

Guide to WSH (MHI) Regulations

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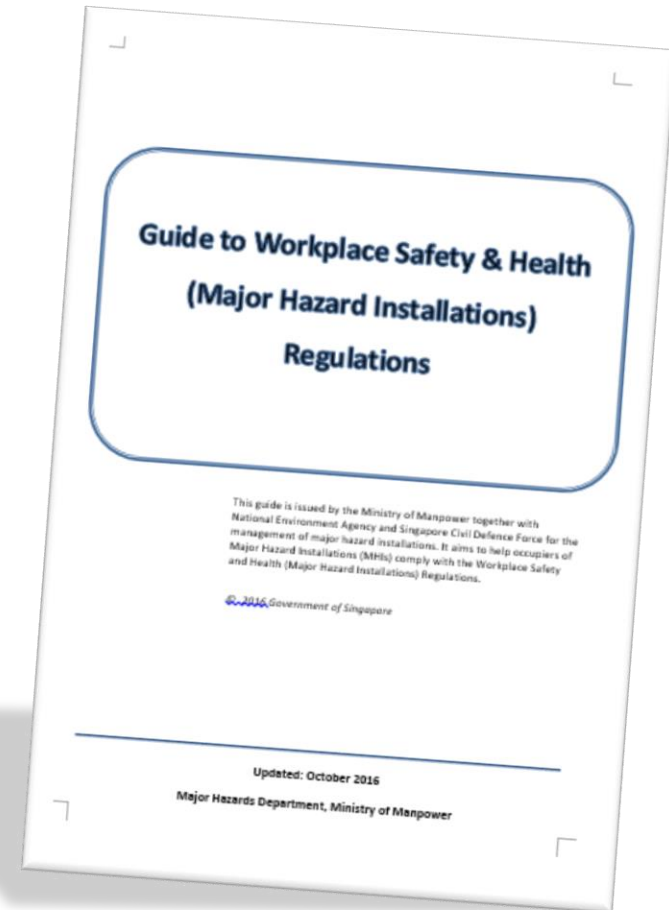
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About the Legal Guide

- Key legal provisions & underlying principles
- Work processes for MHIs in Safety Case regime
- Complements other guides:
 - ✓ Safety Case Technical Guide
 - ✓ Safety Case Assessment Guide
 - ✓ Guide to Determine Quantities of Dangerous Substances



Available from MHD's website (*Nov 2016 onwards*):

<http://www.mom.gov.sg/workplace-safety-and-health/major-hazard-installations>



Definitions

Major Hazard Installation (MHI)

1. Premises engaging in processing, manufacturing and/or bulk storage of dangerous substances
2. Inventory of dangerous substances meeting or exceeding threshold quantities

Basis of definition:

Increased potential for occurrence of major accidents, hence deemed as MHIs

Definitions

Major Accident

- An occurrence arising from **one or more uncontrolled developments** in the course of any operation or work being carried out within an MHI
- **Involving one or more dangerous substances**, resulting in **death or serious harm**, whether or not within the MHI, and includes a major emission, fire or explosion

“serious harm” means –

- (a) an **injury to one or more persons** which is life-threatening, causes a long-term health effect or results in a permanent disability; or
- (b) a **substantial number** of persons requiring medical attention.

MHI Registration Process

1

MHI Application

Submit MHI application & assessment forms

2

Safety Case Preparation

Upon confirmation of MHI status, MHI to prepare SC according to SC Technical Guide

3

Pre-receipt meeting

Mandatory meeting between MHI and MHD, to align Safety Case contents

4

Safety Case Submission

Safety Case to be submitted for MHD's assessment

5

Issue MHI Certificate of Registration

Certificate issued upon payment of registration fees

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Application as an MHI

Date	Oct – Dec	By Dec	Sep
	2016		2017
Activity	<p>Companies to submit application and assessment forms, when notified by MHD</p> <p>(After enactment of WSH (MHI) Regs)</p>	<p>Confirmation of MHI status</p> <p><u>MHIs</u></p> <p>Notified of Safety Case submission date & details of provisional MHI certificate</p>	<p>WSH (MHI) Regulations takes effect</p> <p>Provisional MHI certificate to take effect, replacing current Factory certificate</p>
Action via	Email	Letter	-

