

LOCAL VESSELS ADVISORY COMMITTEE

Control of Smoke Emission from Vessels in the Waters of Hong Kong

Purpose

The purpose of this paper is to seek members' endorsement on the proposals to amend relevant sections under the Shipping and Port Control Ordinance (Cap. 313) and the Merchant Shipping (Local Vessels) Ordinance (Cap. 548) in relation to the controlling of dark smoke emission from vessels within Hong Kong waters.

Background

2. In 2000, the Marine Department (MD) conducted a review to evaluate the situation of air pollution in the marine environment and to look into ways to control dark smoke emission from vessels. The review concluded proper operation and maintenance of engines are the most effective measure for dark smoke reduction and that the extant legislation should be amended to clearly define the quantity and duration of smoke emission that constitutes an offence. The review also recommended that shade 2 on the Ringelmann Chart and a continuous period of 3 minutes should be adopted as the upper limit. At the then Provisional Local Vessel Advisory Committee (PLVAC) meeting held on 3 August 2000, members were informed of the findings and the recommendations made vide PLVAC Paper No. 8/2000 (see **Attachment I**) and the proposal was endorsed.

3. In 2008, to align with the control standards for land-based emissions as set out in the Air Pollution Control (Smoke) Regulations (Cap. 311C), it was proposed that a consistent standard, i.e. shade 1 on the Ringelmann Chart and a continuous period of 3 minutes should be adopted as the upper limit for vessels within Hong Kong waters. The Shipping Consultative Committee, the Port Operations Committee, and the Local Vessels Advisory Committee (LVAC) were consulted. While members of

the Shipping Consultative Committee and members of Port Operations Committee endorsed the proposal, members of LVAC had shown reservation on endorsing the standard of using shade 1 on the Ringelmann Chart to determine the level of dark smoke emission as proposed in LVAC Paper No. 5/2008 (see **Attachment II**) at the meeting held on 24 April 2008.

4. Both section 50 of Cap. 313 and section 51 of Cap. 548 stipulate that it is an offence for a vessel in the waters of Hong Kong to emit smoke in such quantity as to be a nuisance (see **Attachment III**).

Present Situation

5. In 2011 and 2012, MD conducted dark smoke survey and observations were made on 2,862 and 1,442 vessels respectively (see **Attachment IV**). Only one ocean going vessel in 2011 and one local vessel in 2012 were observed with smoke emission of as dark as or darker than shade 2 on the Ringelmann Chart for a continuous period of 3 minutes or more.

6. In September 2012, a further research on control of dark smoke emission from vessels in overseas ports was conducted again in order to provide updated information for reference. The information revealed that in the United Kingdom and the United States, it is an offence for smoke as dark as or darker than shade 2 on the Ringelmann Chart be emitted for more than 3 minutes. Furthermore, a Code of Practice issued under Cap.548 also stipulates that any engine fitted on a locally licensed vessel should be properly maintained at all times so that it is free from dark smoke emission. In this regard, a smoke emission test applying shade 2 on the Ringelmann Chart and a continuous period of 3 minutes as the upper limits has been applied in the engine performance condition check of a local vessel during the final inspection for initial and periodic surveys.

The Proposals

7. Based on the foregoing and the current offence on 'nuisance' is not objectively or clearly defined, in order to support the Government's determination to

improve air quality in Hong Kong, it is proposed that a more objective standard to control dark smoke emission from vessels in the waters of Hong Kong should be adopted in the marine legislation and to make it an offence for a vessel to emit dark smoke which is as dark as or darker than shade 2 on the Ringelmann Chart for 3 minutes or more continuously at any one time.

8. With regard to the maximum penalties for the above offence, as the ratings of engines fitted onboard ocean going vessels are relatively larger than that of local vessels, thus the amount of dark smoke emission would be proportionally more. By the same logic, the fine level as stipulated in section 50 of Cap. 313 should be higher than that in section 51 of Cap. 548.

9. The existing fine for local vessels under section 51 of Cap. 548 at level 3 (viz. \$10000) and for any subsequent offence to a fine at level 4 (viz. \$25000) since its enactment in 2007 was set at a reasonable level. As such, it is proposed that the penalty in Cap. 548 should be maintained. However, the current administrative requirement for locally licensed vessels to undergo an additional inspection on smoke emission if they were caught emitting dark smoke in excess of the above limit should be added to the proposed amendment, which was already endorsed vide the PLVAC Paper No. 8/2000.

