

Refuse Chute Fires in Public Housing Estates (2014 – 2016)

The Singapore Civil Defence Force (SCDF) responds to all reported fires in Singapore for firefighting and fire investigation. The archiving of detailed records for all these fires has enabled these studies for the purposes of public education and fire prevention.

The SCDF Fire Analysis Report series aim to make sense of similar fires seen over the years. Each report will provide details on the trends, patterns and other findings from the analysis of a specific type of fire or fire-related topic. Relevant examples of actual fire incidents will also be presented. In addition, fire safety tips or references to sources of information relating to fire prevention will be provided.

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Key Findings

- Refuse chute fires account for 24.7% – 26.0% of all reported fires in Singapore annually.
- On average, there are 3 refuse chute fires every day.
- The gradual fall in the number of refuse chute fires from 11 pm till 5 am, the rise thereafter with localised peaks at 12 pm – 2 pm and 7 pm – 9 pm is observed to be a hardy trend seen year-on-year since 2008.
- The relatively lower number of refuse chute fires from Tuesdays to Thursdays and the ascent thereafter, peaking on Sundays is another recurring pattern in the last 9 years.
- Chinese New Year (CNY) eves continue to see exceptionally high numbers of refuse chute fires every year since 2008.

Number of Refuse Chute Fires

Refuse chute fires account for between 24.7% – 26.0% of all fires reported in Singapore annually as shown in **Figure 1**. At over 1,000 cases each year, this equates to an average of over 3 cases every day [1, 2].

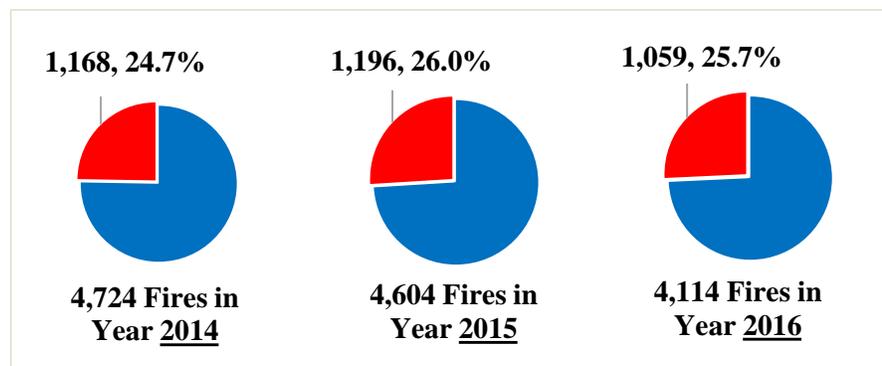


Figure 1. Refuse chute fires (2014 – 2016)

The proportion of refuse chute fires¹ is noted to have fallen to 24.7% in 2014 to about 26% in 2015 and 2016 (See **Figure 2**).