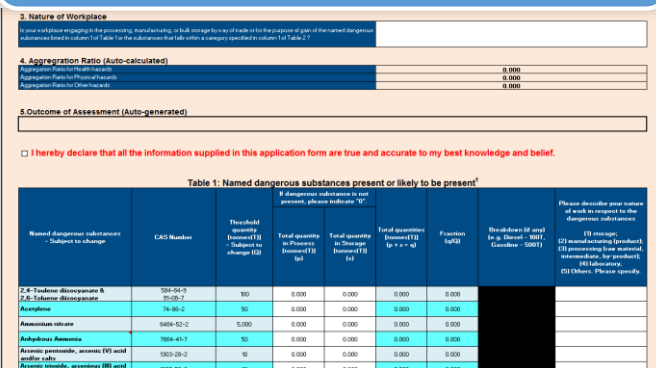
- Transition of licences from current Factory registrations
- Existing MHIs to continue operations

Application as an MHI

1. MHI Application form



2. MHI Assessment form



3. Nature of Workplace
 Is your workplace engaged in the processing, manufacturing, or bulk storage by way of trade or for the purpose of sale of the named dangerous substances listed in column 1 of Table 1? ☐ Yes ☐ No

4. Aggregation Ratio (Auto-calculated)
 Aggregation Ratio for Health Hazards: 0.000
 Aggregation Ratio for Physical Hazards: 0.000
 Aggregation Ratio for Other Hazards: 0.000

5. Outcome of Assessment (Auto-generated)
☐ I hereby declare that all the information supplied in this application form are true and accurate to my best knowledge and belief.

Table 1: Named dangerous substances present or likely to be present¹

Named dangerous substances Subject to storage	CAS Number	Threshold Quantity (tonnes) Subject to storage (t)	If dangerous substances are present, please indicate "Y"		Total quantity of Present Substances (t) (p)	Total quantity of Storage Substances (t) (s)	Total aggregation Ratio (t) (p + s = a)	Fraction 100%	Thresholds of limit for p, s, a and a (tonnes) - 500t, (tonnes) - 500t	Please describe your nature of work in respect to the dangerous substances: (1) storage; (2) manufacturing/production; (3) processing raw material, intermediate, or product; (4) laboratory; (5) others. Please specify.
			Total quantity of Present Substances (t) (p)	Total quantity of Storage Substances (t) (s)						
2,4-Toluene diisocyanate & 2,6-Toluene diisocyanate	505-90-2 91-08-2	100	0.000	0.000	0.000	0.000	0.000			
Acrylonitrile	74-96-2	50	0.000	0.000	0.000	0.000	0.000			
Acrylonitrile	4964-50-2	0.000	0.000	0.000	0.000	0.000	0.000			
Acrylonitrile	7896-49-7	50	0.000	0.000	0.000	0.000	0.000			
Acrylonitrile, acrylonitrile (N) and acrylonitrile	1050-29-2	10	0.000	0.000	0.000	0.000	0.000			
Acrylonitrile, acrylonitrile (N) and acrylonitrile	1050-29-2	10	0.000	0.000	0.000	0.000	0.000			

- Submit MHI assessment form in excel (.xls)
- Based on submitted form, MHD will confirm your status as MHI or otherwise
- Uncertain about your MHI status? Did not receive email from MHD? Email contact_MHD@mom.gov.sg asap.