10. For ocean going vessels under section 50 of Cap. 313, the current fine of \$10000 for a first offence and \$20000 for subsequent offence has been used for some 15 years. Given that public aspirations on curbing smoke emission have raised over time and the amount of smoke emitted by ocean going vessels is greater than local vessels, it is proposed that the fine should be revised to level 4 (viz. \$25000) for a first offence and level 5 (viz. \$50000) for subsequent offence to enhance deterrent effect.

11. To in line with the interpretation of “ship¹” in section 2 of Cap. 313, the word “vessel” in section 50(1) and (2) is proposed to be replaced by “ship” for demarcation with Cap. 548.

¹ “ship” under Cap. 313 means any vessel used in navigation other than a local vessel or a junk.

Proposed Legislative Amendments

12. Legislative amendments are proposed to amend the following relevant sections (see **Attachment III**) under the Shipping and Port Control Ordinance (Cap. 313) and the Merchant Shipping (Local Vessels) Ordinance (Cap. 548) :-

<u>Shipping and Port Control Ordinance (Cap. 313) -</u>		
<u>Item</u>	<u>Section</u>	<u>Provisions required</u>
(1)	s50(1) and s50(2)	Replace the word “vessel” by “ship”.
(2)	s50(3)	Replace existing subsection (3) by the following: <i>“(3) If subsection (1) is contravened, the owner, his agent and the master of the ship commit an offence and each of them is liable to a fine at level 4 and for any subsequent offence to a fine at level 5.”</i>
(3)	s50(4) (new)	Insert the following as a new subsection (4): <i>“(4) The Director or an authorised officer may give a direction to the owner, his agent or the master of the ship to take necessary action to avoid emitting dark smoke in excess the limit specified in subsection (1).”</i>
(4)	s50(5) (new)	Insert the following as a new subsection (5): <i>“(5) The owner, his agent or the master of the ship, who without reasonable excuse fails to comply with a direction given to him under subsection (4) commits an offence and is liable to a fine at level 2.”</i>
(5)	s50(6) (new)	Insert the following as a new subsection (6): <i>“(6) For the purpose of subsection (1) “Nuisance” means smoke</i>

		<i>which, if compared in the appropriate manner with the Ringelmann Chart, as an approved device, would appear to be as dark as or darker than shade 2 on the Ringelmann Chart for 3 minutes or more continuously at any one time.</i>
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<u>Merchant Shipping (Local Vessels) Ordinance (Cap. 548) -</u>		
<u>Item</u>	<u>Section</u>	<u>Provisions required</u>
(6)	s51(4) (new)	<p>Insert the following as a new subsection (4):</p> <p><i>“(4) The Director or an authorised officer may give a direction to the owner, his agent or the coxswain of the vessel to require them to deliver the vessel to the Director for inspection if the vessel is caught for emitting dark smoke in excess the limit specified in subsection (1). The owner, his agent or the coxswain of the vessel is required to pay for the re-inspection fee as prescribed under the Merchant Shipping (Local Vessels) (Fees) Regulation (Cap.548J).”</i></p>
(7)	s51(5) (new)	<p>Insert the following as a new subsection (5):</p> <p><i>(5) The owner, his agent or the coxswain of the vessel, who without reasonable excuse fails to comply with a direction given to him under subsection (4) commits an offence and is liable to a fine at level 2.”</i></p>
(8)	s51(6) (new)	<p>Insert the following as a new subsection (6):</p> <p><i>“(6) For the purpose of subsection (1) “Nuisance” means smoke which, if compared in the appropriate manner with the Ringelmann Chart, as an approved device, would appear to be as dark as or darker than shade 2 on the Ringelmann Chart for 3 minutes or more continuously at any one time.”</i></p>

Advice Sought

13. Members are invited to offer their comments on the above proposals and proposed legislative amendments.

Dangerous Goods and Prosecution Section

Operation Branch

Port Control Division

Marine Department

February 2013

Provisional Local Vessel Advisory Committee

Review of the Control of Smoke Emission from Vessels

Purpose

1. The purpose of this paper is to seek members' endorsement of the recommendations appended in paragraph 7.

Background

2. To address the public concern on air quality in Hong Kong, the Marine Department (MD) undertook a review to evaluate the situation of air pollution in the marine environment, review the control of smoke emission from vessels, and explore ways to lessen dark smoke emission within her purview.

