a global legally binding instrument on Mercury was held in Geneva, Switzerland during 13 - 18th January 2013.
- INC agreed on the text of a global legally binding instrument, the Minamata Convention on Mercury, for adoption by the Conference of Plenipotentiaries.

- INC-5: Resolutions

- » Text of the Convention
- » arrangements in the interim period;
- » financial arrangements;
- » matters pertaining to other international bodies;
- » tribute to the Government of Japan.

## INC

- Objectives :
  - Reducing Supply of Mercury,
  - Demand of Mercury in Production and Processes
  - To Reduce Atmospheric Emissions of Mercury
  - To Reduce International Trade in Mercury,
  - To Address Mercury Containing Waste and Remediation of Contaminated Sites,
  - To Increase Knowledge, Scientific Information Exchange,
  - Awareness Raising Capacity Building,
  - Technical and Financial Assistance And
  - Enhancing Capacity of Environmentally Sound Storage of Mercury.

- Articles (35):
  - » Objective,
  - » Definitions,
  - » Mercury supply sources and trade,
  - » Mercury-added products,
  - » Manufacturing processes in which mercury or mercury compounds are used,
  - » Exemptions available to a Party upon request,
  - » Artisanal and small-scale gold mining,
  - » **Emissions,**
  - » **Releases,**
  
- » Mercury wastes;
- » Contaminated sites;
- » Financial resources and mechanism;
- » Capacity-building, technical assistance and technology transfer;
- » Implementation and Compliance Committee;
- » Settlement of disputes.

## **Article 8**

### **Emissions**

1. Controlling and, where feasible, reducing emissions of mercury and mercury compounds, often expressed as “total mercury”, from the point sources listed in Annex D
  
2. Measures to control emissions and may prepare a national plan
  
3. Best available techniques and best environmental practices
  
  
  
  
  
  
  
  
  
  
4. One or more of the following measures,
  - (a) A quantified goal
  - (b) Emission limit
  - (c) Use of BAT and BEP;
  - (d) A multi-pollutant control strategy;
  - (e) Alternative measures.
  
5. Same/Different measures to all relevant existing sources
  
6. An inventory of emissions from relevant sources.

## **Article 9**

### **Releases**

1. Controlling, reducing releases of mercury and mercury compounds,
2. Identify the relevant point source categories ( within three years).
3. Measures to control releases and a national plan
  
4. The measures (one or more of the following):
  - To control and, reduce releases relevant sources;
  - Best available techniques and best environmental practices;
  - A multi-pollutant control strategy;
  - Alternative measures .
5. An inventory of releases from relevant sources within 5 years
6. Conference of the Parties (CoP) to adopt guidance on:
  - Best available techniques and on best environmental practices
  - The methodology for preparing inventories of releases.



Article 17: Information exchange

Article 18: Public information, awareness and education

Article 19: Research, development and monitoring

**Mr.Satish Sinha  
Associatel Director,  
Toxics Link**

## **About Toxics Link**



Toxics Link is an information outreach and environmental advocacy organization set up in 1996

## **Programme Areas**

### **Chemical and Health**

- Chemicals in Products,
- Lead in Paint Campaign,
- Mercury campaign and
- POPs and Pesticide

### **Waste**

- Biomedical waste,
- Electronic waste,
- Hazardous waste and
- Municipal waste

## **Facts about mercury**



**Neurotoxin  
Global transportation  
Endocrine disruption  
Liver function  
Memory loss  
Cardiovascular  
IQ reduction**

## Chronology of events



2001- Global Mercury assessment

2003- Global assessment considered by UNEP

2005-07 Governing Council Decision to encourage governments to reduce mercury pollution

2009- Governing Council decision 25/5

2010- 13 Intergovernmental committee Meetings

2013 October- Adoption of Minamata treaty

## Article 3: Mercury Supply Sources and Trade



- Addresses issues of mercury supplies
- New Mercury Mining
- Existing Mines: Each Party shall only allow primary mercury mining that was being conducted within its territory at the date of entry into force of the Convention for it for a period of up to fifteen years after that date. Algeria, Spain, China and Kyrgyzstan
- Identify stocks of surplus mercury and disposal of such stocks
- Trade between party and non party.
- Role of COP

