

## **ATTACHMENT 3 :**

### **Attendance Sheets Signed by participants**

① 1/7

Safety Management Seminar (2019.08.27-28) Participants Attendance

No	Name	Department	21/12/2011 E.C		22/12/2011		Remark
			Morning	Afternoon	Morning	Afternoon	
1	Mulata Lemma	Lot 2 (Maintenance)					
2	Hailemariam Berete	Lot 1 (Maintenance)					
3	Abeyawork Abebe	JICA					
4	Tengae ASIARE	007297 (HAMAN)					
5	HAILUL GORZE	AACRA (Lot 1)					
6	EMNET TASEW	AACRA (Lot 1)					
7	Amessah Enat	AACRA (Lot 1)					
8	KIDANE BETENE	AACRA WEST ROAD					
9	SAKYHAN LEMMA	AACRA					
10	Frealen Lemma	AACRA					
11	Yibaree Zerihun	AACRA Road Maintenance					
12	Ashenafi Beati	AACKH Road, main					
13	Yihenew Gertnet	AACKA (Lot 1)					
14	Zelalem Teatey	AACKA Maintenance					
15	Mohammed Wabken	AACKA Road, Lot 1					
16	SOLMON JETERA	Lot 1 Project Office					
17	TEWODROS DESSIE	AARA Road and Lot 1					
18	Solemon Tsegay	Lot 2 Structure					
19	Michael Muligeta	Lot 2 Project Office					
20	Addis Birhan	Lot 2 Multilateral					
21	Melaku Munjo	Lot 2 Road Construction					



### Safety Management Seminar (2019.08.27-28) Participants Attendance

No	Name	Department	21/12/2011 E.C		22/12/2011	Remark
			Morning	Afternoon	Morning	
1	Tedric Makkena	OPERATOR	[Signature]	[Signature]	[Signature]	
2	Getahun Assefa	SS	[Signature]	[Signature]	[Signature]	
3	Gelesie Tilahun	OPERATOR	[Signature]	[Signature]	[Signature]	
4	Beke: ERCA	SS	[Signature]	[Signature]	[Signature]	
5	Fieha SEPHAT	OPERATOR	[Signature]	[Signature]	[Signature]	
6	Messia ENDAL	OPERATOR	[Signature]	[Signature]	[Signature]	
7	Mulugeta Yemaneberhan	OPERATOR	[Signature]	[Signature]	[Signature]	
8	Washion yimer	OPERATOR	[Signature]	[Signature]	[Signature]	
9	Zebane Abebu	OPERATOR	[Signature]	[Signature]	[Signature]	
10	Mulugeta Gebre	OPERATOR	[Signature]	[Signature]	[Signature]	
11	Kebede Madhenos	OPERATOR	[Signature]	[Signature]	[Signature]	
12	KIDUS MELAKU	OPERATOR	[Signature]	[Signature]	[Signature]	
13	Eyob Berare	OPERATOR	[Signature]	[Signature]	[Signature]	
14	Moges Derese	OPERATOR	[Signature]	[Signature]	[Signature]	
15	Semere Dessalegn	OPERATOR	[Signature]	[Signature]	[Signature]	
16	Tadafemeal Besa	OPERATOR	[Signature]	[Signature]	[Signature]	
17	Mendot Berkew	OPERATOR	[Signature]	[Signature]	[Signature]	
18	Drak MAMO	OPERATOR	[Signature]	[Signature]	[Signature]	
19	Tesfaye Areyo	OPERATOR	[Signature]	[Signature]	[Signature]	
20	Mulugeta Shidean	OPERATOR	[Signature]	[Signature]	[Signature]	
21			[Signature]	[Signature]	[Signature]	
22			[Signature]	[Signature]	[Signature]	
23			[Signature]	[Signature]	[Signature]	
24			[Signature]	[Signature]	[Signature]	



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### Safety Management Seminar (2019.08.27-28) Participants Attendance

No	Name	Department	21/12/2011 E.C		22/12/2011	Remark
			Morning	Afternoon		
1	Zewdu Ayele	00378 9377	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
2	Ephrem Tadesse	00378 9375	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
3	Ayele Endeshaw	" "	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
4	Emmas Solomon	00378 9377	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
5	Samuel Abera	Quality Assurance	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
6	Isqar Kubabat	00378 9377	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
7	Senira Temal	00378 9377	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
8	Ayele Mihret	00378 9377	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
9	Tonjo Tolba	00378 9375	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
10	Eshetu Deme	00378 9375	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
11	Tadesse Haile	lot one (Road work)	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
12	Emmias Aschale	lot one (mentenense)	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
13	Abdurazak Shifa	Central Road Asset	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
14	Selomon Tordako	00378 9375 d.1.1	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
15	Getnet Tsegaye	Communication	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
16	Habteam Kebede	00378 9375	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
17	Passahon Yitayew	00378 9377 (07-1)	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
18	Maryam Zewdu	00378 9377	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
19	Abraham Amare	00378 9377	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
20	Biniyam Wondimkun	00378 9377	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
21	Mariam Kebede	AAEP-4 HRD	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	



Safety Management Seminar (2019.08.27-28) Participants Attendance

No	Name	Department	21/12/2011 E.C		22/12/2011	Remark
			Morning	Afternoon	Morning	
1	<del>Dora</del> WERKUEL Abri-	Common section				
2	DANTIEL WOKKOK	AMPAZ 3075				
3	GETNET DESAIGNE	PL 68374 ch 2				
4	Merese buhnen	Laboratory				
5	Salomon Birhanic	Road construction lot-1				
6	Belina Jaminu	Operation				
7	Mensar Meversa	Road Asset				
8	Ficadu Kemukhem	Road Asset				
9	Menasu Tifera	Road construction lot 1				
10	Abayna Tufa	Road consolidation				
11	Getachew molla	Road Management Cell				
12	Tessaw Gebena	Management Dept				
13	Nilatu Alemu	Maintenance (wets 2)				
14	Simon Getachew	Maintenance (lot 1) Control				
15	Teshagen Endamu	Road maintenance lot 1				
16	Salomon Alemu	Road maintenance MIT				
17	Agantu Mihilo	Quality Assurance				
18	TASUDEEN KASSAYE SEID	MPIT PCT TELESA				
19	Adenomon Hlaayku	MPIT PCT TELESA				
20	Gosira Tsam	MPIT PCT				
21	Yndoo YAPKOO	MPIT PCT				

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 (J)

