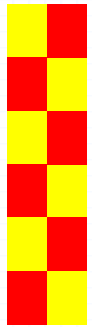




SCDF

The Life Saving Force

... for a safer Singapore



IN-PLACE PROTECTION (IPP) FOR THE WORKPLACE

Official Open



Scope

- What is In-Place Protection (IPP)
- Importance of IPP
- Possible Scenarios
- Developing an IPP Plan for workplace



What is In-Place Protection

- Similar concept in keeping out dust and noise



↳ Involves seeking shelter in an interior room **with minimal openings**. Shutting **all** windows and doors

- Minimise infiltration of exterior air



- In-place protection (IPP) includes additional precautions

↪ e.g. switching off ventilation system



↪ e.g. sealing louvre windows or openings of similar design



What is In-Place Protection

- Concept rolled out to the public in Sep 2003
- Targeted at residential premises



SAFE FROM CHEMICAL HARM

HERE are some frequently asked questions on In-Place Protection (IPP).

Is sealing the room an effective protection against hazardous chemical vapours?

Studies here and overseas have shown that closing windows and doors and shutting off air-conditioning units, coupled with temporary sealing, improves protection against toxic vapours.

Will we run out of air in the sealed room?

IPP is meant to be in place for only about four hours, by which time the chemical vapours outside should

have reached safe levels.

What if we need to conduct IPP in the office or in school?

As the concept is new, current efforts will focus on educating people about IPP. The procedure in other premises is essentially the same. The Singapore Civil Defence Force will work with building managements and schools to develop guidelines on implementing IPP in their buildings.

Why are masking tape and plastic sheets used?

These are recommended as they are commonly used and the materials

resist vapours.

The tape and the sheets, or tra bags, can be easily applied to create an airlock in a room to keep out hazardous vapours. These materials are also easy to remove once it is safe to do so.

Aren't gas masks more effective?

Gas masks may protect wearers from inhaling chemical vapours, but not from exposure to strong chemical agents which can be absorbed through the skin. Until the threat is over, staying in a properly sealed room gives more practical all-round protection.

Case Study

- **IPP implemented in past incidents....**

- **Lake Charles, Louisiana, Aug 27, 2020**

Incident - Chlorine release due to fire at a chemical plant.

Lessons - Residents within the affected area were instructed to stay indoors. No fatalities or injuries due to the chemical fire were reported.



Case Study

- **IPP implemented in past incidents....**

- **Atchison, Kansas on Oct 21, 2016**

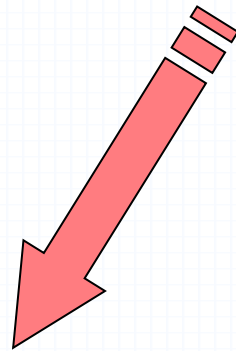
Incident – Mixing of incompatible chemicals resulting in the release of chlorine cloud.

Lessons - Thousands of community members ordered to shelter-in-place. Some who were outdoors and exposed to the chemical sought medical attention due to headache and sore throat. Therefore, it was safer to stay indoors.



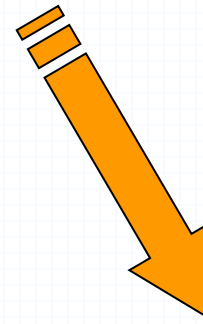
Types of Protective Action

Public Protective Action



Evacuation

- Executed through Fire Emergency Plan (FEP)



IPP

- Executed through In-Place Protection Plan (IPP Plan)

IPP vs Evacuation

The decision to implement IPP rather than evacuation during a chemical emergency will be driven by the following considerations:

- 1) Potential for exposure to people being evacuated
- 2) Instantaneous, short plume duration
- 3) Vulnerable populations that cannot be evacuated readily (eg. Hospitals and nursing homes)
- 4) Affected area with high population density (in the region of thousands)

Note: Mass evacuation is a complex procedure requiring substantial hours to complete, massive resources to move people, perfect cooperation and understanding from the people



When to Implement IPP

Notification to Conduct IPP

In the event of a chemical incident, you will be notified by the authority to adopt in-place protection through

- ↪ Public Warning System (PWS)
- ↪ Free-to-air Mediacorp TV channels and radio stations
- ↪ SMS-based Public Alert System
- ↪ SGSecure mobile app
- ↪ Door-to-door notification



Workplace vs Residential

Aspects	Workplace	Residential
Occupancy	Voluminous	Small numbers
Transient Population	Present	Absent
Building Structure	Complex	Simple
Mechanical Ventilation Systems	Complex	Natural ventilation/ air-condition
Announcement	System to notify all occupants	Shout across the room
Accountability System	Need to establish	Intuitive
Drills	Need to conduct drills	Simple

Guidelines

- Step 1 : Know your building/work premises
- Step 2 : Develop IPP plan
- Step 3 : Conduct IPP drills




Guidelines

■ Step 1 : Know your building/work premises

(1) Ventilation System

 What is the type of ventilation system?

 Is the building connected to other buildings, passageways, and tunnels?