## Annexure A

### Mercury-added products

#### Part I: Products subject to Article 4, paragraph 1



*Date after which the manufacture, import or export of the product shall not be allowed (phase-out date)*

#### *Mercury-added products*

- Batteries, except for button zinc silver oxide batteries with a mercury content < 2% and button zinc air batteries with a mercury content < 2% • 2020
- Switches and relays, except very high accuracy capacitance and loss measurement bridges and high frequency radio frequency switches and relays in monitoring and control instruments with a maximum mercury content of 20 mg per bridge, switch or relay • 2020
- Compact fluorescent lamps (CFLs) for general lighting purposes that are ≤ 30 watts with a mercury content exceeding 5 mg per lamp burner • 2020
- Linear fluorescent lamps (LFLs) for general lighting purposes:
  - (a) Triband phosphor < 60 watts with a mercury content exceeding 5 mg per lamp; (b) Halophosphate phosphor ≤ 40 watts with a mercury content exceeding 10 mg per lamp • 2020
- High pressure mercury vapour lamps (HPMV) for general lighting purposes
- Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for electronic displays:
  - (a) short length (≤ 500 mm) with mercury content exceeding 3.5 mg per lamp • 2020
  - (b) medium length (> 500 mm and ≤ 1 500 mm) with mercury content exceeding 5 mg per lamp • 2020
  - (c) long length (> 1 500 mm) with mercury content exceeding 13 mg per lamp

## Annex A



- Cosmetics (with mercury content above 1ppm), including skin lightening soaps and creams, and not including eye area cosmetics where mercury is used as a preservative and no effective and safe substitute preservatives are available<sup>1</sup>/ • 2020
- Pesticides, biocides and topical antiseptics
- The following non-electronic measuring devices except non-electronic measuring devices installed in large-scale equipment or those used for high precision measurement, where no suitable mercury-free alternative is available:
  - (a) barometers;
  - b) hygrometers; (c) manometers; (d) thermometers;
  - (e) sphygmomanometers• 2020

*The intention is not cover cosmetics, soaps or creams with trace contaminants of mercury.*

## Annexure B



### Manufacturing processes in which mercury or mercury compounds are used

#### Part I: Processes subject to Article 5, paragraph 2

- Manufacturing processes using mercury or mercury compounds
  - Chlor-alkali production
  - Acetaldehyde production in which mercury or mercury compounds are used as a catalyst
- **Phase-out date**
  - **2025**
  - **2018**

## Article 4: Mercury-Added Products



1. Each Party shall not allow, by taking appropriate measures, the manufacture, import or export of mercury-added products listed in Part I of Annex A.
2. Alternative plan and strategy.
2. Incorporation in assembled products
2. Exemptions
2. Reporting to COP
2. Amendments to Annex/listing of new products



5. Each Party shall take measures to prevent the incorporation into assembled products of mercury-added products the manufacture, import and export of which are not allowed for it under this Article.

6. Each Party shall discourage the manufacture and the distribution in commerce of Mercury-added products not covered by any known use of mercury-added products prior to the date of entry into force of the Convention for information publicly available

7. Any Party may submit a proposal to the Secretariat for listing a mercury-added product in Annex A, which shall include information related to the availability, technical and economic feasibility and environmental and health risks and benefits of the non-mercury alternatives to the product, taking into account information pursuant to paragraph 4.

8. No later than five years after the date of entry into force of the Convention, the Conference of the Parties shall review Annex A and may consider amendments to that Annex in accordance with Article 27.

## Annexure-B Part II: Processes subject to Article 5, paragraph 3



### Mercury using process

- **Vinyl chloride monomer production**

### Provisions

Measures to be taken by the Parties shall include but not be limited to:

- Reduce the use of mercury in terms of per unit production by 50 per cent by the year 2020 against 2010 use;
- Promoting measures to reduce the reliance on mercury from primary mining;
- Taking measures to reduce emissions and releases of mercury to the environment;
- Supporting research and development in respect of mercury-free catalysts and processes;
- Not allowing the use of mercury five years after the Conference of the Parties has established that mercury-free catalysts based on existing processes have become technically and economically feasible;
- Reporting to the Conference of the Parties on its efforts to develop and/or identify alternatives and phase out mercury use in accordance with Article 21.



