



Safety Guard Rail

Safety Operation Guide

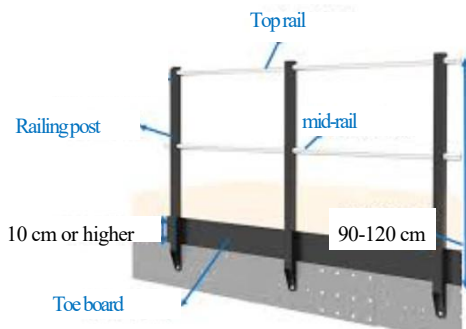
Safety Guard Rail

Definition

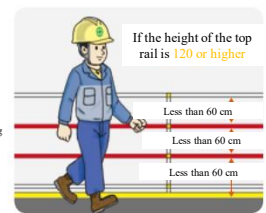
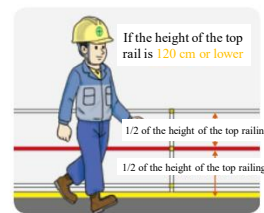
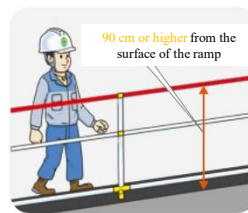
A fall prevention facility installed perpendicular to the floor in areas with a risk of falling, such as the edges of work platforms on ship block edges or hull outer plates

Composition

Top rail, mid-rail, toe board, railing post



The top rail and mid-rail must run parallel to the floor surface along the entire railing.



1 Safety Guard Rail Installation Standards

| | |
|--------------|--|
| Top rail | <ul style="list-style-type: none"> Install the rail 90 cm or higher from the surfaces of the floor, platform, or ramp. |
| Mid-rail | <ul style="list-style-type: none"> If the top rail is installed at 120 cm or lower, install a mid-rail at the midpoint between the top rail and the floor or platform. If the top rail is installed 120 cm or higher, install at least two evenly spaced rails, ensuring that the vertical gap between rails is 60 cm or less. |
| Toe board | <ul style="list-style-type: none"> Maintain a height of 10 cm or higher from the floor or platform. *If there is no risk of falling or flying objects, or if protective nets or equivalent safety measures are in place, a toe board may be omitted. |
| Railing post | <ul style="list-style-type: none"> Maintain an appropriate spacing to support the top rail and mid-rail securely. *Railing posts installed on work platforms of ship blocks are primarily fixed using clamp or bracket mounts. Unlike construction sites, they do not use dedicated hardware (right-angle clamps) but secure the safety guard rail using pins. |

2 Major Hazards

✓ Fall hazards

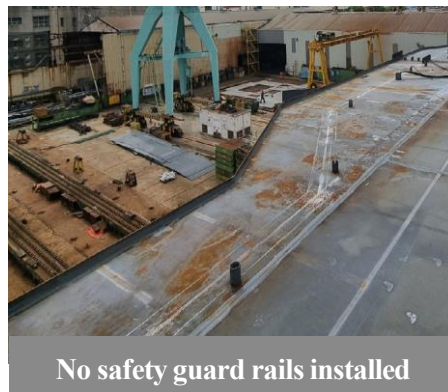
- Risk of falling during the installation or dismantling of work platforms without securing safety harnesses
- Risk of falling while working or inspecting in areas without safety guard rails
- Risk of falling while stepping on the safety guard rail to move to the upper scaffold

✓ Falling/Thrown objects

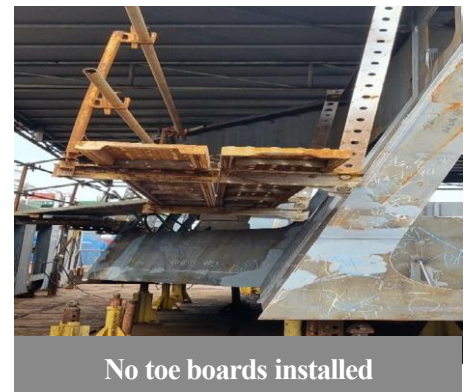
- Risk of tools or materials falling or being thrown from the platform or work surface due to the absence of a toe board



Failure to secure safety harnesses



No safety guard rails installed



No toe boards installed

3 Safety Measures

✓ Fall risk prevention

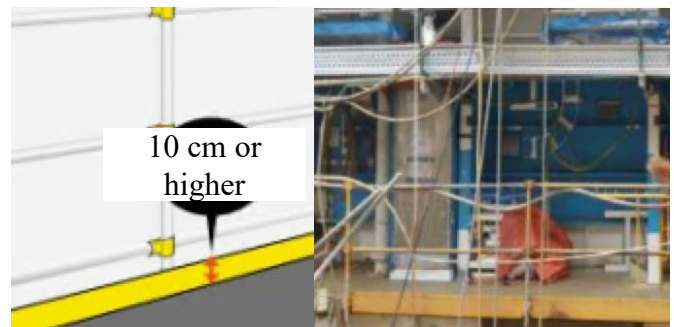
- Secure the safety harness when installing and dismantling the safety guard rail
- Install the top rail and mid-rail at appropriate positions using proper methods

✓ Prevention of falling and flying objects risk

- Install a toe board with a height of 10 cm or higher in areas where there is a risk of falling or flying objects



Safety harness anchoring



Install safety guard rails (guard rails and toe boards)

4 Key Inspections

- Is the safety harness anchor installed in the work area during the installation and dismantling of the safety guard rail?
- Are the components of the safety guard rail appropriately installed according to the standards?
- Is the railing post securely fastened to the structure or scaffold?
- Are the top rail and mid-rail securely fastened to the railing post?
- Do the top rail and mid-rail maintain parallel alignment with the floor or surface?
- Is the toe board securely fastened to the railing post or platform?
- Are there any damages, corrosion, or deformations in the components of the safety guard rail?