Present Situation

3. On land, the Environmental Protection Department (EPD), together with the Transport Department (TD) and the Hong Kong Police Force (HKPF) are imposing stringent measures to control emission of dark smoke from vehicles. These measures include taking prosecution action against vehicle owners and ordering them to present their vehicles for smoke testing, and retesting until the vehicles concerned pass the smoke emission standard stipulated. EPD is also taking parallel action on chimneys or relevant plants on land. As it is impracticable to use a measuring device, trained spotters will use a smoke colour/shade comparison scale known as "Ringelmann Chart" (See Annex I) to determine whether the installations concerned emit excessive dark smoke.

4. From time to time, MD has received complaints about vessels emitting dark smoke and special operations were mounted in an attempt to prosecute polluters. However, the prosecution action has not always been successful as the extant provision in the Shipping and Port Control Ordinance is a bit vague in defining the circumstance, quantity of smoke and duration of emission that constituting an offence.

5. In the course of the review, a study has been made on other major ports around the world on their experience and what they had been doing to tackle the smoke emission issue. It is learnt that the majority of them handle the issue when the emission is causing a nuisance or problem to the public, on a case by case basis which is similar to that of ours. It is also noted that some ports have engaged the Ringelmann Chart to determine the level of dark smoke emission.

Conclusion of the Review

6. After analysing various preventive and control measures, the review concluded that proper operation and maintenance of engines are the most effective measure for dark smoke reduction and that the extant legislation should be amended to clearly define the quantity and duration of smoke emission that constituting an offence.

Recommendation

7. Taking into consideration the conclusion of the review and the measures taken by EPD, TD, HKPF and other port authorities, it is recommended that :

- i) MD should, in addition to continuing to combat smoke nuisance, use Ringelmann Chart as reference to measure the extent of dark smoke emission. In this regard, Shade 2 of the Ringelmann Chart and a continuous period of 3 minutes should be adopted as the upper limit. In other words, any smoke emission darker than the Shade 2 for more than 3 minutes would constitute an offence. This new requirement would be made under the Shipping and Port Control Regulations, Cap. 313, and the proposed Merchant Shipping (Local Vessels) (General) Regulation, Cap. 548.
- ii) The current administrative requirement for locally licensed vessels to undergo smoke test during their statutory periodical inspection (survey) should be codified in the legislation. To encourage owners and coxswains to carry out proper maintenance of their vessels, an additional inspection would be required if they were caught emitting dark smoke in excess of the above limit. This new requirement would be made under the proposed Merchant Shipping (Local Vessels) (General) Regulation, Cap. 548.
- iii) The examination syllabuses of local certificates of competency should be expanded to place more emphasis on proper operation and maintenance of engines to reduce dark smoke emission. In parallel, MD should also continue to conduct educational seminars with the floating community and shipping companies, putting more weight on the reduction of dark smoke emission.

Presentation

8. This paper will be presented to members by Mr. F. L. Cheuk, Senior Marine Officer/Legislation and Prosecution.

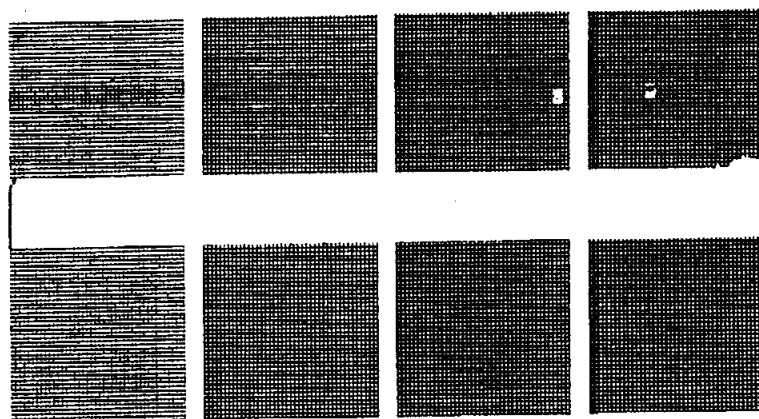
Vessel Traffic Services Branch

Marine Department

July 2000

Ringelmann Chart

力高文圖表



No.1
1號

No.2
2號

No.3
3號

No.4
4號

Micro-Ringelmann Chart

微型力高文圖表



LOCAL VESSELS ADVISORY COMMITTEE

Control of Smoke Emission from Vessels in the Waters of Hong Kong

[for consultation with members of the Local Vessels Advisory Committee]

Purpose

This paper is to seek members' endorsement on the proposal to introduce new provisions under the Shipping and Port Control Regulations (Cap.313A) and the Merchant Shipping (Local Vessels) (General) Regulation (Cap. 548F) to control dark smoke emission from vessels in the waters of Hong Kong.