### Safety Management Seminar (2019.08.27-28) Participants Attendance

No	Name	Department	21/12/2011 E.C		22/12/2011	Remark
			Morning	Afternoon	Morning	
1	Kassahun Abebe	Tek. Cont.				
2	Mespin ASEFA	Asphalt maintenance				
3	MURIEL ABEYNSU	RS/PS-1				
4	Kaleab GOROMIS	asphalt 10 & 4				
5	Emawys Muligeta	lot 4				
6	Biruk Fitru Aremu	PIMM maintenance Team				
7	Yihenew Getachew Amesse	PAM & RB				
8	Addisu Virgil	BARA lot-2 PM				
9	Johannes Gerem	Gowase				
10	Tekeste Amen	Maintenance lot 2				
11	Girma Shema	Southern PAM				
12	Bilesum Beyecha	Road Maintenance				
13	Emikas Abate	Laboratory				
14	Finna Neseh	Road Maintenance				
15	Ednas Hemed	SR				
16	MilAete Seidseid ATEF	Di Zonta				
17	Halima Tentahun	Road Maintenance				
18	Seid Melwde	Road maintenance				
19	Abiyau Daniel	Road maintenance				
20	Harleguoin Tessema	Road maintenance				
21	Minyishu Beka	lot-1 maintenance				

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 (6)

**Safety Management Seminar (2019.08.27-28) Participants Attendance**

No	Name	Department	21/12/2011 E.C		22/12/2011		Remark
			Morning	Afternoon	Morning	Afternoon	
1	Alexander Sontoyeni	375	Present	Present	Present	Present	
2	Getu Gebre	375	Present	Present	Present	Present	
3	Yared Seyoum	ambisps Batsse	Present	Present	Present	Present	
4	Kirchiel Kabele	375	Present	Present	Present	Present	
5	Teklemariam Bihare	enforcement road constr	Present	Present	Present	Present	
6	Tewodros Tobebe	375	Present	Present	Present	Present	
7	Kabeteabell Chemekel	Directorate maintenance	Present	Present	Present	Present	
8	Mohammed Shomera	Maintenance Lot 2	Present	Present	Present	Present	
9	Herflem Tjalem	South P.Am	Present	Present	Present	Present	
10	Myriam Abera	ambisps Batsse	Present	Present	Present	Present	
11	Mariam Abek	Maintenance Lot 2	Present	Present	Present	Present	
12	Helsamuel Lamma	Road maintenance	Present	Present	Present	Present	
13	Shewansizaw Ghiorghis	ACKA	Present	Present	Present	Present	
14	Abi FREDENIFUS	training center	Present	Present	Present	Present	

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### Safety Management Seminar (2019.08.27-28) Participants Attendance

No	Name	Department	21/12/2011 E.C		22/12/2011	Remark
			Morning	Afternoon	Morning	
1	Simonene Amang	Commission Lot-3				
2	Arment Hosten	00378-375				
3	Behaika Lissali	00322-7375-4				
4	Amos Alkwasena	HR-11				
5	Biruk Aray	00326-375				
6	Debesay Deay	HR (1)				
7	Fuluwager Ziwot	HR				
8	Ul 44-00375	HR-3				
9	003307-0037	9-1059				
10	2119-0001	00378-375-100/1183				
11	00378-375	00378-375-111				
12	9927-0260	00378-375-107-2				
13	00378-375-111	00378-375-111				
14	Samuel Ambaw	00378-375-111				
15	Adenay T/mawot	00378-375-111				
16						
17						



## **ATTACHMENT 4 :**

### **Photos**

**Photo(1/2)**

**【Safety Management Seminar 27<sup>th</sup> August 2019】**



Photo1 : Opening Address by AACRA



Photo2 : Opening Address by JICA Ethiopia Office



Photo3 : Safety Management Seminar①



Photo4 : Safety Management Seminar②



Photo 5 : KY Exercise Group Work



Photo 6 : Presentation of KY Exercise



**Photo (2/2)**

**【Field Study 28<sup>th</sup> August 2019】**



Photo 7 : Meeting before Field Study



Photo 8 : Safety on Excavator Works①



Photo 9 : Safety on Excavator Works②



Photo 10 : Safety on Crane Works①



Photo 11 : Safety on Crane Works②



Photo 12 : Safety on Crane Works③

## **ATTACHMENT 5 :**

### **Power Point for Safety Management Seminar**






**Safety Management Seminar  
Addis Ababa City Road Authority  
Federal Democratic Republic of Ethiopia**


Introduction of  
**The Guidance for Management of  
Safety for Construction Works in  
Japanese ODA Projects**

September 2014  
Japan International Cooperation  
Agency (JICA)

August 2019







Introduction

Principle


「World Human Rights Declaration: Ensuring human safety and respect for basic human rights」

Aims

Establish a safe and health-conscious working environment in ODA Projects.

- Establish “culture of safety” whereby safety is prioritized.
- Establish a mechanism that automatically promotes active implementation of occupational safety measures
- Enhance people’s awareness of safety

※It is not formulated for the purpose of replacing laws or regulations of recipient countries.





## Contents of the



Chapter 1	General Rules
Chapter 2	Basic Policies of Safety Management
Chapter 3	Contents of "Safety Plan"
Chapter 4	Contents of "Method Statement on Safety "
Chapter 5	Technical Guidance for Safety Execution (by the Type of Work)
Chapter 6	Technical Guidance for Safety Execution (by the Type of Accident)



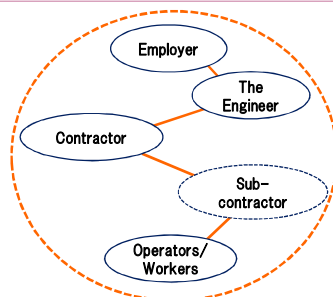
## Chapter 1



### Purpose

**Prevent the occurrence of occupational and public accidents by creating a culture of safety and help social development in the recipient country.**

### Roles and Responsibilities of Project Stakeholders



### Project Stakeholders



## Project Stakeholders Roles and Responsibilities ( 1 )



Project Stakeholders	Roles and Responsibilities
Employer	<ol style="list-style-type: none"> <li>(1) The Employer shall endeavor to strictly comply with the relevant laws and regulations of the recipient country and use the Guidances to ensure the safety of the Project Stakeholders during construction works at site and protect nearby local residents, and any other third parties, from every potential accidental risk foreseen to arise from the construction works at site.</li> <li>(2) The Employer shall, in collaboration with the Engineer, review the Safety Plan and the Method Statements on Safety prepared by the Contractor and provide notice, suggestion or guidance for improvement to the Contractor if there are any risks to safety.</li> <li>(3) The Employer shall, in collaboration with the Engineer, make sure the work is carried out in accordance with the Safety Plan and the Method Statements on Safety prepared by the Contractor and provide notice, suggestion or guidance for improvement.</li> <li>(4) The Employer shall endeavor to create an environment where all Project Stakeholders positively participate in activities to promote safety on construction sites.</li> <li>(5) When two or more Contractors carry out work at the same construction site, the Employer shall establish an environment for mutual cooperation and coordination on safety management.</li> <li>(6) The Employer shall notify the Contractor of natural conditions, social conditions or any other factors that may affect the management of safety for construction works at site.</li> </ol>



