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NEA TO COMMENCE DAILY HAZE FORECASTS FROM 16 JUNE 2014 IN VIEW OF DRIER WEATHER CONDITIONS IN SUMATRA AND THE ONSET OF THE SOUTHWEST MONSOON

Singapore, 13 June 2014 – The onset of the Southwest Monsoon season¹, a traditional dry season for the southern ASEAN region, raises the possibility of transboundary haze. The National Environment Agency will commence daily haze forecasts and health advisory from 16 June 2014.

2 Over the past few days, drier weather conditions have affected parts of the region, and isolated hotspot activities were visible in parts of Sumatra and Kalimantan. In the coming weeks, the prevailing Southwest Monsoon is expected to strengthen and persist with winds forecast to blow mostly from the southeast or southwest. The Meteorological Service Singapore (MSS) had also earlier forecast weak to moderate El Nino conditions to develop in the next few months, which could exacerbate the drier and warmer conditions over Singapore and the region during the Southwest Monsoon season. Prolonged drier and warmer conditions during an El Nino will increase the risk of the occurrence of transboundary smoke haze from land and forest fires in the region affecting Singapore.

3 The Inter-Agency Haze Task Force which coordinates 23 Government agencies has already convened early this year. The respective agencies have reviewed their action plans to mitigate the effects of haze on the public.

Air quality monitoring

4 Since 1 April 2014, the National Environment Agency (NEA) implemented an integrated air quality reporting index in which PM2.5 was incorporated into the Pollutant Standards Index (PSI) as its sixth parameter². Similarly, the 3-hour PSI now also takes into account PM2.5 concentrations. Additionally, 1-hour PM2.5 concentrations readings are being published every hour.

5 NEA will continue to monitor the weather, hotspot and haze situation in the region and issue the daily haze forecasts and health advisories. This will commence from 16 June

¹ Southwest Monsoon season typically last from June to September/ early October.

² The PSI will reflect six pollutants which are sulphur dioxide (SO₂), particulate matter (PM₁₀) and fine particulate matter (PM_{2.5}), nitrogen dioxide (NO₂), carbon monoxide (CO) and ozone (O₃). More information on the new PSI can be found here: <http://app2.nea.gov.sg/anti-pollution-radiation-protection/air-pollution-control/psi>.

2014 based on the new PSI system³, as well as the Ministry of Health (MOH)'s health advisories and Ministry of Manpower (MOM)'s workplace guidelines⁴. The public will be able to read the latest advisories at the haze microsite (www.haze.gov.sg), the NEA website (www.nea.gov.sg), or follow NEA on NEA Facebook (www.facebook.com/NEASingapore) and NEA Twitter (@NEAsg).

Healthcare preparedness and mask distribution

6 MOH is also working closely with healthcare institutions, polyclinics as well as GP and Intermediate Long-Term Care (ILTC) partners, amongst others, to ensure that the healthcare sector is adequately prepared for haze episodes. There are contingency plans for the healthcare sector which aim to maintain patient safety, meet increased healthcare demand and minimise disruption to medical services. Measures will also be taken to ensure that patients in MOH's acute and community hospitals, as well as patients in nursing homes, are not adversely affected by the haze situation. If the situation warrants it, the Haze Subsidy Scheme will also be re-activated.

7 N95 masks are not needed for short exposure to haze, such as commuting from home to school or work, travel from bus-stop to shopping mall. N95 masks are also not needed in an indoor environment. The public may wish to refer to MOH's health advisory for guidance on when and how N95 masks are to be used. The Government has put together a stockpile of 16 million N95 masks to help ease supply shortages if required. MOH has also pre-positioned masks with distributors and the People's Association.

Preparedness of educational institutions

8 All primary and secondary schools have in place a set of haze management plans and are ready to implement the appropriate haze management measures as required. If necessary, outdoor school activities may be replaced with alternative indoor arrangements, postponed or cancelled. The Ministry of Education (MOE) will also consider closing all primary and secondary schools to students when the haze forecast and health advisory for the next day indicates that the air quality will be at hazardous level. Schools will contact parents to inform them of the closure via phone or SMS.

9 Kindergartens (including MOE Kindergartens and Kindergarten Care Centres) and childcare centres will take guidance from the Early Childhood Development Agency (ECDA) on the preparation for haze. ECDA will align the closure of kindergartens and child care centres to the closure of schools, if any.