Background

2. Deterioration of air quality in recent years has become a major concern in Hong Kong. In 2000, the Marine Department conducted a review to evaluate the situation of air pollution in the marine environment, reassess the control measures for dark smoke emission from vessels, and in general explore ways to minimize pollution from this source. Members were informed of the findings and recommendations of the review via PLVAC Paper No.8/2000 and the paper was endorsed at the 25th PLVAC meeting held on 3 August 2000.

Present Situation

3. At present, section 50 of the Shipping and Port Control Ordinance, Cap. 313 and section 51 of the Merchant Shipping (Local Vessels) Ordinance, Cap 548, stipulate that it is an offence for a vessel in the waters of Hong Kong to emit smoke in such quantity as to be a nuisance. Since the previous consultation in 2000, the department has taken forward the recommendations of the review progressively. MD patrol officers have adopted a more objective standard of Shade 2 on the Ringelmann Chart¹ as a reference for

¹ "Ringelmann Chart" means a shade chart as defined in the Air Pollution Control (Smoke) Regulations (Cap. 311C). A copy of the chart is provided at Annex for reference purpose.

measurement at any one time the emission of dark smoke for a continuous period of more than 3 minutes. Further, a Code of Practice issued under the Merchant Shipping (Local Vessels) Ordinance (Cap.548) also stipulates that any engine fitted on a vessel should be properly maintained at all times so that it is free from dark smoke emission. In this regard, a smoke emission test applying Shade 2 of the Ringelmann Chart and a continuous period of 3 minutes as the upper limits has been included in the engine performance condition check during the final inspection for initial and periodic surveys. Observations indicate that today most vessels do not emit any visible smoke during operations, however stricter regulation is required for vessels that do.

4. To support the Government's determination to improve air quality in Hong Kong and to align with the prevailing control standards for land-based emissions as set out in the Air Pollution Control (Smoke) Regulations (Cap. 311C), it is now proposed that a consistent standard to control dark smoke emission from vessels in the waters of Hong Kong should be adopted in the marine legislation and to make it an offence for a vessel to emit dark smoke which is as dark as or darker than Shade 1 on the "Ringelmann Chart" for more than 3 minutes continuously at any one time.

Proposal

5. Legislative amendments are proposed to incorporate the following provisions into the Shipping and Port Control Regulations (Cap. 313A) and the Merchant Shipping (Local Vessels) (General) Regulation (Cap. 548F):

- (i) A provision to specify that any vessel is prohibited from emitting dark smoke which is as dark as or darker than Shade 1 on the "Ringelmann Chart" for more than 3 minutes continuously at any one time.
- (ii) A provision to specify that it is an offence for contravention of the provision proposed at sub-paragraph (i) above. The owner, his agent or the coxswain of the vessel concerned should be held responsible for the offence and be liable to a fine at level 2 (i.e. \$5,000). It would be a defence that the dark smoke is emitted for safety of life or of the vessel.
- (iii) A provision to specify that the Director of Marine may give a direction / notice to the owner, his agent or the master of the vessel concerned to require them to take necessary action to

avoid emitting dark smoke in excess of the limit specified in sub-paragraph (i) above.

- (iv) A provision to specify that it is an offence for not complying with the direction / notice given under sub-paragraph (iii) above. The owner, his agent or the master of the vessel concerned should be held responsible for the offence and be liable to a fine of level 2 (i.e. \$5,000).