## Project Stakeholders Roles and Responsibilities ( 2 )



Stakeholders	Roles and Responsibilities
Engineer	<ol style="list-style-type: none"> <li>(1) The Engineer shall have a full understanding of the roles and responsibilities of the Employer on the management of safety for construction works at site and, together with the Employer, appropriately implement activities to manage safety, including these obligations specified in the contract documents.</li> <li>(2) The Engineer shall, in collaboration with the Employer, review the Safety Plan and the Method Statements on Safety prepared by the Contractor and provide notice, suggestion or guidance for improvement to the Contractor if there are any risks to safety.</li> <li>(3) The Engineer shall, in collaboration with the Employer, make sure the work is carried out as per the Safety Plan and the Method Statements on Safety prepared by the Contractor and provide notice, suggestion or guidance for improvement.</li> </ol>
Contractor	<ol style="list-style-type: none"> <li>(1) The Contractor shall be responsible for operation and management of safety on construction sites.</li> <li>(2) The Contractor shall appropriately prepare the Safety Plan at the appropriate time in the pre-construction stage in accordance with the relevant laws and regulations of the recipient country and these Guidances. In the construction stage, the Contractor shall appropriately prepare the Method Statements on Safety, which shall specify the details of safe methods to implement safety measures prior to the start of each item of work and submit the document to the Employer and Consultant for review.</li> </ol>





## Project Stakeholders Roles and Responsibilities (3)



Stakeholders	Roles and Responsibilities
Contractor	<p>(3) The Contractor shall make appropriate revision or correction whenever any insufficiency or suggestion for improvement relating to safety is raised following the review of the Safety Plan and the Method Statements on Safety.</p> <p>(4) The Contractor shall undertake work according to the Safety Plan and the Method Statements on Safety they prepared. Whenever the Safety Plan or the Method Statements on Safety need to be amended in consideration of the latest site conditions, social and environmental conditions and/or any other relevant particulars. The Contractor shall without delay update and maintain the documents for review at will by the Employer and Engineer.</p> <p>(5) The Contractor shall take into account the safety of nearby local residents and any other parties, as well as all Project Stakeholders of the construction project.</p> <p>(6) The Contractor shall carry out construction works for the safety of nearby local residents and any other third parties, as well as Project Stakeholders of the project.</p>



## Chapter 2 : Basic Policies of Safety Management



### Basic Policies

No	Basic Policies
1	Safety First
2	Elimination of Causes
3	Thorough Precaution
4	Thorough Compliance with relevant laws and regulations
5	Thorough Prevention of Public Accidents
6	Thorough Implementation of PDCA Cycle for Safety Management
7	Thorough Sharing of Information
8	Thorough Participation of all Project Stakeholders



## Chapter 2 : Basic Policies of Safety Management (2)

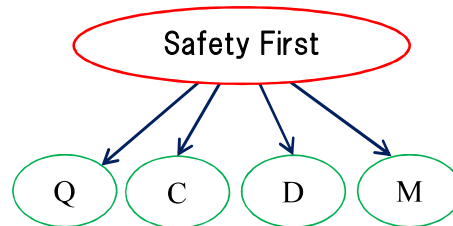


### (1) Safety First

Meaning of "Safety First"

Safety shall be prioritized to Q, C, D and M

Construction Management	
S	Safety
Q	Quality
C	Cost
D	Delivery
M	Morale



In early 1900's, American economy was defeated by recession , and factory workers were forced to work under poor and dangerous condition, as the employer gave the first priority to productivity and profit . However, to the contrary, productivity and profit were not improved due to frequent occurrence of occupational accidents.

Then Mr. Gaily who was the president of US Steel which is one of leading steel manufacturers in the world, decided to improve working conditions to prevent accidents. As the results, as accidents decreased, productivity and profit increased. Mr. Gaily declared " Safety First" for the first time. "Safety First" then prevailed in the world.



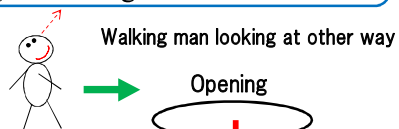
## Chapter 2 : Basic Policies of Safety Management (3)



### (2) Elimination of Causes

### (3) Thorough Precaution

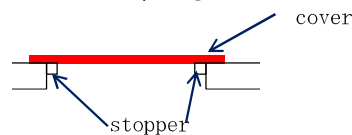
1<sup>st</sup> step : Elimination of Causes



2<sup>nd</sup> step :Precaution(1)

Opening may not be removed, but not used.

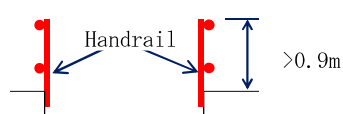
Cover opening



3<sup>rd</sup> step :Precaution (2)

Opening is needed to be open for the works

Install handrail

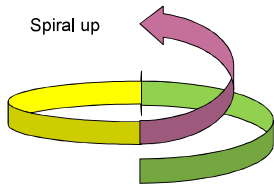




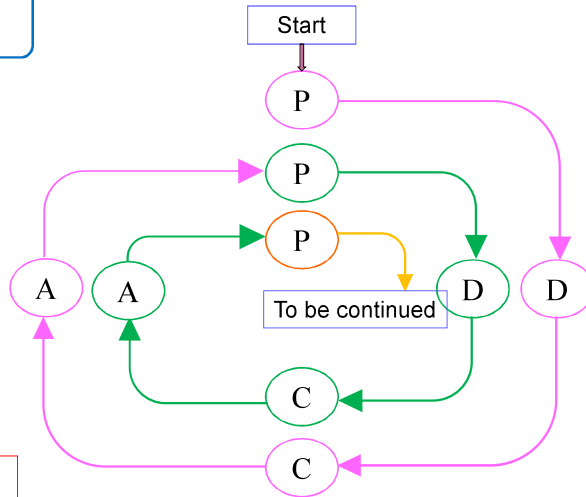
PDCA Cycle for Safety Management

P:Plan  
D:Do  
C:Check  
A:Action

Spiral up



Improve Quality by the implementation of PDCA Cycle



What is “Safety Plan”?