10 During haze season, MOE and schools⁵ will continue to closely monitor the haze situation and take appropriate management measures based on the health advisory issued.

Workplace safety

11 In accordance with the revised PSI bandings and MOH's revised health advisory, the Ministry of Manpower (MOM) has updated its guidelines to advise employers and provide them with general measures for workplace safety and health protection in the event of haze.

³ The PSI value and its corresponding air quality descriptor can be found in Annex A.

⁴ Please refer to Annex B for MOH's health advisories and Annex C for MOM's workplace guidelines.

⁵ Includes junior colleges, centralised institute and post-Secondary education institutions.

12 The Workplace Safety and Health Council (WSHC) has also issued a bulletin to its 33,000 subscribers on the revised guidelines in March 2014. In addition, WSHC has been working closely with the various industry associations whose members' employees perform prolonged/ strenuous outdoor work activities, to increase the awareness of both the firms and workers on this issue. The Singapore Contractors Association Ltd (SCAL) has also issued a circular to its members regarding haze management.

13 There is no pre-determined level at which all work would have to be stopped. Essential services would still continue, although appropriate adjustments would be necessary. It is the employers' duty to protect their employees' safety and health at work. All employers should carry out proper risk assessments of their various work activities and implement appropriate measures, to ensure that the risks identified are minimised or mitigated. In situations where the haze poses risks to the safety and health of workers and measures have not been taken to mitigate those risks, MOM may order the affected work to stop.

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About National Environment Agency:

Formed on 1 July 2002, the National Environment Agency (NEA) is the leading public organisation responsible for improving and sustaining a clean and green environment in Singapore. The NEA develops and spearheads environmental initiatives and programmes through its partnership with the People, Public and Private sectors. It is committed to motivating every individual to take up environmental ownership and to care for the environment as a way of life.

By protecting Singapore's resources from pollution, maintaining a high level of public health and providing timely meteorological information, the NEA endeavours to ensure sustainable development and a quality living environment for present and future generations.

About Ministry of Health:

The mission of the Ministry of Health is to be an innovative and people-centred organisation to promote good health and reduce illness, ensure that Singaporeans have access to good and affordable health care that is appropriate to needs, and to pursue medical excellence.

Through MOH, the Government manages the public healthcare system to ensure that good and affordable basic medical services are available to all Singaporeans. We achieve this through subsidised medical services, while promoting individual responsibility for a healthy lifestyle.

For more information, please visit www.moh.gov.sg.

About the Ministry of Education

The Singapore Ministry of Education (MOE) formulates and implements education policies and programmes in consultation with its stakeholders. These policies and programmes aim to help all students discover their talents, realise their potential, and develop a passion for learning that lasts through life. MOE also oversees the development and management of the Government and Government-aided primary schools, secondary schools and junior colleges. Please visit www.moe.gov.sg for more information.

About Ministry of Manpower:

Our vision is to develop a great workforce where Singaporeans can aspire to higher incomes and fulfilling careers. Complementing this is a great workplace where companies are lauded for having outstanding employment practices and organisational cultures.

To achieve this vision, our mission is to improve the skills and productivity of the Singaporean workforce as the basis for better jobs, higher incomes and a secure retirement. We will judiciously supplement our workforce with foreigners, such that they strengthen the Singaporean core. We will also build progressive workplaces, strengthen tripartite relationships and encourage harmonious work cultures so as to create fair and forward-looking employment practices that provide safe and healthy work environments and enable balanced work-life.

Please visit www.mom.gov.sg for more information.

PSI VALUE AND ITS CORRESPONDING AIR QUALITY DESCRIPTOR

PSI Value	Air Quality Descriptor
0 - 50	Good
51 - 100	Moderate
101 - 200	Unhealthy
201 - 300	Very unhealthy
Above 300	Hazardous

MINISTRY OF HEALTH HAZE ADVISORY

The health impact of haze is dependent on one's health status (e.g. whether one has pre-existing chronic heart or lung disease), the PSI level, and the duration and intensity of outdoor activity. Reducing outdoor activities and physical exertion can help limit the ill effects from haze exposure. Persons who are not feeling well, especially the elderly and children, and those with chronic heart or lung conditions, should seek medical attention.

