



< Risk identification and safety >

Emergency Escape Routes



IAMC Toolkit

Innovative approaches for the Sound Management of Chemicals
and Chemical Waste



Introduction

In order to ensure safety to chemical industry personnel and minimize harm, the companies plan emergency escape routes in their facilities.

This presentation introduces the reader to the emergency escape route planning, indication and correct maintenance to ensure its use in case of need.

Hazard Management

1. Risk identification and safety

11. Chemical classification and labelling

12. Risk assessment

13. Safety rules

14. Personal protective equipment

15. Skin protection

16. Emergency escape routes

17. Handling of solvents, acids and bases

18. Safety in gas tank handling

2. Transport and storage

21. Internal transport of chemicals

22. Internal pedestrian routes

23. Storage

3. Fire and explosion protection

31. Fire protection

32. Fire protection in welding and cutting operations

33. Explosion protection

34. Container cleaning

4. Emergency response

41. Emergency response plan

Contents

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2. Emergency Escape Routes
 - Good practices
 - Design
 - Organization, training and behaviour
3. Sources

Context

Context

- In industry, **undesirable events** can occur and endanger the lives of those present on site:
 - Incidents
 - Failures
 - Fires
 - Explosions
- **Main dangers** in the event of an emergency:
 - Fire, smoke, gas or water leaks
 - Unusable escape routes
 - Disorientation in the dark



Fire in a chemical company

Source: Londoño G.



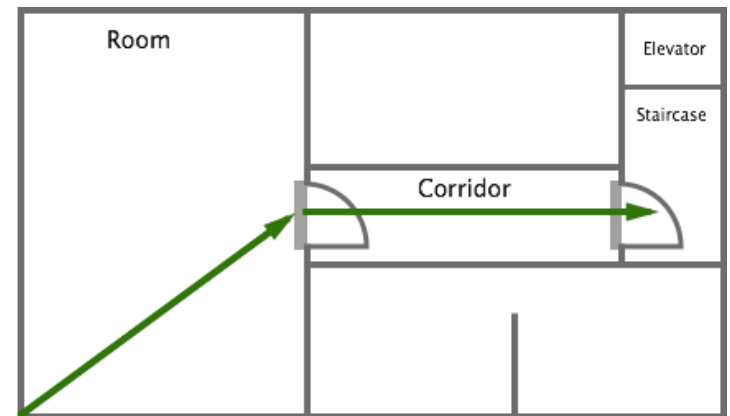
Explosion of propellant powders

Source: Londoño G.

Emergency Escape Routes

What is an Emergency Escape Route?

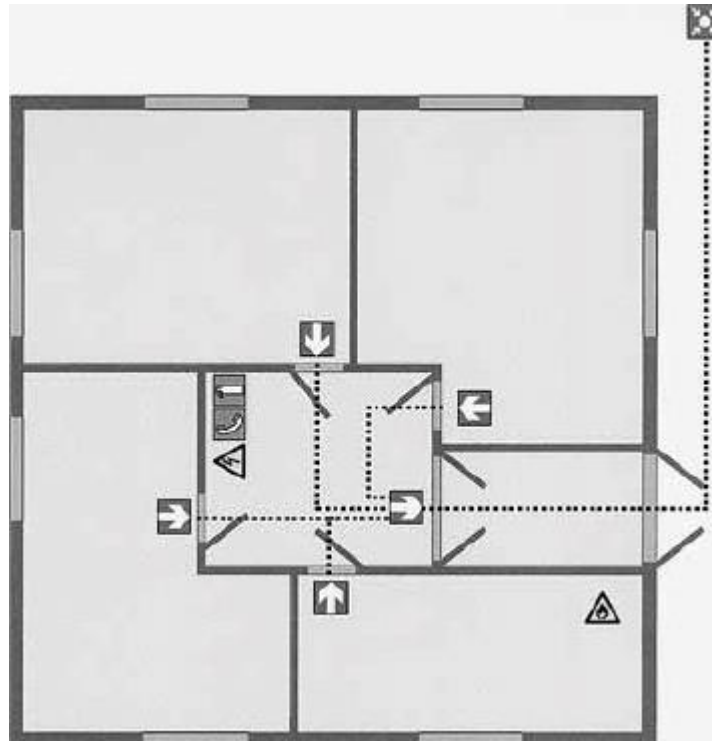
- A path is considered an **emergency escape route** if it is:
 - The shortest path which can be taken to safely leave the plants/buildings from any location and reach an open space.
- A **means of escape** is composed of the following elements:
 - Escape route
 - Premises' exits
 - Corridors
 - Stairways



Source: based on ECAP

Emergency Escape Routes – Good Practices (1)

- **Emergency evacuation plans** have to be displayed at strategic locations and should be visible and understandable.