Establish Safety Management System for the Project

Contents of “ Safety Plan”	
(1)	Basic Policy for Safety Management
(2)	Organization for Safety Management
(3)	Promotion of the PDCA Cycle
(4)	Monitoring System
(5)	Safety Education and Training
(6)	Voluntary Safety Management Activities
(7)	Sharing Information
(8)	Response to Emergencies and Unforeseen Circumstances

Chapter 3 : Contents of “ Safety Plan” (2)



(1) Basic Policy for Safety Management

- Basic Policy of the Employer
- Basic Policy of the Contractor
- Basic Policy of the Project

-Example-

**Company’s Basic Policy for Safety Management**

○○Construction Company Annual Safety Basic Policy in 2017

“Elimination of Causes by Thorough KY Activities”

“Eradication of Serious Accident”

**Safety Slogan**

“ Find out and eliminate hidden danger by KY activities”

**Project Basic Policy for Safety Management**

“ Achieve 0 danger by thorough Risk Assessment and KY Activities”

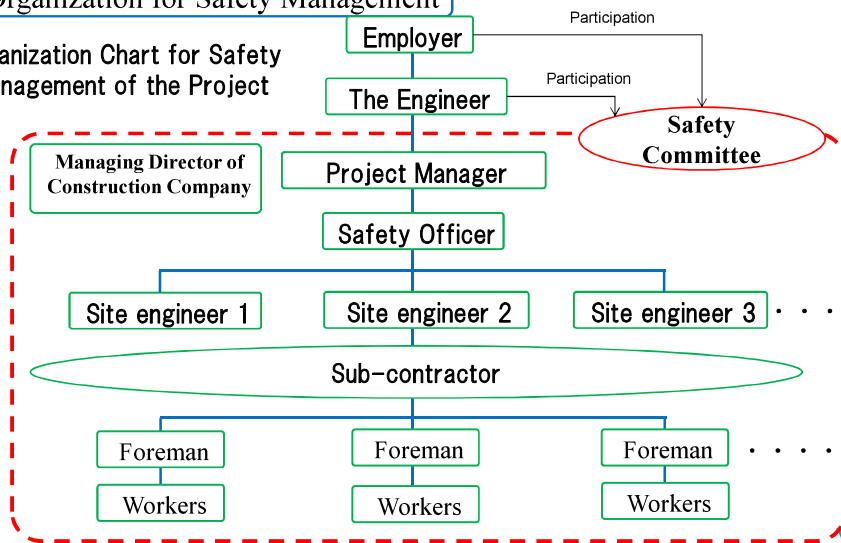


Chapter 3 : Contents of “ Safety Plan” (3)



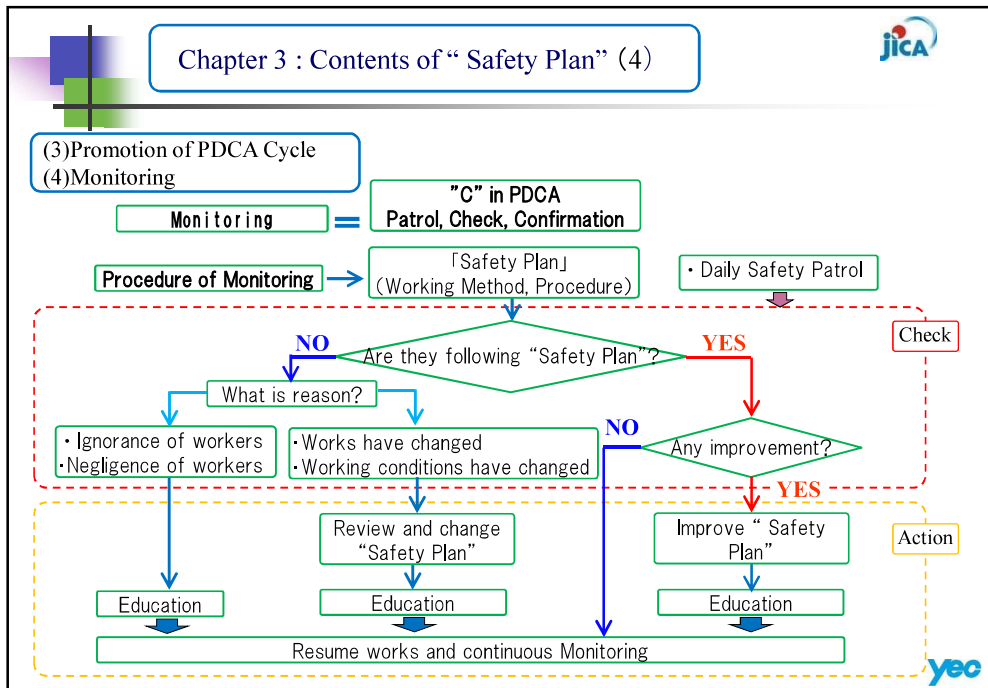
(2) Organization for Safety Management

Organization Chart for Safety Management of the Project





### Chapter 3 : Contents of “ Safety Plan” (4)



### Chapter 3 : Contents of “ Safety Plan” (5)



#### (5) Safety Education and Training

	Safety Education and Training	Contents	Target personnel
1	Education on Safety Laws and Regulation	• Safety Laws and Regulation with respect to the works	Engineer, Foreman
2	New Arrival Education	• All persons who newly arrived at the site shall be educated for the following items • Outline of the project • Rules on site • Daily Safety Construction Cycle, and so on	All personnel
3	Education of Safety Working Procedure	• Safety Working Procedure in accordance with "Safety Plan"	All workers
4	Education of Safety Working Procedure when changed	• Re-education of Safety Working Procedure when it has been changed.	All workers
5	Periodical Safety Education and Training	• Monthly Safety Meeting • Safety Patrol	All personnel



Chapter 3 : Contents of “ Safety Plan” (6)



(6) Voluntary Safety Management Activities

1	Daily Safety Construction Cycle
2	KY Activities
3	5S(3S) Activity
4	Monthly Safety Meeting
5	Safety Slogan
6	Safety Award
7	(Various Safety Activities) <ul style="list-style-type: none"> <li>• Communication Activity</li> <li>• Stone -Paper Activity</li> <li>• Finger Pointing Activity</li> </ul>

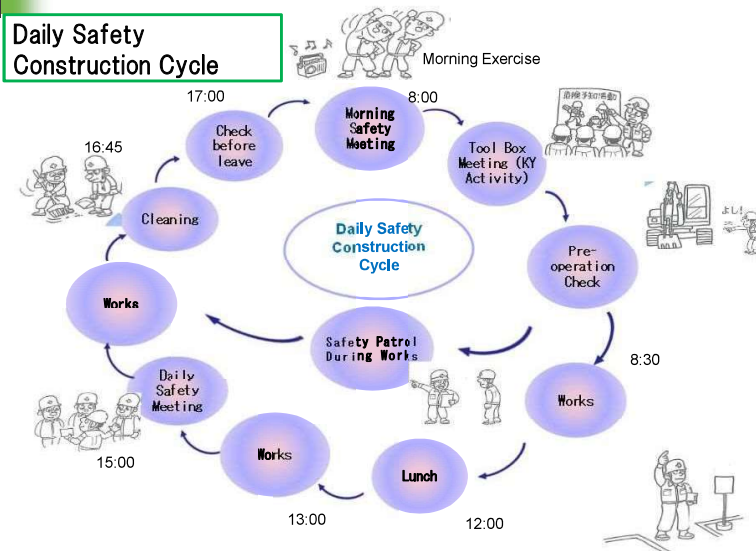
Promotion of Safety Awareness



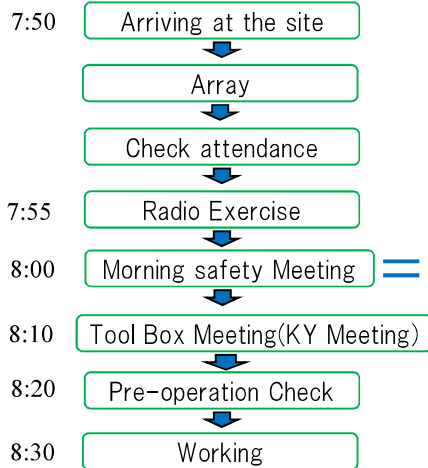
Chapter 3 : Contents of “ Safety Plan” (7)