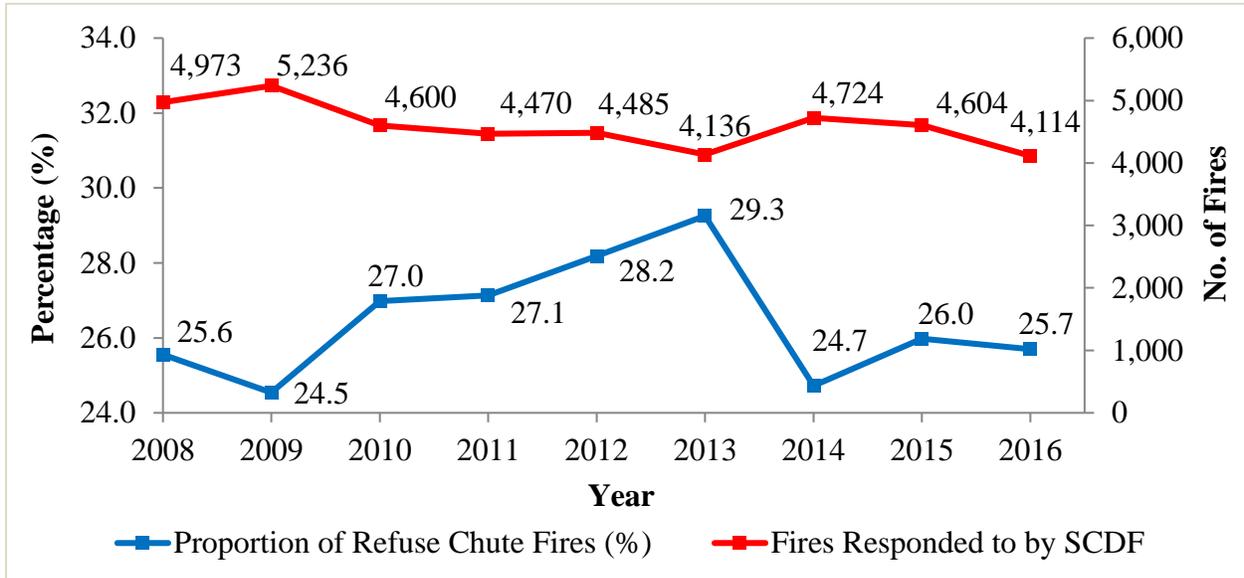


Figure 2. Proportion of refuse chute fires (2008 – 2016)

A breakdown of residential fires (including private residences) from 2014 – 2016 shows that refuse chute fires continued to make up the biggest slice of the pie as seen in **Figure 3**. This is followed by fires involving unattended cooking and rubbish bins.

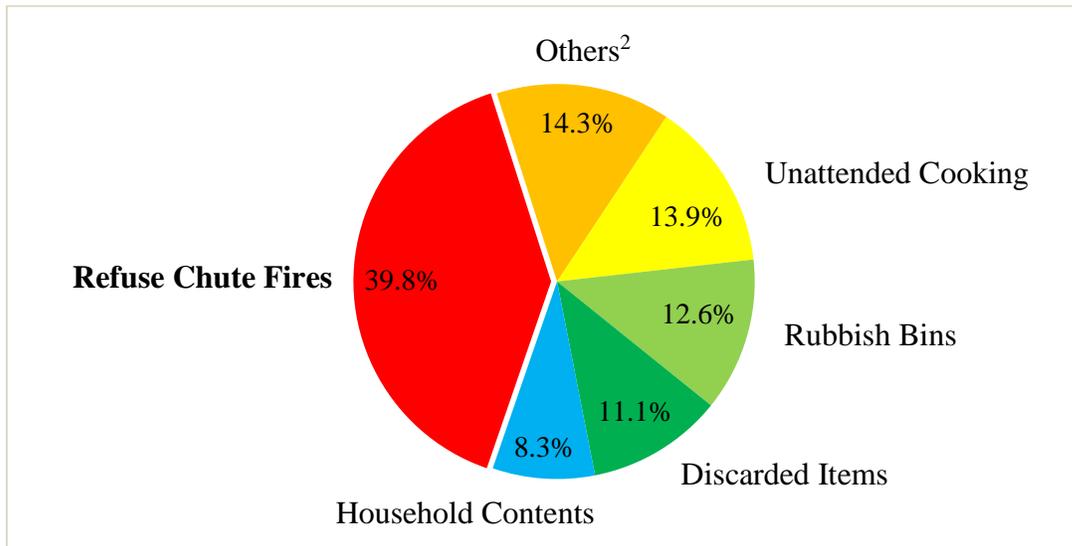


Figure 3. Breakdown of residential fires (2014 – 2016)

¹ This refers to the number of refuse chute fires in a year against the total number of reported fires in that same year

² These include electrical fires, gas fires and fires involving items placed along the corridors or at the void decks

Time of Occurrence

Figure 4 shows that the number of refuse chute fires is generally low in the early morning between 3 am and 6 am. After 6 am, the number of incidents rises and peaks between 12 pm to 2 pm. Thereafter, it decreases gradually, with another localised peak between 7 pm to 9 pm. From 11 pm onwards, the number of refuse chute fires declines. This overall trend in the hourly breakdown of refuse chute fires (2014 – 2016) is noted to be enduring and similarly observed in the preceding 6-year period from 2008 to 2013 [3, 4].