## Sodium or Potassium Methylate or Ethylate

Measures to be taken by the Parties shall include but not be limited to:

- i. Measures to reduce the use of mercury aiming at the phase out of this use as fast as possible and within 10 years of the entry into force of the Convention;
- ii. Reduce emissions and releases in terms of per unit production by 50 per cent by 2020 compared to 2010;
- iii. Prohibiting the use of fresh mercury from primary mining;
- iv. Supporting research and development in respect of
- v. mercury-free processes;
- vi. Not allowing the use of mercury five years after the Conference of the Parties has established that mercury-free processes have become technically and economically feasible;
- vii. Reporting to the Conference of the Parties on its efforts to develop and/or identify alternatives and phase out mercury use in accordance with Article 21.



- **Production of polyurethane using mercury containing catalysts**

Measures to be taken by the Parties shall include but not be limited to:

- (i) Taking measures to reduce the use of mercury, aiming at the phase out of this use as fast as possible, within 10 years of the entry into force of the Convention;
- (ii) Taking measures to reduce the reliance on mercury from primary mercury mining;
- (iii) Taking measures to reduce emissions and releases of mercury to the environment;
- (iv) Encouraging research and development in respect of mercury-free catalysts and processes;
- (v) Reporting to the Conference of the Parties on its efforts to develop and/or identify alternatives and phase out mercury use in accordance with Article 21.

Paragraph 6 of Article 5 shall not apply to this manufacturing process.

# Mercury

Dr N.S.Dharmshaktu  
DDG(NSD) , Dte GHS, MOHFW

## Minamata Treaty signed by GOI

- In 1950s when a factory discharged large quantities of a mercury catalyst in to the Minamata Bay 41 deaths occurred & at least 30 cases of profound brain injury in infants born to mothers who ingested contaminated fish during pregnancy were found. Large long lived predatory ocean fish like Tuna, Swordfish, shark have increase methyl mercury content.



## EXPOSURE TO MERCURY: A MAJOR PUBLIC HEALTH CONCERN

- Mercury is **highly toxic** to human health, posing a particular threat to the development of the **child *in utero* and early in life**. It occurs naturally and exists in various forms: ***elemental (or metallic); inorganic (e.g. mercuric chloride); and organic (e.g., methyl- and ethylmercury)***. These forms **all have different toxicities** and implications for health and for measures to prevent exposure. **Elemental mercury is a liquid that vaporizes readily**. It can stay for up to a **year in the atmosphere** .
- It **ultimately settles in** the sediment of lakes, rivers or bays where it is **transformed into methylmercury, absorbed by** phytoplankton, ingested by zooplankton **and fish**, and accumulates especially in **long-lived predatory species, such as shark and swordfish**.

### WHO Guidance Values - Provisional tolerable weekly intake

- **A tolerable intake of 1.6 µg/kg bodyweight per week** for methylmercury in order to protect the developing **fetus** from neurotoxic effects.
- **For adults**, up to about **twice** the tolerable intake per week would not pose any risk of neurotoxicity. This tolerable intake established in 2004 applies also to children up to 17 Yrs as well.
- **WHO Guideline Values:**
- Water: 1 µg/litre for total mercury
- Air: 1 µg/m<sup>3</sup> (annual average)
- WHO estimated a tolerable concentration of 0.2 µg/m<sup>3</sup> for **long-term inhalation exposure** to elemental mercury vapour, and a **tolerable intake** of total mercury of 2 µg/kg body weight per day.

## Health Effects

- **Elemental and methylmercury** are toxic to the **central and peripheral nervous** system. **The inhalation of mercury vapour** can produce harmful effects on the **nervous, digestive and immune systems, lungs and kidneys**, and may be fatal.
- **The inorganic salts of mercury** are corrosive to the skin, eyes and gastrointestinal tract, and may induce **kidney toxicity** if ingested.
- Neurological and behavioural disorders may be observed **after inhalation, ingestion or dermal application** of different mercury compounds. Symptoms include **tremors, insomnia, memory loss, neuromuscular effects, headaches and cognitive and motor dysfunction**.
- Mild subclinical signs of central nervous system toxicity can be seen in **workers exposed to an elemental mercury level in the air of 20µg/m<sup>3</sup> or more for several years**. **Kidney and immune effects** have been reported. There is no conclusive evidence linking mercury exposure to cancer in humans.