Daily Safety Construction Cycle



Morning Safety Meeting



- 1 Safety Speech from PM
2. Today's works of each working group
  - Contents of works
  - Safety Instruction
  - Number of workers
3. Sharing Information
4. Chorus of Safety

Morning Safety Meeting

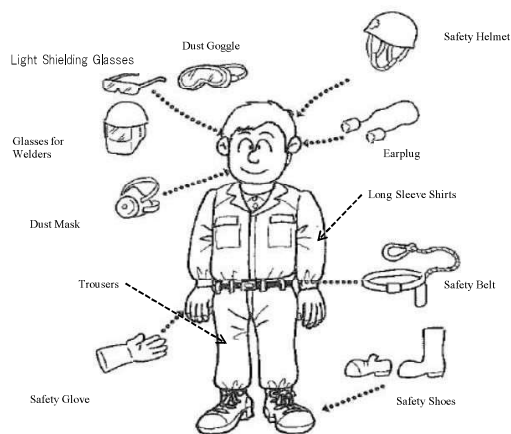




## Morning Safety Meeting



## Wear PPE (Personal Protective Equipment)

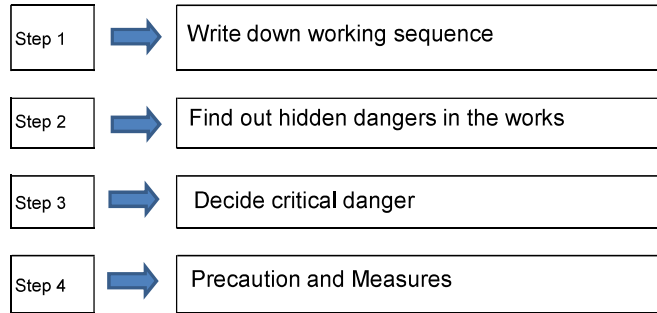


Chapter 3 : Contents of “ Safety Plan” (9)



**KY Activity**

KY= Kiken Yochi (Danger Prediction)



Chapter 3 : Contents of “ Safety Plan” (10)



Sample of KY  
Scaffolding works

**KY Board**

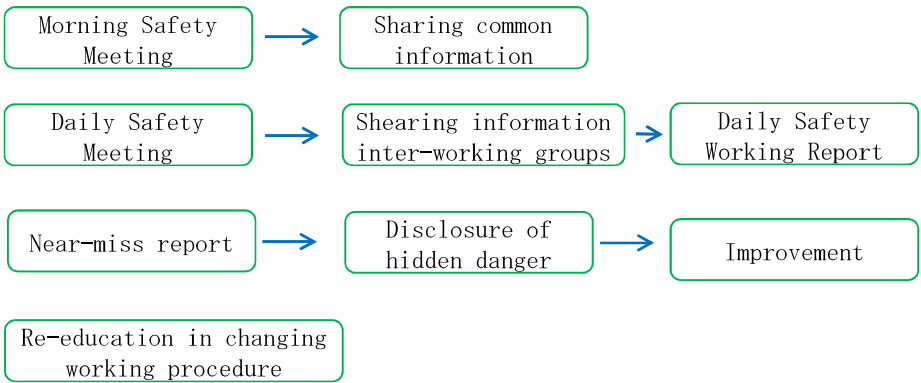
Working Sequence	Danger	Precaution
1 Transportation of Materials	Falling materials hit people	• Confirmations of signs
	Fall from high stage	• Keep out of under materials being transported • Use Safety Belt
2 Erection of scaffolding	Falling materials hit people	• Keep out from working area • Install keep-out barrier
	Fall from high stage	• Use Safety Belt



5S (3S) Activity

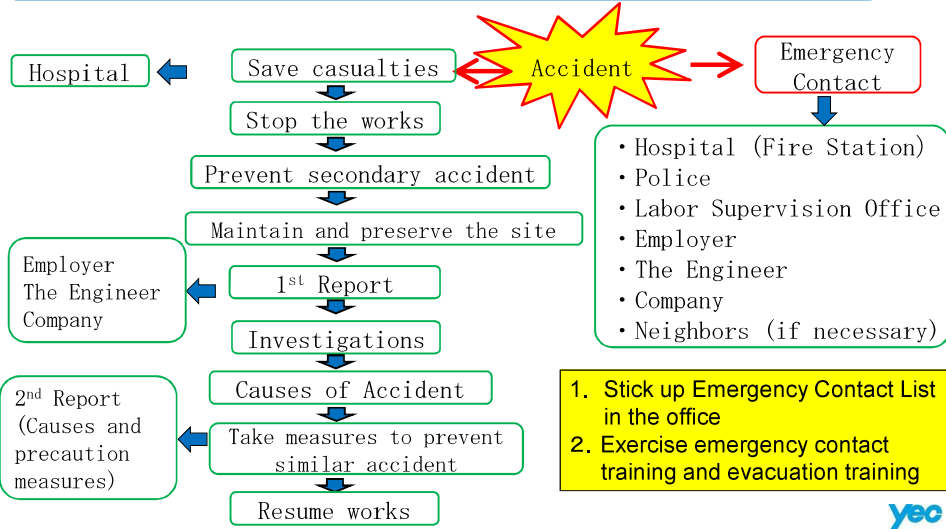
Seiri (Arrangement)	Distinguish necessary materials and equipment and those unnecessary and remove the latter from site
Seiton (Tidy-up)	Place and store materials and equipment in the certain location in tidy manner
Seisou (Cleaning)	Cleaning up the site after work
Seiketsu (Hygiene)	Make site and circumstances hygiene
Shitsuke (Discipline)	Following rules

(7) Sharing Information





(8) Response to Emergencies and Unforeseen Circumstances



“Method Statement on Safety ” :

Based on “Safety Plan”, specific safety plan is prepared taking specialties and construction conditions into account

Contents of “Method Statement on Safety ”	
(1)	Facilities and equipment to be used
(2)	Tools to be used
(3)	Materials to be used
(4)	Necessary qualification
(5)	Organization structure chart
(6)	Works items
(7)	Method and Working Sequence
(8)	Anticipated Risk
(9)	Precautions

Risk Assessment Working Sequence

Chapter 4 : Contents of “Method Statement on Safety ” (2)