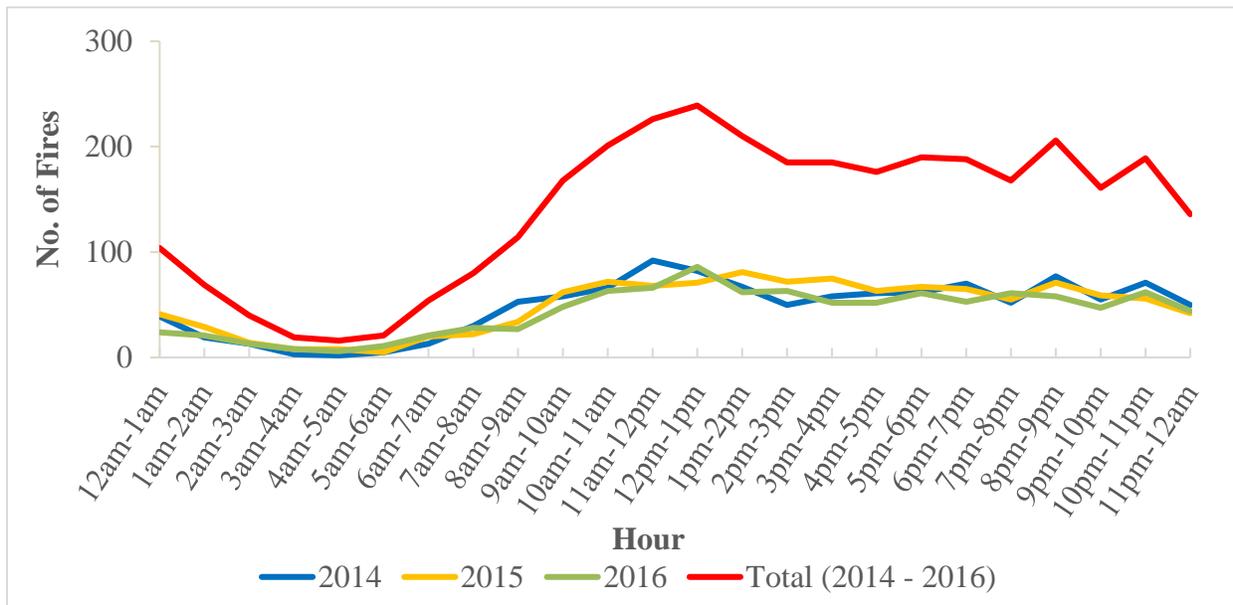


Figure 4. Occurrence time of refuse chute fires (2014 – 2016)

Day of Occurrence

Figure 5 shows that the number of refuse chute fire is relatively lower at mid-week from Tuesdays to Thursdays. However, Fridays will see the figure climbing and peaking on Sundays. Thereafter, refuse chute fires will commence their descent. Such a trend is also noted to be persistent and seen in the preceding 6-year period from 2008 – 2016 [3, 4].

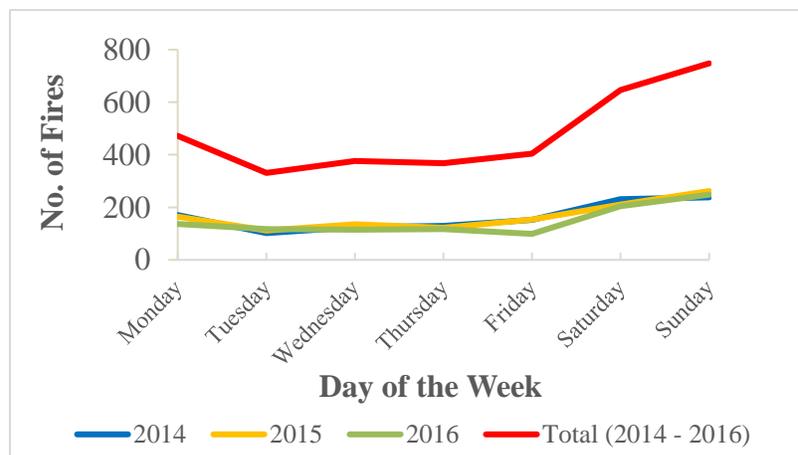


Figure 5. Refuse chute fires by day of the week (2014 – 2016)

Month of Occurrence

In the earlier studies on refuse chute fires from 2008 – 2013 [3, 4], it was reported that the months that coincided with Chinese New Year (CNY) holidays have unusually high numbers of refuse chute fires. This trend continued for 2014 – 2016.

The first day of the CNY falls on 31 January, 19 February and 8 February for 2014, 2015 and 2016 respectively [5, 6, 7]. Accordingly, January 2014, February 2015 and February 2016 were the months which saw exceedingly high numbers of refuse chute fire as evident in **Figure 6**.

