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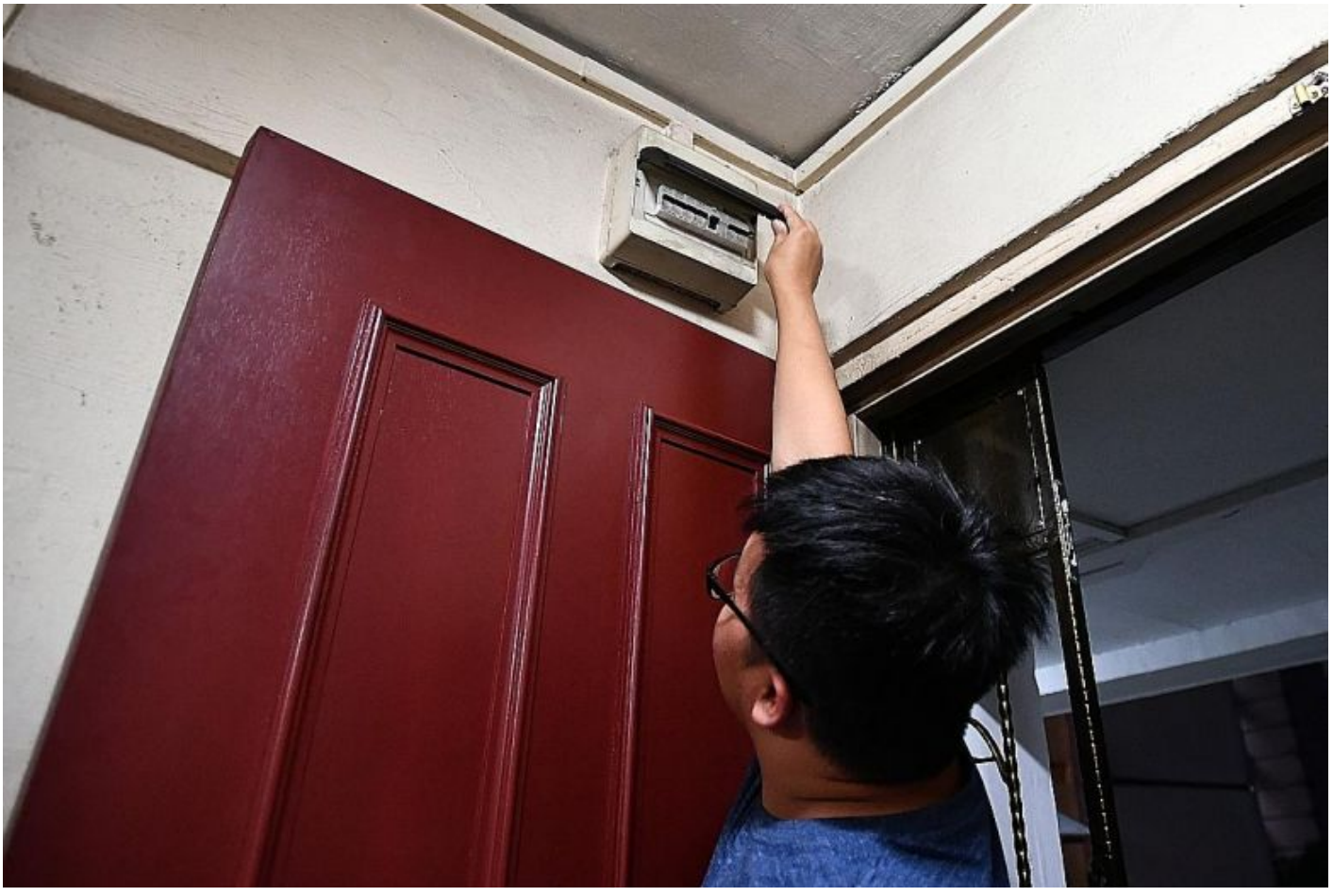
# Improper heater wiring caused boy's death while showering



Mr Tan Qi Wei, the brother of 15-year-old Tan Yao Bin who was electrocuted while showering, showing the circuit breaker inside the family's flat yesterday. Three days after his brother's death, the family rewired the whole house and replaced the faulty circuit breaker. ST PHOTO: LIM YAOHUI

PUBLISHED OCT 19, 2018, 5:00 AM SGT

## Coroner's inquiry into 2016 electrocution death also finds flat's circuit breaker was faulty

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The improper wiring of a water heater to a three-pin plug by workers unlicensed to do electrical work after a Housing Board upgrading programme was behind the death of a 15-year-old boy, who was electrocuted while showering.

A coroner's inquiry into Tan Yao Bin's death also found that the flat's circuit breaker, which should have cut off the electrical supply to prevent the tragedy, was faulty as well.

The 2016 incident has since led the Housing Board to inform its contractors to alert residents in writing when they find water heaters connected by three-pin plugs.

And home owners have also been advised to test their circuit breakers monthly by pushing its test button and seeing if it trips.

Yao Bin's mother, Madam Zhang Aiyan, had decided in 2015 to get a new water heater installed after renovation works at their Bukit Batok flat under the Home Improvement Programme (HIP) were completed.

She asked a worker from JL Engineering Construction, the electrical subcontractor for the project, to install the heater.

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The workman connected the heater to an existing three-pin plug, which was later plugged into a normal wall socket. The worker's supervisor, Mr Ooi Kah Heong, also tested the wiring as well as the circuit breaker and found them to be in order.

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**During investigations, it was found that the cable connecting the neutral and earth terminals in the plug was loose, and the neutral and earth cables had melted and fused together. The earth cable was also connected to the casing of the heating tank, which was connected to the shower-head by a metallic hose.**

## WHAT HOME OWNERS SHOULD DO

• Do not wire a three-pin plug to a water heater. Three-pin plugs can support currents of only up to 13A, and water heaters draw currents of up to 20A. Water heaters should instead be wired to a double-pole switch rated at 20A.

• Test your circuit breaker. A manual trip test can be done by pressing the test button of the circuit breaker on your home's distribution box. It should trip when the button is pressed.

However, three-pin plugs and normal wall sockets are not designed to support the current drawn by water heaters. They should instead be wired directly to a special switch which is able to support higher current.

Both Mr Ooi and his worker were not licensed electrical workers.

Mr Ooi told the inquiry that he had been aware that it was unsafe for a water heater to be wired to a three-pin plug. But he still did so as he thought his job was to "reinstate what was formerly in the toilet".

He also said that in his experience with more than 30 HDB blocks, almost 78 per cent of water heaters were connected to three-pin plugs.

Mr Ooi testified that he would inform the owner of a unit undergoing HIP that this was unsafe, and offer to change it. But he said he did not have the chance to tell Yao Bin's family as he never met them.

During investigations, it was found that the cable connecting the neutral and earth terminals in the plug was loose, and the neutral and earth cables had melted and fused together. The earth cable was also connected to the casing of the heating tank, which was connected to the shower-head by a metallic hose.

State Coroner Kamala Ponnampalam said this would mean that the current would have completed its path by flowing into the tank's casing, through the hose, and into Yao Bin's body, followed by the wet ground.

The current flowing through Yao Bin's hand was 0.95A, which was enough to deliver a fatal electric shock. At the same time, the circuit breaker did not trip off to isolate the electricity supply to the water heater.

She said this "unfortunate misadventure" highlighted the importance of handling electrical devices with caution. Contractors and their workers should also be mindful about carrying out work that poses a clear safety hazard.

She added: "They ought to alert the resident to the potential dangers."

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