Source: Suva

Emergency Escape Routes – Good Practices (2)

- The **escape routes are clearly indicated** and equipped with specific signs.
- The **escape routes (corridors, doors, etc.) are free of obstacles.**
- The escape routes can be used **without any risk.**
- The exit doors are keyless and open in the direction of the escape route.



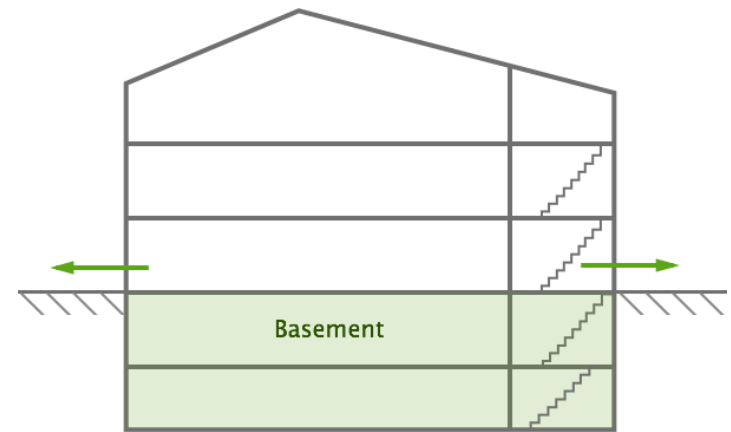
Source : Suva



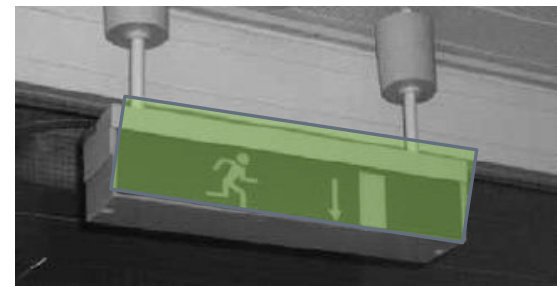
Source: Suva

Emergency Escape Routes – Good Practices (3)

- One is able to **escape from any basements or storeys** in the event of a fire.
- The **lighting of the escape routes** is in good condition.
- In case of a power failure, the **escape routes are always easily recognizable** (e.g. emergency lighting, phosphorescent signs).



Source: based on ECAP

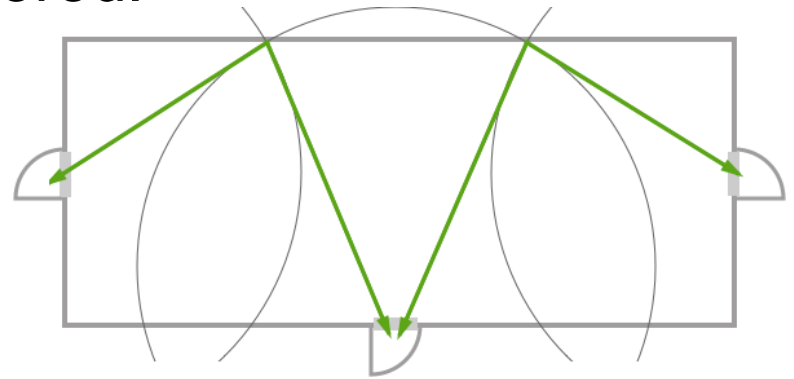


Source: Suva

Design of Emergency Escape Routes

Dimensioning of Emergency Escape Routes

- When dimensioning emergency escape routes, several parameters have to be considered:
 - Number of occupants
 - Number of storeys
 - Type of construction
 - Situation
 - Surface
 - Allocation of the buildings, installations and firebreak compartments