 Determine if there are smoke purge fans

(2) Switches that control air-handling units

⚡ Building Automation System (BAS)-
Commercial Premises

⚡ Fire Command Centre

(3) Location of 'Safe Haven' (Industrial Premises)



Guidelines

Building Information

Building Name		No. of Storeys	
Owner's Name		Telephone No.	
FSM's Name		Telephone No.	
Building Address		Occupant Load	
Correspondence Address (If different from above)		Gross Floor Area	
Office Block		Car Park	
Main Plant Room		AHU	
Controls Switches of air-con plants		Fresh air intake	



Guidelines

- **Step 2 : Develop IPP plan**
 - ✓ Format modeled after Fire Emergency Plan
 - ✓ Contents include :
 - (1) Objective
 - (2) IPP Committee
 - (3) Signal for Initiation of IPP
 - (4) IPP Procedures
 - (5) Actions to be taken
 - (6) Duties and Responsibilities
 - (7) IPP Drills



Develop IPP Plan

Objective

- Safeguard human lives in the event of hazardous release
- Establish duties and responsibilities to ensure systematic and orderly implementation



Develop IPP Plan

IPP Committee

- a. Co-ordinator/Asst. Co-ordinator
- b. Receptionist/Information counter staff
- c. Mechanical Ventilation Operator
- d. IPP Warden/Asst. IPP Warden
(the Fire Warden can be assigned as the
IPP Warden)
- e. Chief Security Officer



IPP Procedures

The basic steps are:

- Shut all windows, doors, blinds/curtains and openings
- Turn off machinery and lights to minimise heat generation
- Turn off all air handling equipment (e.g. air conditioning) to avoid drawing in air from outside
- Grab some cloths/big towels and tapes
- Choose a room (or rooms) with minimal windows/exterior openings
- Use cloths/towels to seal off gaps between the door and floor
- Close all windows in the room. If there are louvre windows (or openings of similar design), seal the gaps with commonly found items such as cloths/towels or tapes
- Tune in to the free-to-air MediaCorp TV and radio stations or SCDF's social media platforms for updates on the latest situation and/or instructions from the authorities
- Leave the room only when instructed by the authorities



Develop IPP Plan

Actions To Be Taken

Action By	Actions to be taken
Co-ordinator	Initiate activation of IPP
Announcer	Make announcement through Public Address Sys
Mechanical Ventilation Operator	Shut down all air handling units
IPP Warden	Direct Staff to IPP rooms and conduct roll call
Chief Security Officer	Close all entrances and place signage
All Staff	Shut down machinery and proceed to IPP rooms

Guidelines

Signal / Announcements to Commence IPP

- Use of Public Address System
- Useful statements to include in the announcements:
 - ▶ An In-Place Protection advisory has been issued
 - ▶ **DO NOT** leave the building. The air outside is not safe.
 - ▶ The ventilation and air-conditioning systems **will be shutdown** to minimise infiltration of air from outside.
 - ▶ Close windows and doors and turn off unnecessary machinery and lights to **minimise heat generation**.



Develop IPP Plan

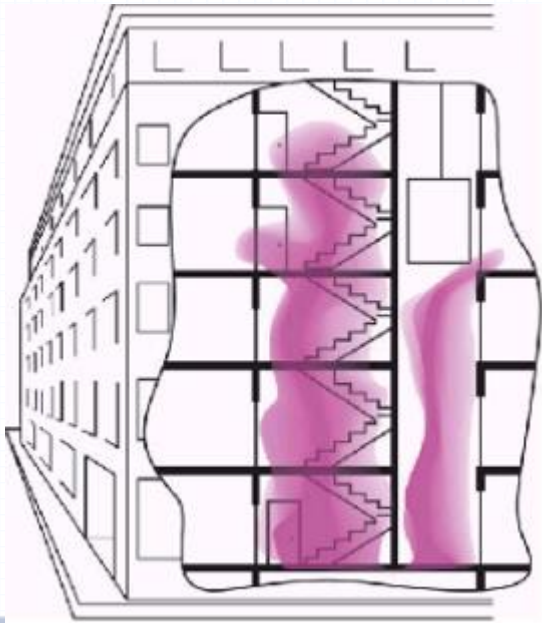
- **Mechanical Ventilation & AHUs**
 - ✓ To include Step-by-step instructions to deactivate systems (intake and exhaust)
 - ✓ May need to modify procedures to ensure quick deactivation (eg central controls for MVs and AHUs, co-locate controls in one location)



Develop IPP Plan

■ Mechanical Ventilation & AHUs

- ✓ Stop operation of Lifts - piston effect
- ✓ To bypass activation of pressurised systems from auto alarm



Develop IPP Plan

- **Step 3 - Conduct IPP Drills**

Important to familiarise occupants with IPP procedures

Practice Makes Perfect

CERTIFIED



Guidelines

- **Termination of IPP**

- ✓ Occupants may leave the building
- ✓ Use of purging system to dilute and purge the building of any hazardous vapours which may have infiltrated



Conclusion

IPP will offer immediate protection to occupants when evacuation is not advisable during an emergency

Guidelines for IPP at Workplace available on SCDF's Website

[https://www.scdf.gov.sg/home/fire-safety/downloads/acts-codes-regulations/in-place-protection-\(ipp\)-for-non-residential-buildings](https://www.scdf.gov.sg/home/fire-safety/downloads/acts-codes-regulations/in-place-protection-(ipp)-for-non-residential-buildings)



THANK YOU



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