5 Risk Assessment (Example)

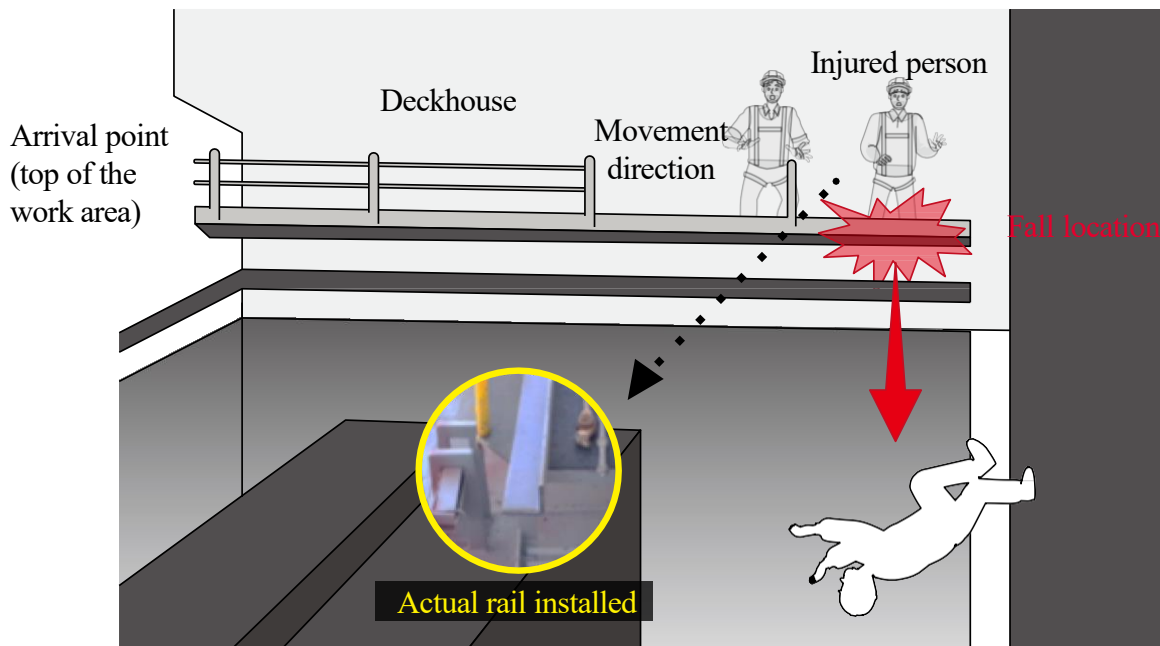
| Hazards | Measures | Regulations on Occupational Safety and Health Standards |
|--|--|---|
| Risk of falling due to the failure to attach the safety harness during the installation and dismantling of the safety guard rail | . Install the safety harness anchor during the installation and dismantling of the safety guard rail, and ensure the worker wears and attaches the safety harness. | Article 42, Article 44 |
| Risk of falling over the safety guard rail when working with the top rail not installed | . Install the top rail at a height of 90 cm or higher from the floor surface. | Article 13 |
| Risk of falling through the open space between the top rail and the floor when working without the mid-rail installed | . If the top rail is installed at a height of 120 cm or lower, install the mid-rail between the top rail and the floor surface. . If the top rail is installed at a height of 120 or higher, install the mid-rail in two or more evenly spaced sections, ensuring the vertical gap between the rails 60 cm or less. | Article 13 |
| Risk of falling materials and tools from the edge of the work platform | . Install the toe board at a height of 10 cm or higher at the edge of the work platform. | Article 13 |
| Risk of collapse when installing the safety guard rail with unapproved materials | . Check the certification before installing the safety guard rail. | - |



Accident Case ① Fall during the replacement of ship cell guide rails

✓ Summary

A worker died after falling about 20 meters to the hold floor while transporting materials for the replacement of the container cell guide rail inside the ship.



✓ Causes

- Failure to install safety guard rails and secure work passage
 - Workers were exposed to fall hazards while working at a height of 20 meters due to the lack of safety guard rails, improper covering of the cargo hold, and the improper placement of materials in the work passage.

✓ Preventive Measures

- Installation of safety guardrails and safe work passages
 - Install safety guardrails in areas with fall hazards (e.g., work areas at heights of 2 m or higher). If safety guardrails cannot be installed, provide workers with safety harnesses and ensure they are properly worn and securely fastened.



Accident Case ② Fall during the installation of safety guard rails on the ship deckhouse

✓ Summary

During the installation of the safety guard rail at the upper edge of the deckhouse, a bundle of safety guard rails toppled, causing a worker who was holding the safety guard rail to fall 17 meters to the floor below, resulting in death.



✓ Causes

- Failure to implement fall protection measures at the top of the deckhouse with fall hazards
- Failure to use safety harness anchors
 - The worker wore a safety harness but did not secure it properly.

✓ Preventive Measures

- Fall protection measures in fall hazard areas
 - Install fall protection measures (e.g., work platforms, safety guard rails, safety harness anchors) in fall hazard areas (e.g., ship blocks).
 - Ensure that workers wear safety harnesses when working in fall hazard areas and securely attach the hook to the safety harness anchor.