MERCURY CONTAMINATION INCIDENT – AN INVESTIGATION

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Mercury spill in classroom triggers panic

BY PHUAH KEN LIN  26 MAY 2016  5:31 PM

BUKIT MERTAJAM: Some 56 students at a secondary school here had a scare today when they spotted spilled mercury inside their classroom.

A Fire and Rescue Department spokesman said its Bukit Mertajam station received a distress call about 10.15am.

No one was injured and the class session proceeded as usual at SMK Guar Perahu.

"A hazardous material (Hazmat) team arrived to clean up the spilled item shortly afterwards.

"Our early investigations showed that the spillage happened yesterday afternoon," he said.

The spokesman said some 30 firemen from the Bukit Mertajam and Prai as well as Jalan Perak stations were roped in to attend to the incident.
Mercury spill at school

BY LO TERN CHERN

BUKIT MERTAJAM: A mercury spill at a secondary school here led to a four-hour operation by the Fire and Rescue Department which saw 56 students quarantined.

Firemen and officers from the department rushed to SMK Guar Perahu upon receiving a report of the spillage in one of the blocks at the school.

According to the department’s spokesman Azman Hussin, they received the call at 10.12am yesterday.

“When firemen arrived at the scene, they discovered stains of about 50ml of spilled mercury.

“The mercury spill was found in two classrooms on the third floor and is believed to have occurred on Wednesday but was only realised yesterday.

“The department’s Hazardous Materials Squad (Hazmat) suited in personal protective equipment began cleaning works after ordering students to evacuate the scene.

“The 56 affected students were immediately ordered to be quarantined in a classroom to ensure that they did not come into contact with the mercury.

“Although all students were reported to be safe and unharmed, six of them were brought to hospital for further checks to confirm they were completely safe.

“The scene was confirmed cleaned at 2.16pm,” said Azman in a statement yesterday, adding that a total of 28 firemen including officers were involved in the operation.

The inhalation of mercury can affect the nervous, digestive and immune systems, lungs and kidneys, and may be fatal.
56 pelajar dikuarantin akibat tumpahan merkuri

27 Mei 2016 12:19 AM

BUKIT MERTAJAM 26 Mei – Suasana tenang ketika sesi pembelajaran awal pagi hari ini bagi dua kelas tingkatan empat Sekolah Menengah Kebangsaan (SMK) Guar Perahu Indah di sini bertukar gempa selepas 56 pelajarnya tiba-tiba mengalami masalah pernafasan.

Kejadian pada pukul 10.12 pagi itu disedari guru salah sebuah kelas yang terletak di tingkat dua sebuah bangunan di situ yang kemudian membuat siasatan lanjut.

Hasil maklumat daripada pelajarnya, guru itu mendapat masalah kesihatan yang dialami secara tiba-tiba itu berpunta daripada tumpahan ceair merkuri.

Cecair berbahaya itu didakwa dibawa salah seorang pelajar kelas terbabat dan dikatakan tertumpah di atas lantai semasa mereka bermain di dalam kelas itu tengah hari semalam.

Bimbang dimarah, pelajar yang membawa ceair itu dari rumahnya berpakaat dengan rakan-rakan lain untuk merahkanannya daripada pengetahuan guru mereka.

Bagaimanapun pagi ini, pencemaran akibat tumpahan itu meninggalkan kesan terhadap dua buah kelas menyebabkan mereka terpaksa dikuarantin dalam sebuah kelas lain.

Pihak pentadbir sekolah itu kemudian menghubungi Jabatan Bomba dan Penyelamat Bukit Mertajam memaklumkan kejadian berkenaan.

Komander Unit Bahan Berbahaya (Hazmat) balai bomba berkenaan, Penolong Pegawai Bomba (Hazmat) Pulau Pinang, Poh Leong Soon berkata, sekumpulan 28 anggotanya telah ke sekolah tersebut sebaik sahaja menerima laporan dan mendapat terdapat kesan tumpahan merkuri.

"Hasil pemeriksaan lanjut mendapati tumpahan ceair merkuri itu kira-kira 50 mililit liter (ml) dan sebagai langkah keselamatan kesemua pelajar itu terpaksa dikuarantin di dalam sebuah kelas lain," katanya.