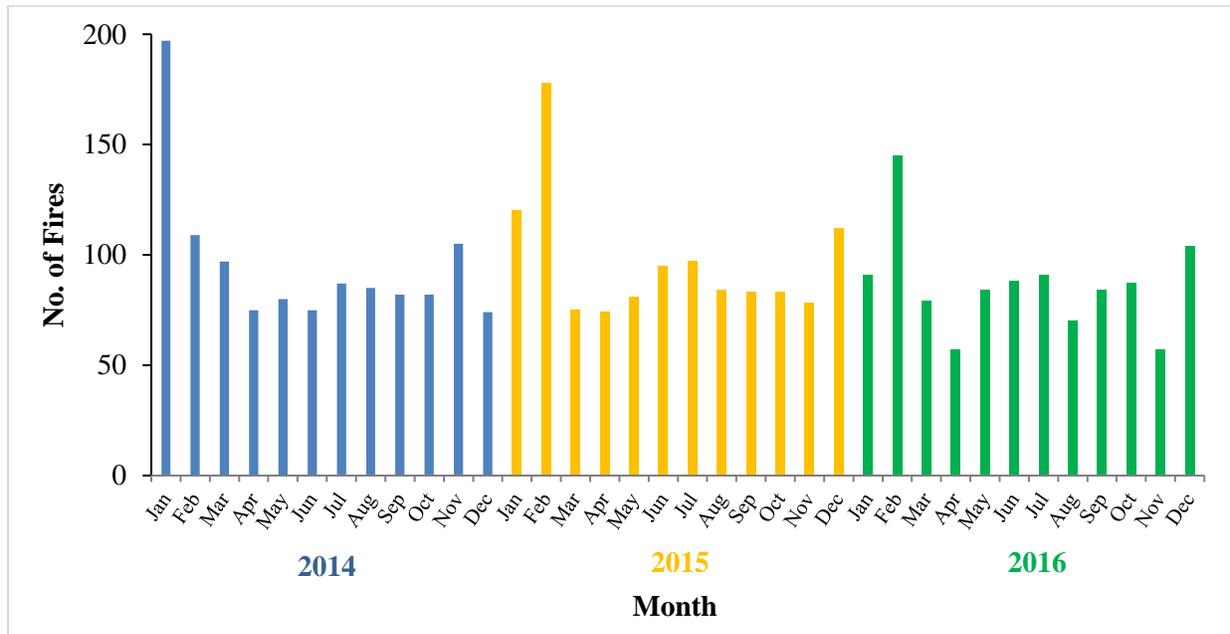


Figure 6. Refuse chute fires of the months (2014 – 2016)

This is again a persistent trend which can be seen year-on-year since 2008. A breakdown by day of the 3 CNY months revealed that most of the fires occurred on the eve of CNY as seen in **Figures 7, 8 and 9**. A recurring lower peak is also observed on the 9th day of CNY for 2014 and 2016 which coincides with the occasion where the Chinese traditionally pray.