### What signing of treaty means

- I. Matter of concern of **Immediate near future** related to items used in health care:
- Many items have to be **phased out by 2020** eg Hg based **spegmomanometer, thermameter** Phase out ( manufacturing import, export shall **not be allowed after 2020** article 4 para 1)
- **Dental Amalgum Article 4 phase down** & no deadline :  
Implement national *programme for prevention of dental caries to minimise need for dental restoration . Promote R & D for quality Hg free material for dental restoration,*  
**Reducing emissions of Hg (article 8) from point source ( Coal Fired plant, Coal fired industrial boilers, smelting, roasting process in production of non ferrous metals, other waste incineration facilities, cement clinker production facilities). waste incineration facilities . modification** of the source causing emission would be required , **emission limit value** would need to be fixed.

- 2. Manufacturing , **import , export** shall not be allowed **beyond 2020** for mercury containing **pesticides, biocides, topical antiseptics**.
- **Cosmetics** with mercury content >1ppm including **Mercury in skin lightening soap** & creams except eye area cosmetics , **batteries** with Hg >2%, **switches & relays** with Hg >20mg/bridge ; **CFL** with Hg >5 mg/lamp burner,, & other types of CFL lamps, have to be **phased out by 2020**.
- 3. **Mercury & its compounds** like **chlor alkali production** to be **stopped by 2025** , **acetaldehyde production** using **mercury as catalyst** to be **stopped by 2018**. R & D has to be initiated to find alternative catalyst.

- *Restriction on import /export of Hg, Hg compounds, controlling/regulating its release value limit, developing natl capacity for proper storage, identification of contamination & contamination site , devt of Natl capacity for management of Hg waste*
- ***Hg wastes Article 11** : Substance consisting of /containing/contaminated with Hg or Hg compounds. Each party will not Transport across international boundary except for purpose of environmentally sound disposal.*
- ***Hg Contaminated site (article 12): Management** includes site assessment, human & envt risk assessment, options for managing the risk , detail evaluation & outcome .*

## What are its implications

- 1. GOI has **issued instructions to central govt hospital & HCs under M/OHFW** for phasing out of mercury containing BP apparatus and thermometer. Direction given to start **procurement** of non mercury eqpt.
- It should also be done by **other central ministries and all states/UTs**, information should also be given to manufacturers , importers of Hg based equipment's.
- Similar guidelines by other ministry/dept like materiology dept for **barometer, hygrometer, manometer** is required as they are to be **phased out by 2020**.
- **4.Measures have to be taken to reduce Mercury** using process for **Vinyl Chloride** monomer production, Sodium potassium Methylate or ethylate, polyurithane production using mercury **as catalyst**.

## Continued

- 5. Mercury content in **Compact FL , linear Fluorescent Lamps for general use & Hg in cold cathode** fluorescent lamp for electronic display to be regulated **by 2020** .
- 6.High pressure mercury vapour lamp for general lighting to be **phased out by 2020**.
- **7. Reducing emissions of Hg (article 8) from point source ( Coal Fired plant, Coal fired industrial boilers, smelting roasting process in production of non ferrous metals, waste incineration facilities, cement clinker production facilities).** *Measuring of emission level & modernisation of equipments would cost more.*

- **Natl Capacity** for Mangt of Hg waste has to be developed.
- Economic impact due to Implication of these will be enormous. Therefore, **a natl policy & plan** has to be developed including monitoring measures required to **control emission** (Article 11), **law** will be required for taking **regulatory** measures.

### **Challenges in implementation of the treaty wrt items used in health**

- 1. Thermometer & BP instrument phasing out started in central govt hospitals under MOHFW & Delhi. Adoption **by states/UTs** & reaching out to **GPs** will take time.
- 2. **Standardization** of non mercury BP apparatus and thermometers.
- 3. Monitoring **Incinerators emission level** and **their modernisation**.
- 4. Ayush Medicine : Preservative used for AYUSH drugs . Ayush Religious use **is questionable** . **Low level of Hg has to be maintained by regulation in view of traditional use.**
- 5. Preservative value as **topical antiseptics, cosmetics** would require regulation for **maintaining low level** of Hg in them.
- 6. Preservative thiomersol in **Quadrivalent vaccine, H1 N1 Influenza vaccine manufactured abroad**. These vaccine supplied to developing countries still contain mercury preservative. Since children are given 3 doses of quadrivalent vaccine and booster intramuscular doses. scientists in US have raised the issue that this vaccine should not contain mercury even in minute quantity.