Resources

Guide to determine quantities of dangerous substances

Reference list of dangerous substances

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Safety Case Preparation

- MHIs are advised to start preparation of their Safety Cases, ahead of MHD's official confirmation
 - MHD had earlier on, conducted early sensing with the MHI Survey form in 2015
 - Workplaces that are likely deemed as MHIs should commence preparation
- Embarking on preparation earlier allows more time to meet or exceed criteria stated in the Safety Case Assessment Guide

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Pre-Receipt Meeting

- **6 months** before Safety Case submission dateline
- Alignment with MHD:
 - ✓ Descriptive information for your facility
 - ✓ Predictive Aspects - methodology and selection of :
 - Major Accident Scenarios (MASs);
 - Representative set of MASs;
 - Safety Critical Events (SCEs)
 - ✓ ALARP* methodology and ALARP demonstration of 1 SCE



* As low as reasonably practicable

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Safety Case Submission

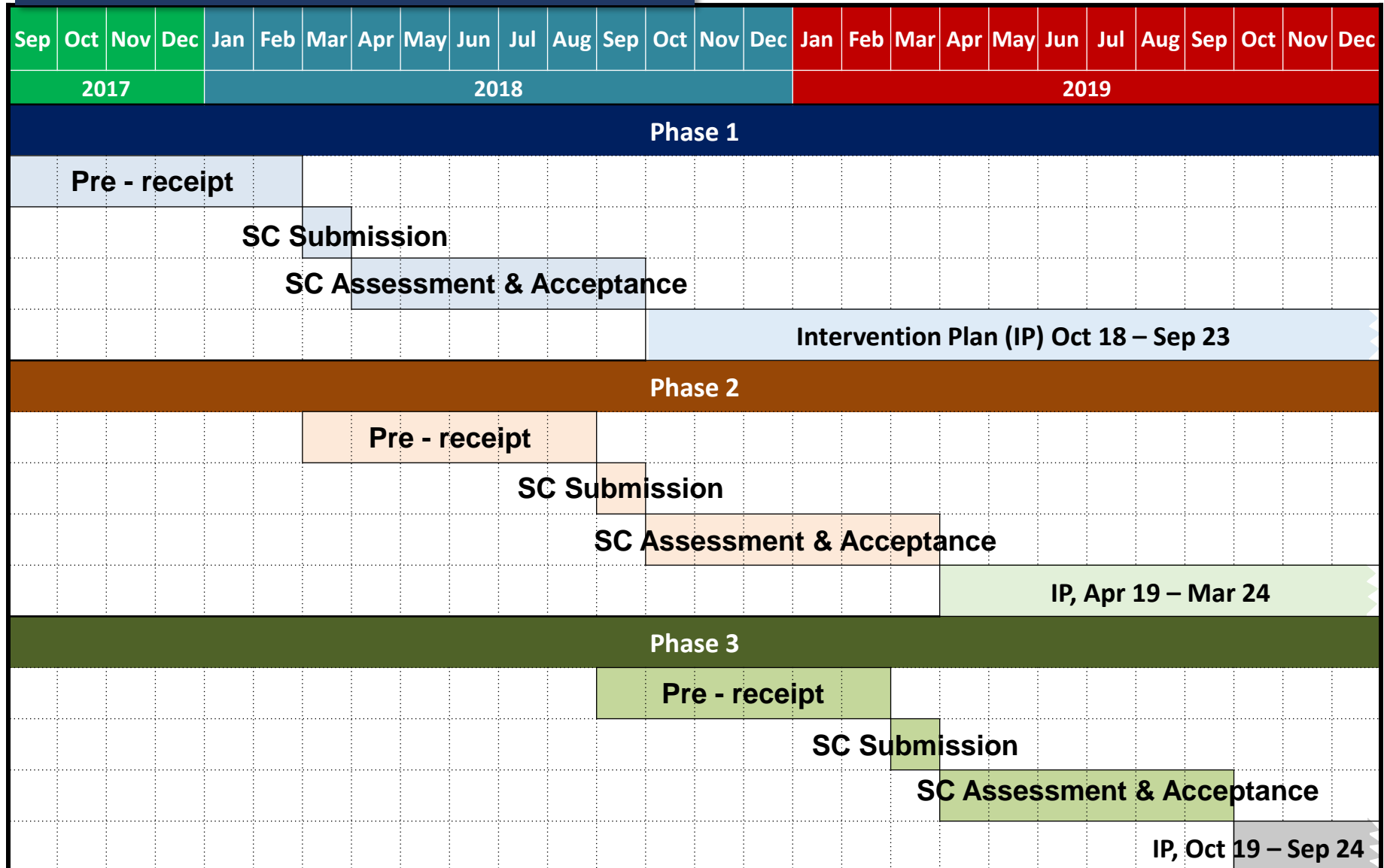
- MHD will inform existing MHIs of submission dateline for existing MHIs, as stipulated by WSH Commissioner
- For new MHIs, safety case submission is **6 months** before planned commissioning date