24-hour PSI	Healthy persons	Elderly, pregnant women, children	Persons with chronic lung disease, heart disease
≤100 (Good/Moderate)	Normal activities	Normal activities	Normal activities
101 – 200 (Unhealthy)	Reduce prolonged or strenuous outdoor physical exertion	Minimise prolonged or strenuous outdoor physical exertion	Avoid prolonged or strenuous outdoor physical exertion
201 – 300 (Very Unhealthy)	Avoid prolonged or strenuous outdoor physical exertion	Minimise outdoor activity	Avoid outdoor activity
>300 (Hazardous)	Minimise outdoor activity	Avoid outdoor activity	Avoid outdoor activity

Prolonged = continuous exposure for several hours

Strenuous = involving a lot of energy or effort

Reduce = do less

Minimise = do as little as possible

Avoid = do not do

GUIDELINES FOR EMPLOYERS ON PROTECTING EMPLOYEES FROM THE EFFECTS OF HAZE

Introduction

1 Under the Workplace Safety and Health (WSH) Act, the primary responsibility for ensuring an employee's safety and health at work lies with the employer. Hence, it is incumbent upon employers to carry out a proper risk assessment and to implement appropriate measures, including specifying when to restrict work, so as to ensure that risks identified are minimised or mitigated.

2 This set of guidelines provides employers with general measures to minimise or mitigate the effects of haze on their employees. Additional measures specific to the work requirements and health conditions of the employees should be instituted based on the risk as assessed by the employers. The health effects depend on the severity of the smoke haze as benchmarked against the PSI (Pollutant Standards Index) reading, the health conditions and level of activity of the employee. The PSI stated in these guidelines refer to the revised 24-hour PSI issued by the National Environment Agency (NEA), which is available online at www.nea.gov.sg/psi.

Preparation

3 Following the announcement of an increased risk of haze by NEA, employers should review the following preparations to protect the safety and health of employees against the effects of haze:

- a. Identify susceptible employees⁶
- b. Identify types of outdoor work⁷ to be reduced when there is haze
- c. Determine criteria for restricting outdoor work
- d. Conduct mask fit testing for employees who are still required to work outdoors and ensure sufficient stock of suitable masks
- e. Improve efficiency of air cleaning devices
- f. Implement haze communication system between employer and employees.

Management of outdoor work

4 Depending on the air quality, prolonged⁸ or strenuous⁹ outdoor work should be reduced, minimised or avoided. Risk assessments, taking into account the effects of the haze, individual employee's health and working conditions, should be conducted. Risk mitigating measures should be adopted. Examples of such measures may include:

- a. The use of mechanical aids (e.g. trolleys, hoists) for transporting or carrying heavy objects, instead of manual lifting or carrying.
- b. Adjust work assignments or rotate jobs to shorten the time spent in outdoor work.
- c. Schedule sufficient indoor rest breaks for workers performing outdoor work.

⁶ This refers to employees with chronic heart or lung disease, elderly employees, or pregnant employees. Please refer to the MOH health advisories for further information.

⁷ Outdoor work is work that is carried out outside buildings regularly or most of the time.

⁸ Prolonged = continuous exposure for several hours.

⁹ Strenuous = involving a lot of energy or effort.

- d. Ensure adequate hydration for workers.
- e. Monitor employees' health by encouraging feedback on any symptoms that may occur.
- f. Defer non-essential work.

5 If prolonged or strenuous outdoor work is not avoidable at higher PSI, and an employer still requires an employee to do so due to extenuating circumstances, suitable masks (e.g. N95 masks) should be provided.

6 Employers should bear in mind that the use of masks may increase the effort of breathing especially during physical exertion. For some employees, they may experience discomfort in breathing, tiredness or headache. This may be due to their masks causing increased resistance to breathing, and a reduction in the volume of air breathed. Employers should consider instituting regular breaks, slow down pace of work and encourage hydration of employees using masks. At any time, if employees experience breathing difficulty from wearing masks while working outdoors, employers should deploy them to work indoors where the pollutant concentration may be lower. Risk assessment, taking into account the usage of the masks, individual employee's health conditions and nature of outdoor work should be conducted. Elderly and pregnant employees as well as those with chronic heart/lung disease should consult their doctors on the usage of masks.

7 Additionally, visibility factors should also be taken into account, e.g. risk assessments should be conducted to determine whether outdoor lifting operations involving tower and mobile cranes should cease due to the foreseeable risk of poor visibility, so as not to compromise safety of persons at work. Such work can only be carried out when appropriate precautions have been taken to reduce the risk.