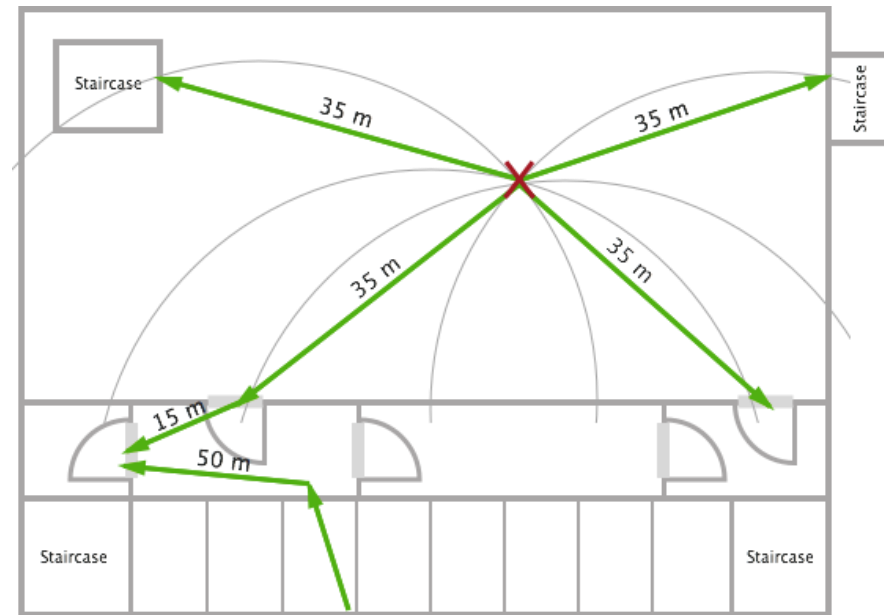


Measuring the shortest distances with an arc

Source: based on ECAP

Dimensioning of Emergency Escape Routes

- If the emergency escape routes give access to:
 - **Only one stairway**, the gross floor area should not be larger than **600 m²**.
 - **Several stairways**, the gross floor area should not be larger than **900 m²**.
- The stairways should be as far as possible from each other to **offer independent escape directions**.



Source: Based on ECAP

Dimensioning of Emergency Escape Routes

- Stairways and staircases:
 - The **minimum width for stairways** should be **1.2 m**.
 - **Staircases** should be **firebreak compartments** (resisting at least a fire of one hour).
- Corridors:
 - The **minimum width for corridors** should be **1.2 m**.
 - Corridors can be firebreak compartments.
- Doors:
 - Doors should open in the direction of the escape route.
 - The exit doors can be opened without external help (e.g. key) and also from the outside (for rescue teams).
 - Each door should have an **average clearance of 0.9 m**.

Design of Emergency Escape Routes

- The design of the escape routes is approved by the competent authority and recorded.
- If the emergency escape routes are to be modified (e.g. transformation of the building), the competent authorities have to be consulted.

Emergency Escape Routes

Organization, Training and Behaviour

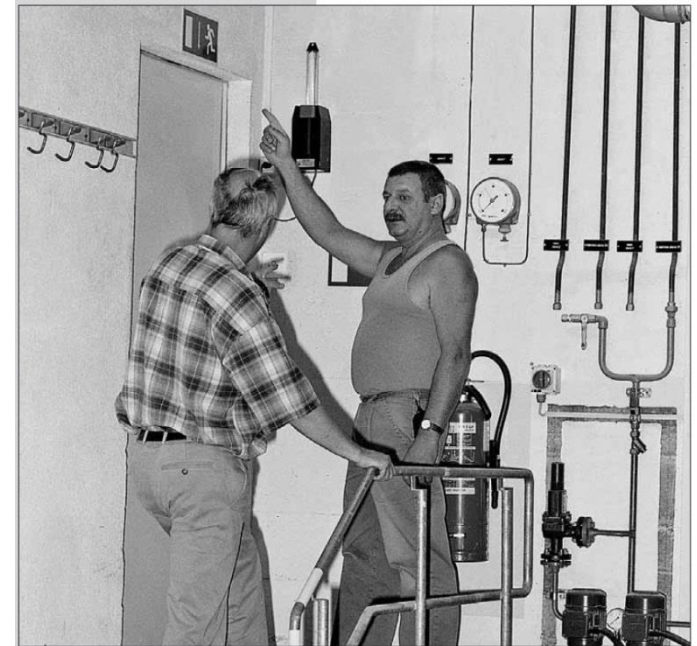
- The use of the **emergency escape routes** is included in the **training programme** of the emergency response plan.
- **Short-term employees and third parties** intervening on site are **informed of the rules** to observe in the event of an **emergency evacuation**.