* Proposed Intervention Priorities & Intervention Plan

- Existing MHIs are distributed into **3 phases** to submit their SC based on a risk-based approach:
 - ✓ Nature of business & dangerous substances inventory
 - ✓ Past track record

Safety Case Submission



* Safety case activities will also apply to new MHIs and begin upon engagement with MHD

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Issue MHI Cert of Reg

Once Safety Case is accepted by MHD,

- ✓ MHI will be notified to make a **payment** for MHI Registration Fees via LicenceOne <https://licence1.business.gov.sg>
- ✓ MHI Certificate of Registration will be issued, **valid for 5 years**
- ✓ MHI Certificate of Registration will replace Provisional MHI Registration



MHI Registration Fees

- ✓ One-time processing fee per registration, calibrated by risk-based approach

Classes of MHIs	Sum of Aggregated Ratio, X	Registration Fees (S\$)	
		2017 – 2020	2021 onwards*
Storage of DS in warehouses	$X \leq 50$	4,550	9,100
	$50 < X \leq 100$	8,300	16,600
	$X > 100$	12,800	25,600
Bulk storage of DS	$X \leq 5$	4,550	9,100
	$5 < X \leq 100$	8,300	16,600
	$X > 100$	12,800	25,600
Manufacturing or processing of DS	$X \leq 5$	4,550	9,100
	$5 < X \leq 50$	8,300	16,600
	$X > 50$	12,800	25,600

50% ↓

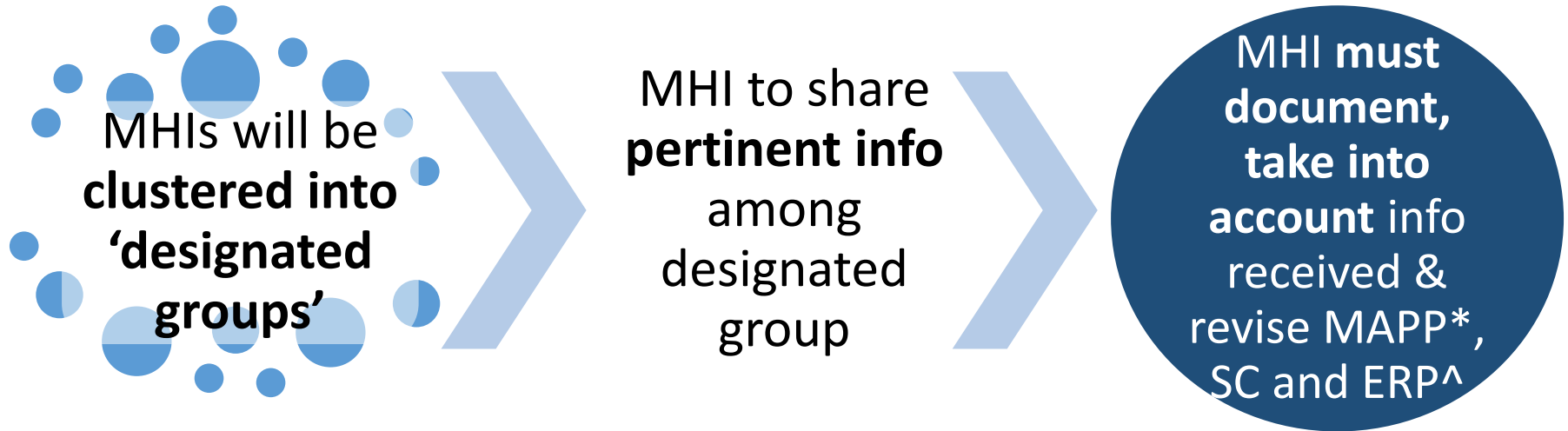
* Fees are paid once every 5 years

* Fees may be subject to revision in 2021 (5 years after enactment), based on adjustment rates