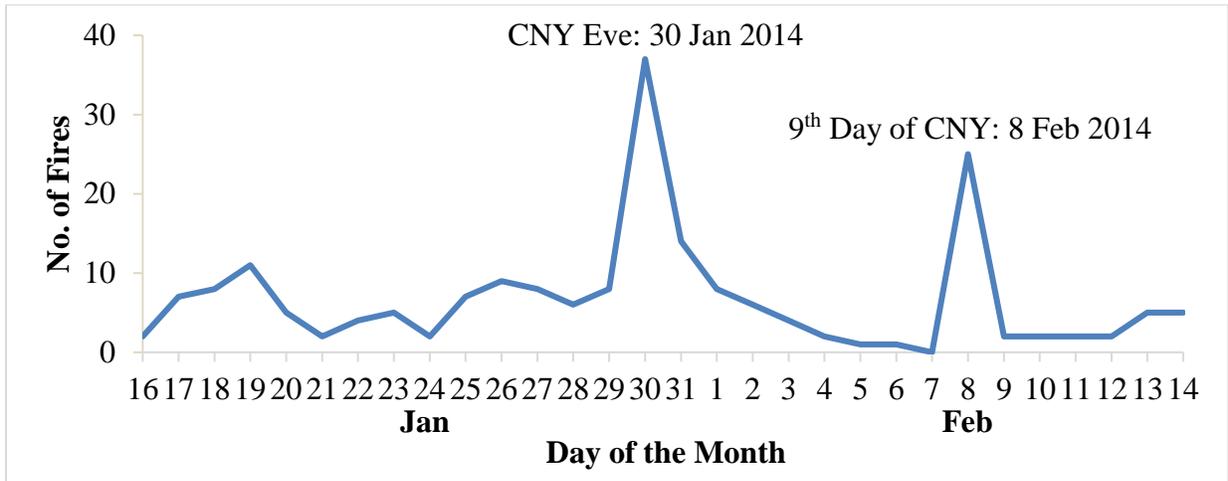


Figure 7. Refuse chute fires for the CNY months of January / February 2014

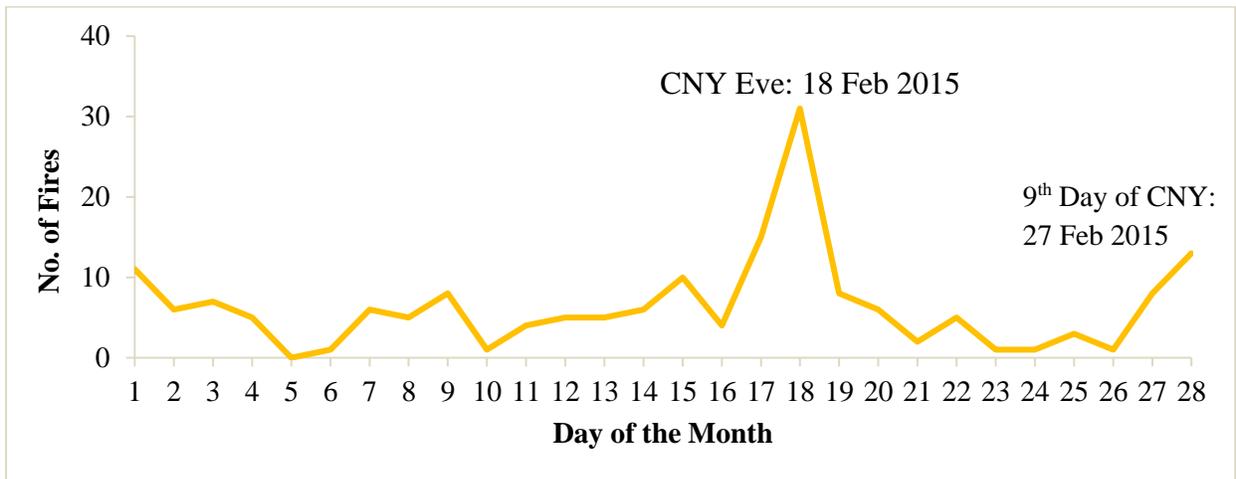


Figure 8. Refuse chute fires for the CNY month of February 2015

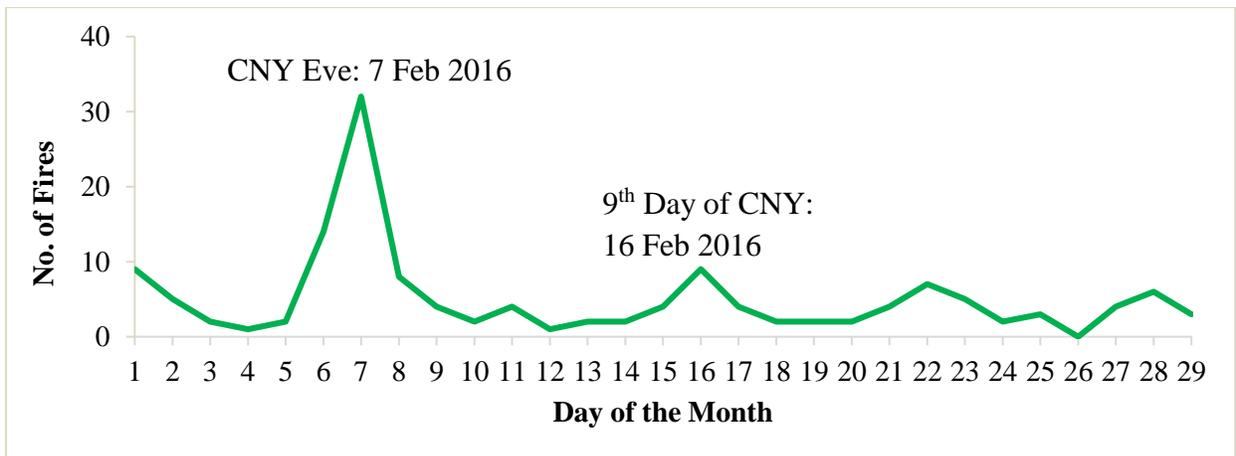


Figure 9. Refuse chute fires for the CNY month of February 2016

From the Case Files

Case #1: March 2016, Telok Blangah

In a span of 1 month, there were 8 fire incidents at the Centralised Refuse Chute (CRC) of one of the blocks in Telok Blangah estate.

Besides causing environmental nuisance and alarm to residents, SCDF firefighting resources were also dispatched for firefighting and investigation. To ensure that the fires were fully extinguished and for the purpose of investigation, the contents of the Refuse Handling Equipment (RHE) were emptied on each and every occasion of fire (See **Figure 10**). Every storey was also searched. In the refuse hoppers of different levels of the block, burnt marks and partially burnt newspapers were observed (See **Figure 11**). In view of this and other factors, the cause of fire was determined to be incendiary and the incidents were referred to Police for further investigation. Town Council personnel also worked with SCDF to remind residents of the good practices for preventing such fires. The efforts paid off and there were no new fire incidents seen at the refuse chute.



Figure 10. The contents of the Refuse Handling Equipment (RHE) were emptied on each and every occasion of fire



Figure 11. In the refuse hoppers of different levels of the block, burnt marks and partially burnt newspapers were observed

Case #2: October 2016, Choa Chu Kang

At about 9.40 pm, SCDF responded to a case of fire in a CRC. On SCDF's arrival, the roller shutter of the bin centre was observed to have bulged out (See **Figure 12**). The contents of the RHE have also spilled out (See **Figure 13**). This overpressure was possibly caused by an aerosol can rupturing in the fire. It was fortunate that there was no one in the vicinity during the incident as such a blast effect can injure or even kill.