Risk Evaluation

Significance / Probability	1 Minor (no absence from work)	2 Serious (absence from work)	3 Very serious (death, permanent handicap)
1 Rare	1 (Very Minor problem)	2 (Minor problem)	3 (Some problem)
2 Middle Possibility	2 (Minor problem)	4 (Serious problem)	6 (Very serious problem)
3 High Possibility	3 (Some problem)	6 (Very serious problem)	9 (Critical problem)

Take precaution measures to Risk exceeding 4



Chapter 4 : Contents of “Method Statement on Safety ” (3)



Risk Assessment Working Sequence (example)

Works: Road Excavation

No	Work Sequence	Risk	Risk Assessment			Measures to be taken	Remarks
			Probability (1)	Significance (2)	Evaluation (3)=(1×2)		
1	Transport Excavator to site	1.1 Excavator fall down from trailer when unloading	1	2	2		
		1.2 Excavator hit worker when moving	1	3	3		
2	Excavation	2.1 Excavator hit worker when turning	3	3	9	Prohibit entering working area Install Barrier	
		2.2 Excavator hit passenger when turning	2	3	6	Allocate Flagman Install Barrier	
		2.3 Excavator hit public vehicle when turning	2	3	6	Allocate Flagman Install Barrier	
		2.4 Excavator falls down into excavated area	1	2	2		
3	Dump Track Move in	3.1 Dump track fall down into excavated area	1	2	2		
		3.2 Dump track hit public traffic	2	3	6	Allocate Flagman	
4	Loading Excavated Material	4.1 Excavator hit worker when turning	3	3	9	Prohibit entering working area Install Barrier	
		4.2 Excavator hit passenger when turning	2	3	6	Allocate Flagman Install Barrier	
		4.3 Excavator hit public vehicle when turning	2	3	6	Allocate Flagman Install Barrier	
5	Dump Track Move out	5.1 Dump track hit public traffic	1	3	3		
		5.2 Material fall down on public road	3	1	3		
6	After Work	6.1 Public vehicle fall into excavated area	3	3	9	Install Barrier with lump	
		6.2 Passenger fall into excavated area	3	3	9	Install Barrier with lump	

Measures should be taken to Risk Evaluation more than 4



### Risk Assessment Working Sequence (example)

Works: Road Excavation

No	Work Sequence	Safety Work Sequence	Who	When	Where	Remarks
1	Transport Excavator to site	1.1 Install Barrier	Worker	Before work	Surrounding working area	
		1.2 Allocate Flagman	Flagman	When transport	At entrance	
		1.3 Trailer move in	Operator			
		1.4 Unloading Excavator	Operator			
2	Excavation	2.1 Install Barrier	Worker	Before work	Surrounding working area	
		2.2 Allocate Flagman	Flagman	During work	At working area	
		2.3 Excavation	Operator			Prohibit entering working area
3	Dump Track Move in	3.1 Allocate Flagman	Flagman	When Move in	At entrance	
		3.2 Dump track Move in	Operator			
4	Loading Excavated Material	4.1 Install Barrier	Worker	Before work	Surrounding working area	
		4.2 Allocate Flagman	Flagman	During work	At working area	
		4.3 Loading Excavated Material	Operator			Prohibit entering working area
5	Dump Track Move out	5.1 Allocate Flagman	Flagman	When Move out	At entrance	
		5.2 Dump track Move out	Operator			
Repeat 3-5						
6	After Work	6.1 Install Barrier with lump	Worker	After work	Surrounding working area	

### § 5-1 Sample Accident (Search the Causes)

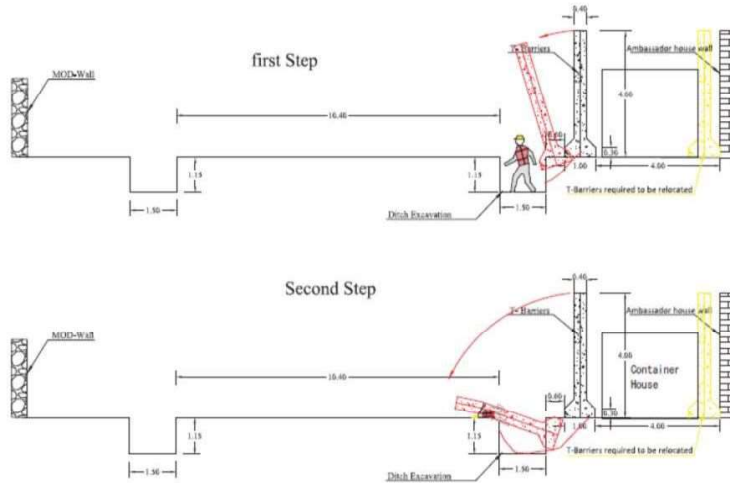




# Sample Accident (Practice)

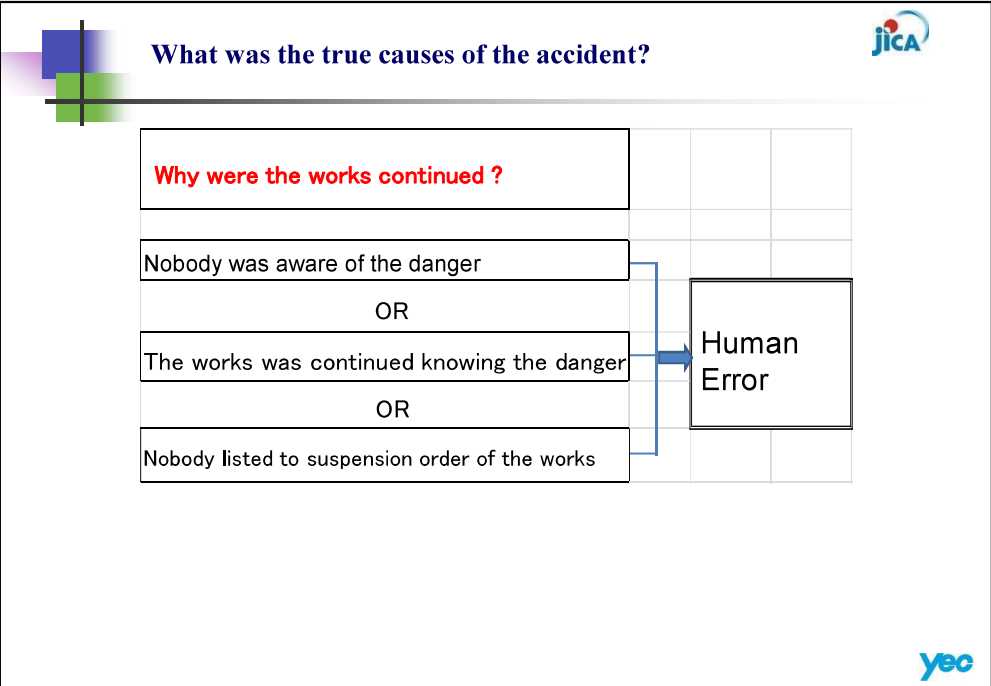
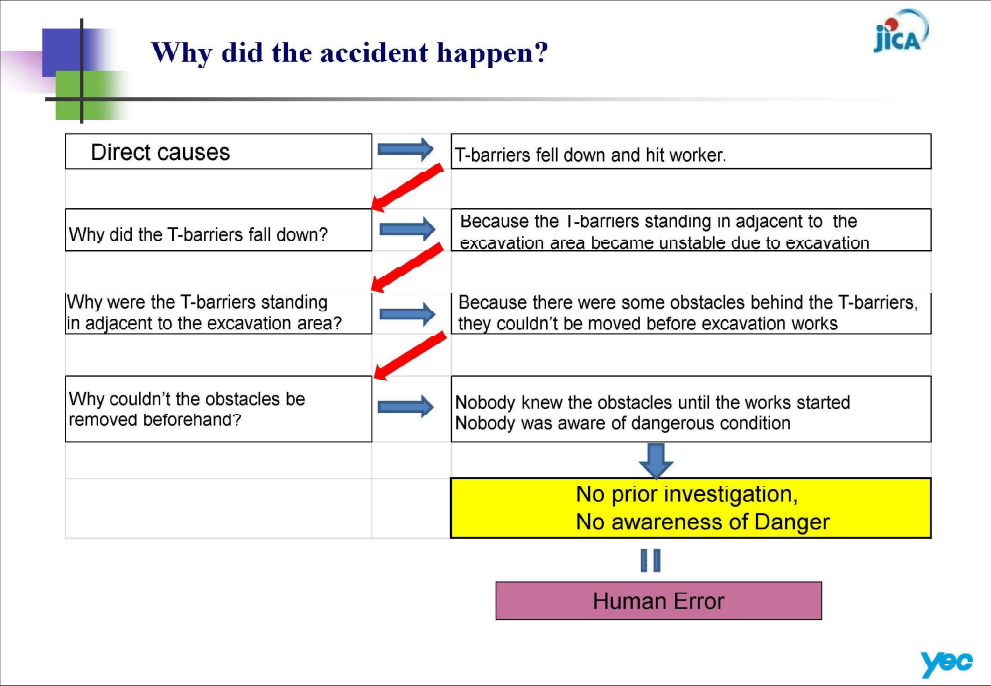