8 Table A provides an overview of the guidelines based on the 24-hour PSI. Employers should note that environmental conditions may fluctuate throughout a work day and factor this into their risk assessments.

Provision of suitable protective equipment

9 It is the duty of employers to provide suitable masks (e.g. N95 masks) to employees where warranted. Factors to consider in the selection of suitable masks including the nature and levels of pollutants, work tasks and conditions, operator-related factors and any accessories used together with the masks. The purpose of the mask is to ensure that users are adequately protected from inhaling the pollutants and the appropriate masks should be selected for use when required. As an example, for particulate matter (PM2.5 and PM10), the correct type of mask is one which is capable of filtering out about 95% of very fine particles, such as N95 mask or equivalent.

10 Employers should ensure that employees who need to wear masks or respirators are fit-tested and that sufficient stock is available. Training should be conducted and supervision provided to ensure correct usage. Masks should be changed when soiled/physically damaged or when the wearer finds it hard to breathe. Reference should be made to the Singapore Standard SS 548:2009: Code of Practice for Selection, use and maintenance of respiratory protective devices.

11 Suitable eye protection (e.g. goggles) should be provided when there is eye irritation. However, interaction with masks should be considered when other personal protective equipment is used.

Enhancing protection for indoor work

12 Please refer to NEA's website for information on how you can improve the air quality for both non air-conditioned and air-conditioned workplaces with the use of suitable air cleaning devices. (<http://app2.nea.gov.sg/anti-pollution-radiation-protection/air-pollution-control/haze/portable-air-cleaners> and <http://app2.nea.gov.sg/anti-pollution-radiation-protection/air-pollution-control/haze/air-cleaning-devices>)

13 To enhance the protection offered by remaining indoors, measures should be taken to reduce haze infiltrating indoor air by keeping windows and doors closed most of the time.

Communication on haze

14 A system should be put in place to update employees regularly on the mitigating measures taken by the organisation to minimise the safety and health effects of haze on employees. The system should include channels for employees to report adverse effects suffered as a result of the haze.

15 For queries on these guidelines, please contact the Ministry of Manpower.
 MOM Contact Centre, Tel: (65) 6438 5122
 Online Enquiry via this [link](https://secure.mom.gov.sg/feedback/) (<https://secure.mom.gov.sg/feedback/>)
 Website: www.mom.gov.sg

TABLE A: OVERVIEW OF GUIDELINES FOR EMPLOYERS ON PROTECTING EMPLOYEES FROM THE EFFECTS OF HAZE

24-Hour PSI	Healthy employees	Elderly, pregnant employees	Employees with chronic lung disease, heart disease	General measures to be taken by employers
≤100 (Good/Moderate)	Normal activities	Normal activities	Normal activities	<ul style="list-style-type: none"> Initiate preparatory measures to protect the safety and health of employees against the effects of haze
101-200 (Unhealthy)	Reduce prolonged or strenuous outdoor work	Minimise prolonged or strenuous outdoor work	Avoid prolonged or strenuous outdoor work	<ul style="list-style-type: none"> Take risk mitigating measures such as use of mechanical aids, job rotation, instituting indoor rest breaks, ensuring adequate hydration etc
201-300 (Very Unhealthy)	Avoid prolonged or strenuous outdoor work	Minimise outdoor work	Avoid outdoor work	<ul style="list-style-type: none"> Take risk mitigating measures such as use of mechanical aids, job rotation, instituting indoor rest breaks, ensuring adequate hydration etc If prolonged or

24-Hour PSI	Healthy employees	Elderly, pregnant employees	Employees with chronic lung disease, heart disease	General measures to be taken by employers
				strenuous outdoor work is not avoidable, and an employer still requires an employee to do so due to extenuating circumstances, masks should be provided
> 300 (Hazardous)	Minimise outdoor work	Avoid outdoor work	Avoid outdoor work	<ul style="list-style-type: none"> • Take additional risk mitigating measures such as job redeployment, reducing the intensity and duration of outdoor work, institute regular breaks or deferment of non-essential jobs. • If outdoor work is not avoidable, and an employer still requires an employee to do so due to extenuating circumstances, masks or appropriate respirators should be provided • Risk assessment should consider the additional risk posed by poor visibility for work activities such as lifting operations involving tower and mobile cranes

Prolonged = continuous exposure for several hours
Strenuous = involving a lot of energy or effort
Reduce = do less
Minimise = do as little as possible
Avoid = do not do