Recommendation

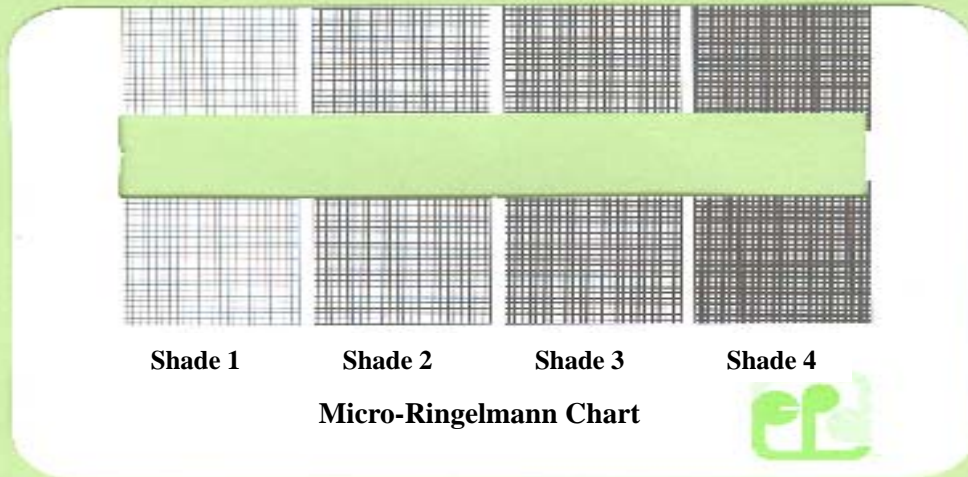
- 6. Members are invited to endorse the proposal set out in paragraph 5 above.

Presentation

- 7. Mr. K C Chan, Senior Marine Officer/Legislation and Prosecution of the Marine Department will present this paper to members.

Operations Branch
Marine Department
10 April 2008

Ringelmann Chart



For best results, use this chart according to the following instructions:



1. Hold chart at arm's length and view smoke through slot provided.
2. Be sure that the light shining on chart is the same light that is shining on smoke being examined; for best results, sun should be behind observer.
3. Match smoke as closely as possible with corresponding grid on chart.
4. Enter density of smoke (designated by numbers under each grid) on record sheet; also enter time of each observation.
5. Repeat observations at regular intervals of 1/4 or 1/2 minute.
6. Note and record distance to stack, duration of smoke emissions, weather conditions and sky background.

Chapter: 313 Title: **SHIPPING AND PORT Gazette**
CONTROL Number:
ORDINANCE
Section: 50 Heading: **Emission of smoke from** Version Date: 30/06/1997
vessels

- (1) Subject to subsection (2), no vessel in the waters of Hong Kong shall emit smoke in such quantity as to be a nuisance.
- (2) Subsection (1) shall not apply to the emission of smoke in circumstances affecting the safety of life or of the vessel.
- (3) If subsection (1) is contravened, the owner and master of the vessel commit an offence and each of them is liable for a first offence to a fine of \$10000 and for a second or subsequent offence to a fine of \$20000.

Chapter: 548 Title: **MERCHANT** Gazette L.N. 282 of
SHIPPING (LOCAL Number: 2006
VESSELS)
ORDINANCE
Section: 51 Heading: **Emission of smoke from** Version Date: 02/01/2007
local vessel

- (1) Subject to subsection (2), no local vessel in the waters of Hong Kong shall emit smoke in such quantity as to be a nuisance.
- (2) Subsection (1) shall not apply to the emission of smoke in circumstances affecting the safety of life or of the vessel.
- (3) If subsection (1) is contravened, the owner of the local vessel, his agent and the coxswain of the vessel commit an offence and each of them is liable on conviction for a first offence to a fine at level 3 and for any subsequent offence to a fine at level 4.

Figures showing the smoke emission duration in 2011

		under 1 min.	1 min ~ 1 min 59 secs	2 mins ~ 2 mins 59 secs	3 mins and above
Shade 1	OGV	5	31	20	2
	RTV	28	17	5	
	LV	95	42	17	2
Shade 2	OGV			2	
	RTV		3	1	
	LV	6	5		
Shade 3	OGV				1
	RTV				
	LV				
Shade 4	OGV				
	RTV				
	LV				

(observations on 2,862 vessels)

Figures showing the smoke emission duration in 2012

		under 1 min.	1 min ~ 1 min 59 secs	2 mins ~ 2 mins 59 secs	3 mins and above
Shade 1	OGV	4	3	1	1
	RTV	1			
	LV	2			
Shade 2	OGV	1			
	RTV				
	LV				1
Shade 3	OGV				
	RTV				
	LV				
Shade 4	OGV	1	2		
	RTV				
	LV				

(observations on 1,442 vessels)

Notes:

OGV = Ocean Going Vessels

RTV = River Trade Vessels

LV = Local Vessels