## Occurrence of accident

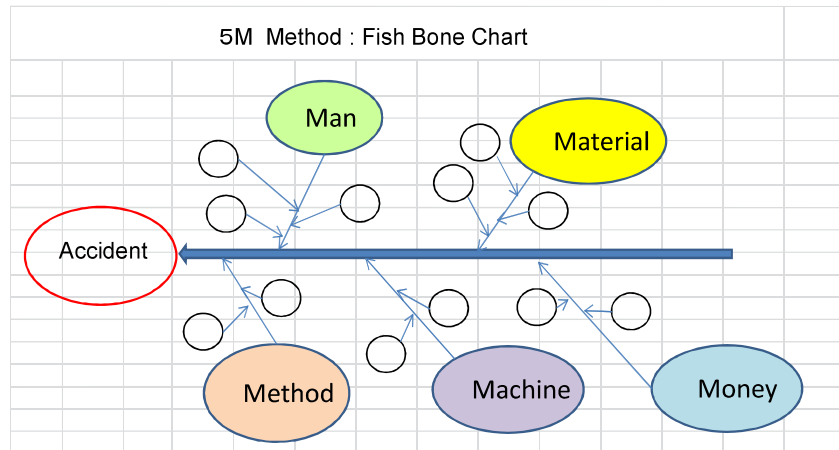


# Suspend the works to prevent further accident





## How to search causes



yec

## Prevention of Human Error



Most accidents were caused by Human Error



No accident could not have been avoided

However,



Human may always make mistakes
• Human forgets
• Human tries to take short cut
• Human wants to think it is OK
• Human wants to think nothing happen to himself
• Human believes blindly



To prevent Human Error

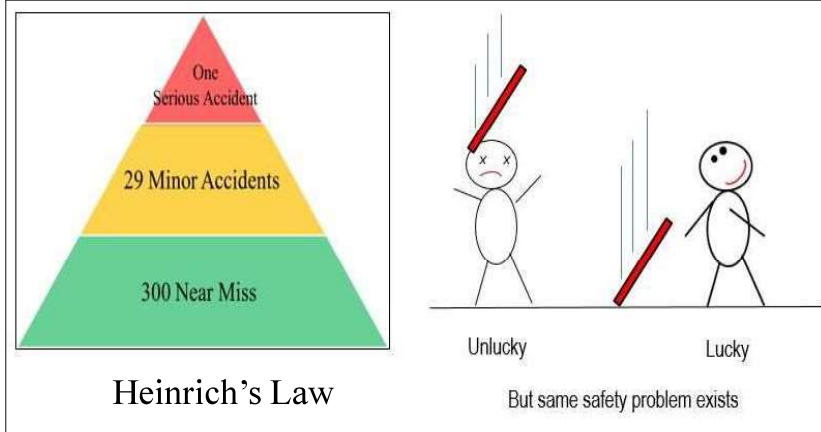
||  
3 C

Check  
Communication  
Confirmation

yec



# Heinrich's Law



## § 5-2 What are hidden dangers?



What are hidden dangers?



What are hidden dangers?



What are hidden dangers?

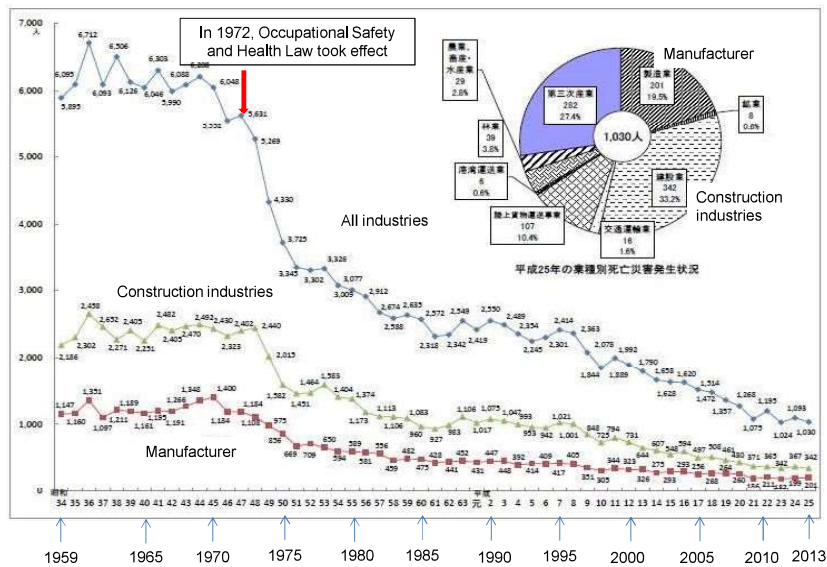


What are hidden dangers?