Figure 12. The roller shutter of the bin centre was observed to have bulged out



Figure 13. The contents of the RHE have also spilled out

Caution!

Commonly caused by the indiscriminate disposal of lighted materials, fires in the refuse chutes can cause items such as aerosol cans, within the refuse, to rupture. The resulting overpressure can be as serious as that seen in Case #2.

Any person found to have deliberately set fire to the contents of the refuse chute may be charged with Mischief by Fire under Section 435 of the Penal Code, Chapter 224. Persons found guilty of such a charge may be punished with imprisonment for a term which may extend to 7 years, and shall also be liable to fine [8].

References

[1] Singapore Civil Defence Force, 2014, Fire, Ambulance and Enforcement Statistics, viewed 17 January 2017, <https://www.scdf.gov.sg/sites/www.scdf.gov.sg/files/TOPIC%20A%20-%20Fire%20Stats%20for%20Jan%20to%20Dec%202014%20%28100215%29.pdf>

[2] Singapore Civil Defence Force, 2015, Fire, Ambulance and Enforcement Statistics, viewed 17 January 2017, <https://www.scdf.gov.sg/sites/www.scdf.gov.sg/files/Fire%20Incident%20Statistics%20Jan-Dec%202015.pdf>

- [3] Singapore Civil Defence Force, 2017, Refuse Chute Fires in Public Housing Estates (2008 – 2010), viewed Jan 2017, https://www.scdf.gov.sg/content/scdf_internet/en/general/publications.html
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- [5] Ministry of Manpower, 2013, Singapore Public Holidays 2014, viewed 24 January 2017, <http://www.mom.gov.sg/newsroom/press-releases/2013/singapore-public-holidays-2014>
- [6] Ministry of Manpower, 2014, Singapore Public Holidays 2015, viewed 24 January 2017, <http://www.mom.gov.sg/newsroom/press-releases/2014/singapore-public-holidays-2015>
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- [8] Attorney-General's Chambers, 2017, Penal Code, viewed 17 January 2017, http://statutes.agc.gov.sg/aol/search/display/view.w3p;ident=58c396ee-23b0-493c-91a6-e5c3d6ea9966;page=0;query=DocId%3A%22025e7646-947b-462c-b557-60aa55dc7b42%22%20Status%3Ainforce%20Depth%3A0;rec=0#P4XVII-P4_425-