- ( This item is excluded from Mercury added products Annexure A. But **its early effect needs to be studied in India** in vaccinated children particularly those who have received 3 doses Of quadrivalent Vaccine plus booster doses ).
- 7. Hg **Contamination site identification** and **measuring its effect** on human population would need **detailed epidemiological study** to find out **early subclinical signs**, to rule out other factors.
- 8. A comprehensive **intersectoral multi disciplinary team** approach would be required for capacity building for which **proper institutes** should be identified for its **capacity building** . **Future R & D in industry & health** is also required to be strengthened to **identify & study alternative substance as preservative/catalyst/amalgum**.
- 9. Mercury content in Compact FL & linear Fluorescent Lamps for general use & Hg in cold cathod fluorescent lamp for electronic display will have **to be regulated** .
- 10. Mercury **emission from cremation** not easy to control.

#### What needs to be done: **Role of health sector**

- Health care facilities may be responsible for as much **as 5% of all mercury** release in the water.
- 1. Dealing with mercury **containing material**: Use of **mercury free alternative** thermometer, sphygmomanometers , other equipment's etc should be promoted Get these **equipment standardized** through QCI/IBS
- 2. **Health care waste** : Follow sound guidelines for handling & disposal of mercury . Ensure that mercury-containing devices are **taken back by the manufacturer or properly disposed off**.( Guidelines to be issues by respective Ministries. )
- 3. **Emission reduction**: Use Common BMW facilities for **incineration** instead of doing it separately by the hospitals.
- 4. Implement national Programme for prevention of **dental caries** as part of oral health and school health which will also reduce amalgum filling and will lead to reduction of emission at cremation. Amalgum can contain up to 50% of elemental mercury.
- 5. Develop **training programme** & material for Drs, nurses, health workers , environment engineers/ occupational safety & Env't inspectors, occupational health workers.

- **6. Develop dietary advice** for the people specially pregnant women and children of population exposed to mercury contamination. Assist states/UTs in preparing advice for pregnant and lactating women and children in the population at risk about the **risks and benefits of fish consumption**, indicating the type of fish that may be eaten and how often. Breastfeeding is strongly advised since the presence of methylmercury in breast milk is not sufficient to outweigh its benefits.
- 7. Identify **traditional practices**, folk medicines & cosmetics involving mercury & disseminate information on mercury hazards, exposure prevention and how to clean up spillages.
- 8. Research trial on better alternative to dental amalgam be conducted at AIIMS. Effect of Hg containing Quadrivalent & other vaccine in children to be studied.
- 9. At **least 5 medical colleges** should be identified where diagnosis, investigation, management of mercury poisoning, patient care facility and facility for training of doctors should be available.
- **And regional field investigation team** should also be identified for conducting detailed investigation on unusual cases of renal failure, memory impairment, tremor, erethism (red Plam), acrodynia (painful extremities) etc reported or many cases of psychomotor retardation, blindness, deafness, seizures etc reported among infants for possible mercury poisoning and its impact in the human being and environment.
- Where ever any mercury poisoning in human, fish is suspected the team should conduct prompt investigation.
- 10. Compensatory **scheme be developed** for getting back mercury thermometer & BP apparatus from house hold.

## Role for M/O Env't & Forest

- Form a natl nucleus in MOEF & support cell in MOHFW, MO Energy, MO Industry at natl & state level
- A natl assessment of mercury usage, disposal should be conducted.
- Develop natl policy on mercury considering it as hazardous waste, develop legislation required for regulation & implement the same (To be done by CPCB). Regulatory standards & advisories at the work place should be available (To be done by CPCB).
- 4. Develop mercury clean-up and **waste-handling**, storage and safe-handling procedures; promote **environmentally sound** management of health-related waste containing mercury (Dev't of appropriate guidelines by CPCB).
- Encourage Intl agencies to work with the natl manufacturers to develop & make inexpensive mercury free products
- **Natl apex lab and five regional labs** for **testing of mercury level** in food, blood, hair, exhaled air, urine, water, air, soil should be identified and their capacity should be developed.