Provision of Information

Main objective: Enhanced management of potential domino effects



- WSH Commissioner may also direct info sharing to other workplaces within designated group for hazard communications, increasing awareness of **affected parties**
- After any major revision of Safety Case, MHI must provide revised information to required parties **within 14 days**

* Major Accident Prevention Policy

^ Emergency Response Plan

Provision of Information

Pertinent info:

- Common name(s) of dangerous substance and its principal characteristics
- Nature of the major accident hazards and potential off-site effects
- Means of communications to and advice on recommended actions

Cumulative escalation scenarios

- Largest harm distances (geographically represented **Worst Case Scenarios**) for
 - ✓ Thermal radiation from fire – 20kW/m^2
 - ✓ Overpressure from explosion – 2psi
- MHI could also justify to MHD that the above info need not be provided, with evidence that cumulative escalation is impossible

- 20kW/m^2 may cause thermal stress to unprotected steelwork, resulting in damage
- 2psi may damage piping and sensitive equipment such as atmospheric tanks

Safety Case Review

MHIs shall maintain or review Safety Cases

- ✓ For **renewal of MHI Cert. of Reg.**, once **every 5 years**
- ✓ **With any material change leading to significant repercussions:**
 - New facts or knowledge in relation to major accidents
 - Safety & Health Management System (SHMS)
 - Modifications to MHI

Examples:

New Facts or Knowledge	Changes to SHMS
Incidents or emerging trends which reveal loss of containment scenarios not previously considered	Changes in policies in connection with major accidents

Safety Case Review

- For **modifications**,
 - ✓ Operation of any modified units shall not start until the conclusion of Safety Case assessment
 - ✓ Does not trigger renewal of existing MHI certificate

Examples :

- ✓ Changes in processes (e.g. new production campaign)
- ✓ Debottlenecking, expansion projects
- ✓ A change in the nature or quantities of a dangerous substance that will significantly change the risk profile of the MHI



Incident Notification & Reporting

- Notification and reporting of process-related incidents to follow current incident reporting requirements via *iReport*

For MHIs:

- An incident in connection with **production, distribution or storage of dangerous substances** within an MHI which results in
 - ✓ **Unintended** explosion or fire causing in damage to property, death or bodily injury to a person
 - ✓ **Unplanned or uncontrolled discharge** of dangerous substances

Examples:

Unplanned discharge	Uncontrolled discharge
Loss of containment from <u>primary</u> containment	Situations where protective or mitigation systems were not designed or not functioning to allow safe discharge of dangerous substances

Incident Notification & Reporting

Examples of Reportable Qty adapted from API 754	Quantity of DS Discharged	
	H1 Acute Toxic	0.5 kg
	P1a Explosives	2.5 kg
	P2 Flammable Gases	50 kg
	P5c Flammable Liquids	1000 kg

Examples of process-related incidents that do not require reporting:

- ✓ Discharge of DS to a functional flare system, which is able to abate the release
- ✓ Common utilities-related (e.g. water, steam) incidents
- ✓ Small leak from a sampling line

MHIs must adhere to reporting requirements of accidental release under the licensing conditions of SCDF's P&FM Licence and NEA's HS Permit

A Summary...

- Key features and work processes of the Safety Case Regime under WSH (MHI) Regulations
 - ✓ Registration of MHI
 - Transition plans for existing MHIs
 - ✓ Safety Case review
 - Periodic or change driven
 - ✓ Provision of Information
 - ✓ Notification and reporting of process-related incidents



Further information and updates can be found on MHD's website:
<http://www.mom.gov.sg/workplace-safety-and-health/major-hazard-installations>

Email: Contact_MHD@mom.gov.sg

Thank You!



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