Menurut beliau, operasi menyelamat dan membersih tumpahan ceair kimia itu selesai sepenuhnya pada pukul 2.16 petang dan lokasi berkenaan telah disahkan selamat.
Sixteen rushed to hospital for suspected mercury poisoning

BY BALVIN KAUR  29 MAY 2016  9:13 PM

BUTTERWORTH: Sixteen residents of Kampung Baru here were rushed to hospital today for suspected mercury poisoning.

The 16, from six houses, were sent to the Bukit Mertajam Hospital after a mercury spillage occurred at their houses today.

Mercury is deemed extremely toxic, and can be found in thermometers and some fluorescent light bulbs.

Kepala Batas Fire and Rescue Department senior assistant superintendent Abdul Aziz Yusuff said all 16 victims are still being warded and are reportedly stable.

He said the houses of the victims had also been vacated since this morning.

“We were informed that the mercury was brought to the houses by the children of the occupants, who had found it near their homes.

“A team of 26 firemen, including hazardous material (Hazmat) personnel from the Kepala Batas, Perai and Jalan Perak Fire and Rescue stations had been carrying out cleaning work since this morning,” he told reporters here today.

He said the department is still investigating how the children got hold of the mercury and how it came to be left unattended in the residential area.

This marks the second scare involving mercury this week. On Thursday, 56 students of Sekolah Menengah Kebangsaan Guar Perahu, Bukit Mertajam were also quarantined after a mercury spillage in their classroom.
Students in Malaysia bring mercury to school in plastic bag, forcing 56 to be quarantined

BUTTERWORTH (THE STAR/ASIA NEWS NETWORK) - The mercury spill at a secondary school in Gua Perahu which led to 56 students being quarantined and 16 residents of six houses in Kampung Baru being hospitalised is believed to have originated from a nearby oil palm plantation in Bukit Tok Alang.

Tasek Gelugor Fire and Rescue Department station chief Muhammad Hayazi Taib said several SMK Gua Perahu students had obtained the mercury from an abandoned water meter room in the plantation.

"They told us that they were in the room taking shelter from the rain when they stumbled upon the silvery liquid on the ground."

"They then collected about 300ml of it and took it to the school in a plastic bag to show their friends on Wednesday.

"We do not know what they did to cause the mercury to spill in two classrooms on the third floor of the school building,” he told reporters at the oil palm plantation on Monday (May 30).

The department's Hazardous Materials Squad (Hazmat) spent five hours cleaning up the meter room from 10.30am, using sulphur to contain the mercury around the premises to reduce evaporation before collecting it for disposal.
Polis siasat kes tumpahan merkuri di Tasek Gelugor

GEORGETOWN: Polis Pulau Pinang akan menytasat punca tumpahan cecair merkuri sehingga menyebabkan beberapa rumah dan kelas sebuah sekolah di Tasek Gelugor terdedah kepada bahan kimia itu baru-baru ini.

Ketua Polis negeri, Datuk Abdul Ghafar Rajab, berkata walaupun merkuri adalah bahan yang agak berbahaya kepada kehandan, ia mudah didapati dan tidak tergolong dalam kategori bahan letupan.

"Merkuri bukanlah bahan hakisan atau letupan dan ia boleh dibeli (dengan mudah)," katanya selepas Perhimpunan dan Ikrar Bulanan Polis Kontinjen Pulau Pinang di sini, hari ini.

Dalam kejadian Sabtu lalu, 15 penduduk di Jalan Padang Menora, Kampung Baru di Tasek Gelugor dihantar ke hospital untuk pemeriksaan kerana dikhautiri terdedah kepada cecair merkuri.

Sebelum itu pada 26 Mei, 56 pelajar Sekolah Menengah Kebangsaan Guan Perahu, Bukit Mertajam turut dikuarantin selepas berlaku tumpahan merkuri di kelas mereka.

Dalam perkembangan lain, polis menahan seorang kakitangan awam yang bertugas di Ibu Pejabat Polis Kontinjen Pulau Pinang kerana dipercayai terlibat dengan kes ragut di kawasan Bandar Baru Air Itam, di sini.