## Highlight role of M/O Energy , M/O Industry & Labour

- Naturally occurring mercury sources include cinnabar (ore) and fossil fuels, such as coal , petroleum. **Envt contamination results from mining, smelting & industrial discharges will have to be regulated**
- Mercury in the air is deposited in the water. Bacteria in water can convert elemental mercury into organic compounds eg methymercury which may then accumulate in the fish and enter to human body through food chain as happened in Minamata. **Most of the mercury in the environment results from** coal fired power stations, residential heating system, waste incineration.
- **Emission level in the industries** should be monitored : coal fired power stations, mining of mercury, gold mining ( where mercury is used to form amalgam before being burnt off) and other metals such as Copper, zinc, silver as well as refining operations.
- **Occupational safety measures** should be applied to the people who are exposed to mercury vapour and contact.
- Encourage **stakeholders like manufacturers**, imports ,wholesalers , and retailers to develop and make widely available inexpensive mercury-free products, and facilitate their procurement.
- Quality control of industry /Accreditation system may be required to reduce the emission and Mercury release.

## M & E

- Promote **long-term monitoring** (including biological measurements of exposure) and programmes to reduce occupational exposure.
- Where ever mercury contamination is suspected proper study should be done,

Mercury in **biological products & antiseptics & other drugs, vaccines, cosmetics , AYUSH drugs** should be reviewed by DCG(I). Mercury containing **beauty creams, hair treatment** and other **cosmetics** may cause significant exposure and they should be regulated.

In the **food like fish** & other water based food should be reviewed by FSSAI and in **the soil, water & air** should be reviewed by CPCB.

Mercury level in **biocide, pesticides, insecticides** should be reviewed by ICAR.



## 4. CONFERENCE VISUALS





## 5. CONFERENCE AGENDA

### National Regulators Meet on the Minamata Convention on Mercury

Venue: Deck Suite, Indian Habitat Center

Date: 30 December, 2013

Time		Speaker
9.30-10.30	Welcome Address	<b>Mr.Satish Sinha</b> Associate Director, Toxics Link
	Overview of the Mercury Convention	<b>Mr.Ajay Tyagi,</b> Joint Secretary, Ministry of Environment and Forests
	Key note address	<b>Dr A. B. Akolkar</b> Member Secretary,CPCB
10.30-11.30	<ul style="list-style-type: none"> <li>• India's negotiation in the INC</li> <li>• Releases; Article-9</li> <li>• Emissions; Article -8</li> <li>• Capacity-building, technical assistance and technology transfer; Article 14</li> <li>• Public Information, Awareness and Education; Article -18</li> <li>• Research, Development and monitoring;</li> <li>• Article -19</li> </ul>	<b>Mr.R.N.Jindal</b> Additional Director, Ministry of Environment and Forests , Govt of India
11.30-12.00	<b>Discussion &amp; Tea Break</b>	
12.00-1.00	<ul style="list-style-type: none"> <li>• Environmentally sound interim storage of mercury other waste mercury; Article 10</li> <li>• Contaminated sites; Article 12</li> <li>• Financial Resources and Mechanism ; Article 13</li> </ul>	<b>Dr. Manoranjan Hota,</b> Director; Ministry of Environment and Forests, Govt. of India
1.00-1.30	<b>Discussion</b>	
	Lunch	

2.00-2.45	<ul style="list-style-type: none"> <li>• Mercury supply sources and trade. Article 3</li> <li>• Mercury-added products ; Article 4</li> <li>• Manufacturing processes in which mercury or mercury compounds are used; Article 5</li> </ul>	<b>Mr.Satish Sinha.</b> Associate Director, Toxics Link
<b>2.45- 3.00 Discussion &amp; Tea</b>		
3.00-3.30	<ul style="list-style-type: none"> <li>• Health Aspects ; Article 16</li> </ul>	<b>Dr. N. S. Dharamshaktu</b> Dy. Director; General (NSD), Ministry of Health & Family Welfare
<b>Discussion</b>		
Summing up and Recommendations		