Source: Suva

Organization, Training and Behaviour

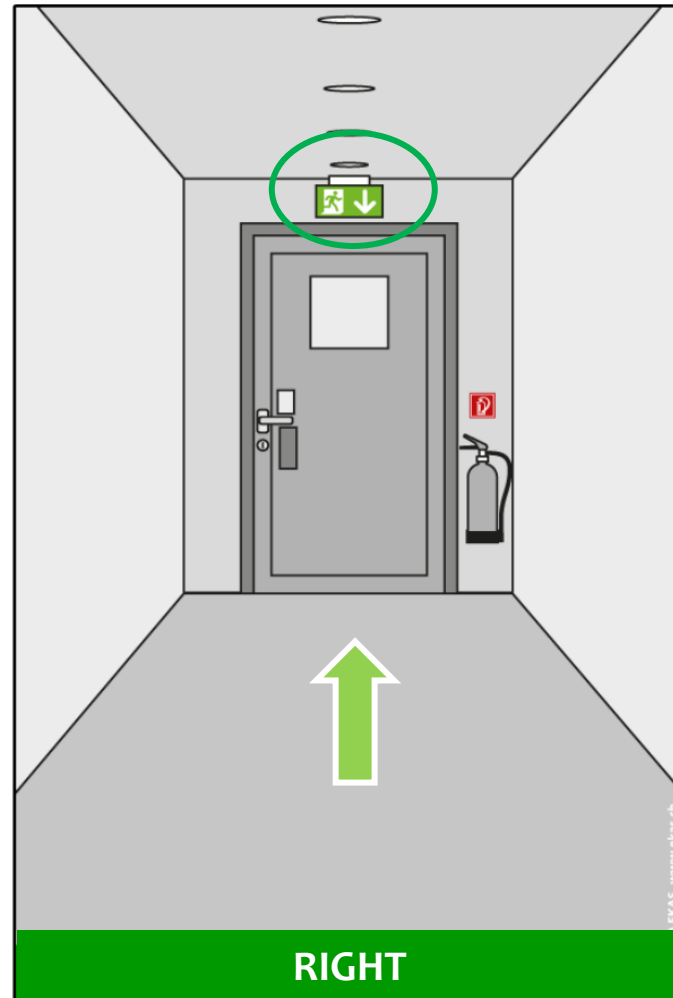
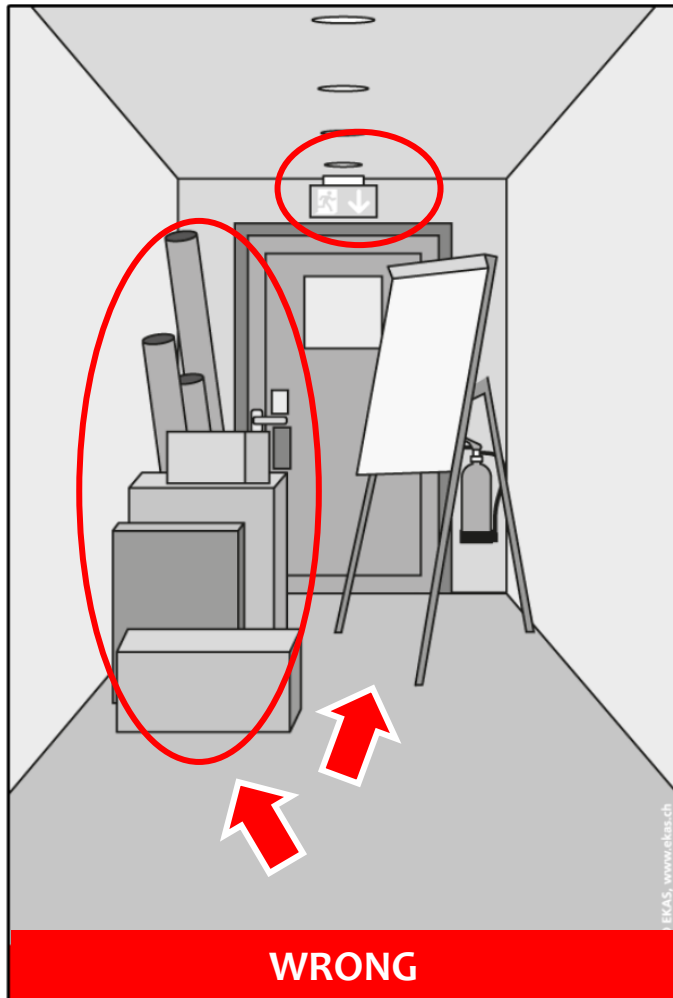
- A designated person **periodically checks the escape routes** and their safety features.
- Superiors monitor **compliance with the rules, correct non-compliance** and **encourage** workforce to ensure safety:
 - Obstacle-free escape routes
 - Access to the exit doors clearly indicated



Source: Suva

What not to do ...

What not to do ...



Source : CFST

Key messages

- A path is considered an emergency escape route if it is the shortest path which can be taken to safely leave the plants/buildings from any location and reach an open space.
- A designated person periodically checks the escape routes and their safety features.
- If the emergency escape routes are to be modified (e.g. transformation of the building), the competent authorities have to be consulted and the workers informed.

Sources

Sources

- CSD Engineers, Switzerland/ISSPPRO, Germany, 2015
- ECAP: Voies d'évacuation et de sauvetage, Switzerland, 2013
- Suva: Liste de contrôle: Voies d'évacuation, Switzerland, 2011
- Suva: Liste de contrôle: Portes et portails, Switzerland, 2010
- Suva: Explosion – Risques et mesures de prévention, Switzerland, 2009

Images

- CSD Engineers, Switzerland, 2015
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- Suva: Liste de contrôle: Voies d'évacuation, Switzerland, 2011
- ECAP: Voies d'évacuation et de sauvetage, Switzerland, 2013
- CFST: Sécurité au travail et protection de la santé, Switzerland, 2012
- Londoño G. for NCPC Colombia

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