Ketua Polis Daerah Timur Laut ACP Mior Faridalatash Wahid, berkata dalam kejadian jam 6 pagi Selasa lalu, suspek dipercayai meragut beg tangan mangsa yang berumur 42 tahun sehingga menyebabkan mangsa cedera ringan.

"Polis yang sedang menjalankan rodaan menahan suspek yang berusia 28 tahun itu sejurus selepas kejadian dan kes akan disiasat mengikut Seksyen 394 Kanun
Tumpahan merkuri: Semua 81 individu disyaki tercemar selamat

AZHARI ZAINOODIN | 04 Jun 2016 5:40 PM

PULAU PINANG 4 Jun - Semua 81 individu yang dikuatiri tercemar dengan tumpahan merkuri dalam dua kejadian berasingan di negeri ini hujung bulan lalu disahkan selamat.

Timbalan Pengarah Kesihatan negeri (Kesihatan Awam), Dr. Norlia Yahaya berkata, semua mangsa terbabit terdiri daripada 50 penghuni di enam buah rumah di Kampung Baru Jalan Kubang Menerong, Tasik Gelugor dan 61 warga Sekolah Menengah Kebangsaan Guar Perahu Indah, Permatang Pauh yang dikejarkan ke hospital telah dibenarkan pulang ke rumah masing-masing.

Bagaimanapun tegas beliau, perkembangan kesihatan mangsa terlibat akan dipantau dalam tempoh panjang yang mungkin menjangkau lebih 10 tahun.

"Biarpun pemeriksaan menunjukkan semua mangsa tidak terjejas, pemantauan berterusan perlu dilakukan memandangkan kesan merkuri ini boleh memakan masa lama sebelum tanda-tandanya dapat dikesan.

"Setakat ini pemeriksaan darah dan air kencing yang dilakukan terhadap mangsa menunjukkan perkembangan positif biarpun ada beberapa mangsa terlibat sebelum ini menunjukkan seolah-olah adanya tanda tercemar bahan kimia berkenaan," katanya kepada pemberita di sini hari ini.


Tambah Norlia, mangsa yang sebelum ini menunjukkan tanda seperti dicemari merkuri membabitkan 33 individu dari Kampung Baru Tasek Gelugor.

"Antara tanda yang ditunjukkan mangsa terlibat adalah batuk, sesak nafas, sakit perut dan pening kepala, namun semua mereka telah diberi rawatan serta menunjukkan perkembangan positif.

"Pihak Kesihatan negeri akan terus memastikan tahap kesihatan semua mangsa terlibat adalah baik dan tidak terjejas demi menjamin kelangsungan hidup mereka," jelas beliau.

Selain itu, katanya, siasatan lanjut sedang diteruskan pihaknya bersama beberapa agensi kerajaan lain berhubung kejadian tumpahan bahan kimia berkenaan termasuk mencari pihak terlibat yang meninggalkan bahan kimia terbabit di sebuah kawasan ladang di negeri ini.
WHAT IS MERCURY?

• Mercury (Hg) is a toxic element

• May exist in 3 different forms:
  - Elemental Hg
    - liquid metal with high vapor pressure
    - Hg vapor denser than air
    - 13 times heavier than water
    - 1 tablespoon of Hg\(^0\) has a mass of about 150 g (1 L Hg \(\sim\) 13.5 kg)
  - Inorganic Hg (dental amalgams & vaccines)
  - Organic Hg (consumption of fish)

• The main route of concern is INHALATION-80% inhaled is absorbed
HEALTH EFFECTS OF MERCURY

• Chronic exposure of > 1 month — may damage nervous system & kidney

• Neurologic symptoms include:
  □ Decreased nerve impulse conduction
  □ Decreased motor skills (hand-eye coordination)
  □ Irritability
  □ Poor concentration
  □ Tremors
  □ Incoordination
  □ Short-term memory loss

• Other symptoms may include:
  □ Abdominal cramps
  □ Diarrhea
  □ Eye irritation
  □ Skin rashes
  □ Acrodynia (pink coloured palm & soles of the feet, excessive sweating, itching, joint pain, swelling, weakness, difficulty sleeping)
21.5.2016
• 3 friends: Iskandar (16 years old - SMK Guar Perahu)
  Zulkefli (19 years old)
  Azlan (18 years old)
  Kg. Baru Padang Menora, Tasek Gelugor
  Palm oil plantation Bukit Toh Alang — bird hunting
PBA abandoned facility

Mercury found scattered on the floor
22.05.2016
• They came back to get more Hg at the PBA house
• Total Hg collected: 700 ml
• Shared among them & brought home

23.05.2016 – 24.05.2016
• Iskandar & Azlan played with Hg at Zulkefli’s house

25.05.2016
• Iskandar brought Hg to his school and played with his classmates.
• None of the students knew it was Hg
• Not even the teachers
• A Science teacher discovered it was Hg later in the evening
• Students threw Hg into dustbin and some are left on the floor
26.05.2016
• School staff reported about the Hg incident to Fire Department, Royal Police Department (PDRM), Department of Occupational Safety and Health (DOSH), Chemistry Department and Emergency Department of Bukit Mertajam Hospital.

• Fire Department team arrived at school around 10 am to start investigation along with HAZMAT team to start decontamination procedure.

• The Health District Department of Seberang Perai Tengah received notification from Emergency Department of Bukit Mertajam Hospital at 4.30 pm.

30.05.2016
• IMR team was called in to assist in investigation
• Together with personnel from KPAS, MOH — Dr Norlen Mohammad
OBJECTIVES

• To determine Hg vapor concentrations at several affected localities as part of hazardous waste and emergency response to mercury contamination
BIOLOGICAL SAMPLING

- A total of 146 blood & urine (spot and 24 hours) samples were collected
- 70 samples taken by BMH were index cases and their contacts
- 76 samples taken by Health District Department were staff of government agencies involved in investigation
- All samples were sent to Chemistry Department for further analysis.

Hg VAPOUR ANALYSIS

- Hg vapour measurements was conducted by IMR team using Nippon Instrument Corporation (NIC) EMP-1A Mercury Gas Monitor
- It records instantaneous data through a data logger
- Five dwellings and two classrooms were selected as sampling locations
METHODOLOGY

House 1
METHODOLOGY
House 2
METHODOLOGY
House 3, 4 & 5
METHODOLOGY
Classroom 1
METHODOLOGY
Classroom 2
RESULTS

PERCENTAGE OF INDIVIDUALS WITH SYMPTOMS OF MERCURY EXPOSURE

- Cough: 40.9%
- Nausea: 31.8%
- Shortness of breath: 31.8%
- Diarrhea: 22.7%
- Dizziness: 22.7%
- Headache: 22.7%
- Fever: 18.2%
- Chest pain: 18.2%
- Stomach pain: 18.2%
- Sore throat: 13.6%
- Tiredness: 13.6%
- Paraesthesia: 9.1%
- Skin problem: 9.1%
- Vommit: 4.5%
- Flu: 4.5%

SOURCE: PKD SPT
RESULTS

BLOOD HG LEVELS

- All exposed individuals showed negative blood Hg levels

URINE HG LEVELS

- Majority of the exposed individuals showed negative urine Hg levels HOWEVER 6 individuals (index cases and contact) showed spot urine Hg levels between 0.001 µg/L - 0.009 µg/L
- All health staff involved in investigation showed negative urine Hg levels
- The limit of Hg in urine is 0.02 µg/L

SOURCE: PKD SPT
Average Hg vapor concentrations
CHELATION THERAPY

• Since all exposed individuals showed non-significant mercury levels for blood and urine, it was decided that chelation therapy will not be proceeded.

IMPROVE VENTILATION

• Suggestion to improve ventilation by opening doors and windows helped to reduce mercury concentrations significantly.
• Results from Chemistry Department confirmed that the material found at the PBA facility is Hg.

• All 83 exposed individuals were identified and diagnostic tests have been conducted (blood & urine Hg)

• Hg vapor measurements using Hg Gas Monitor has facilitated the HAZMAT team in ensuring the decontamination procedure was effective.

• Investigation is still ongoing to identify the culprit who dumped the mercury at abandoned PBA facility.

• It is hoped that the mercury spill has increased awareness of the public regarding Hg toxicity and thus be more conscious.