## § 5-3 Accidents in Japan

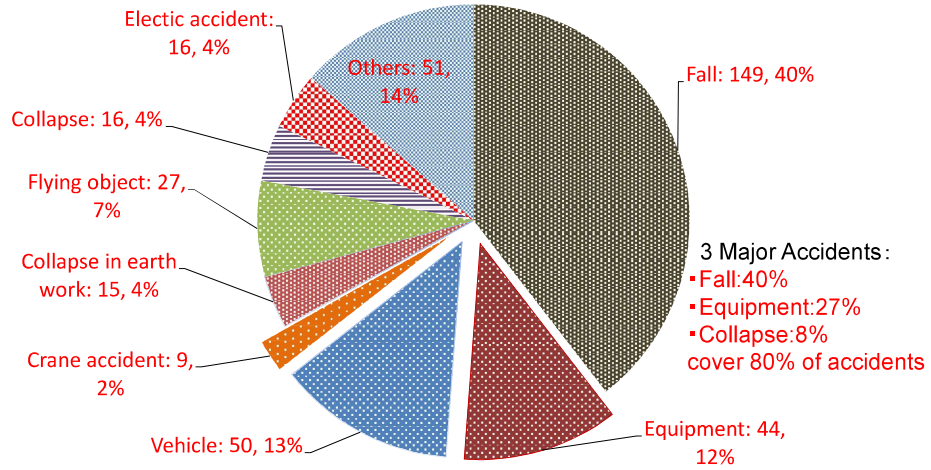
Numbers of Occupational Victims (death) in Japan (All industries)



## Type of Accident in Construction

In 2014

Death :377



### § 5-4 Sample of Heavy Equipment Accidents

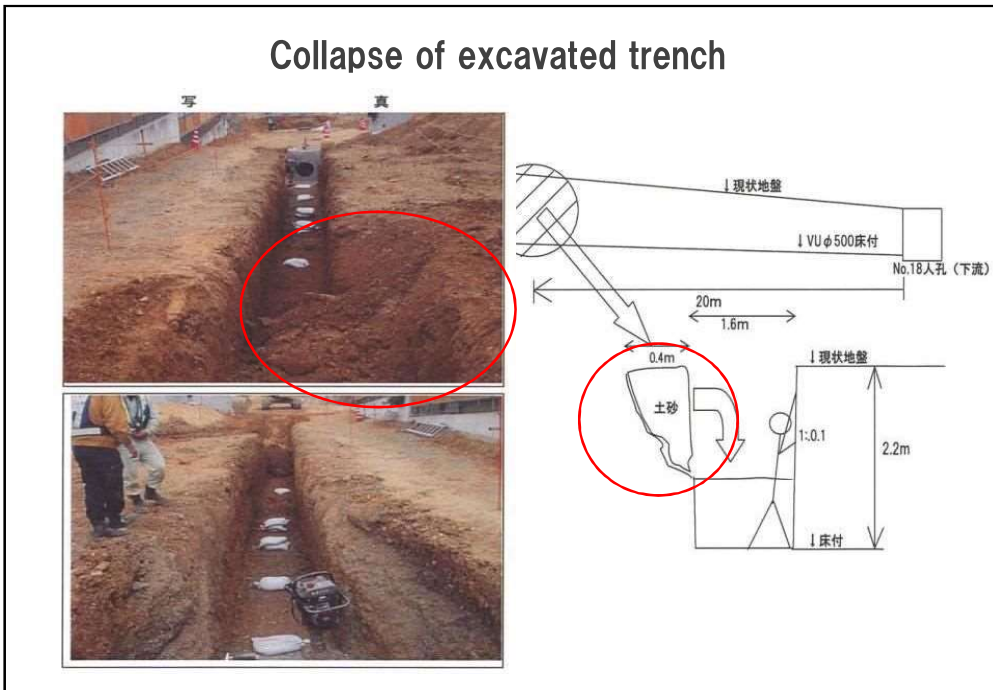


Over-turning due to mistake in operation



Over-turning , fell down into river due to lifting over loading

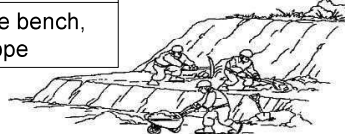
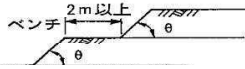




## Standard cutting slope gradient

Standard cutting slope gradient

In case there is more than 2 m wide bench, the standard may apply to each slope



	Type of Soil	Height	Slope degree	
安 衛 則 の 業	Rock or Stiff Cray	5n H<5m	3C <90°	
		5n H>5m	7E <75°	
安 衛 則 の 業	Other Soil	2 H<2m	9C <90°	
		2m<H<5m	1E <75°	
		5 H>5m	5C <60°	

Over-turning of dump truck when moving back



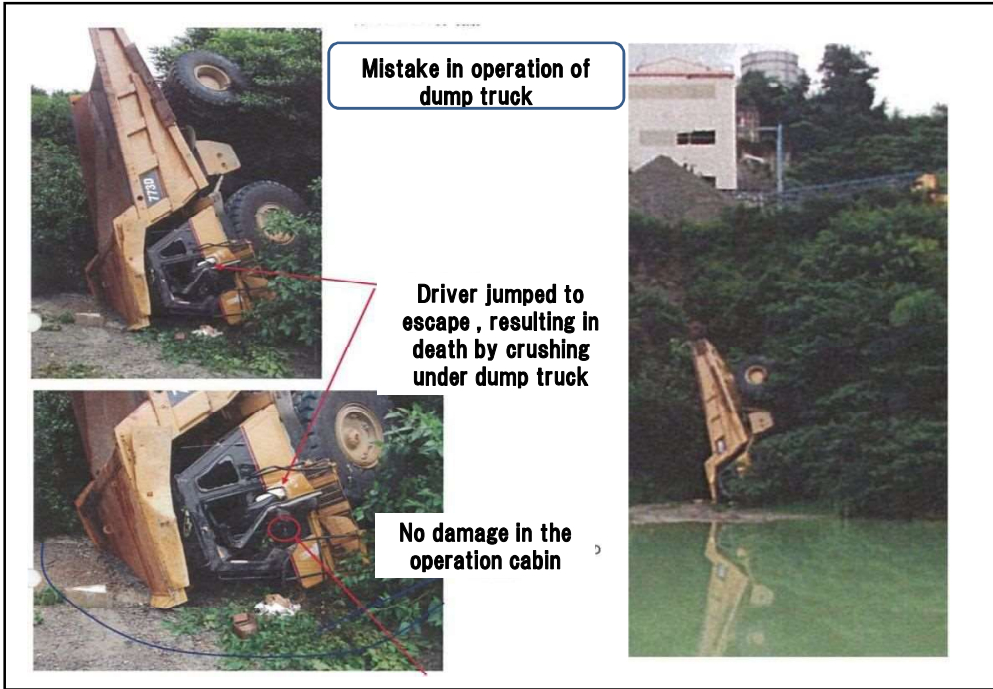


Over-turning when trying to climb up river dam

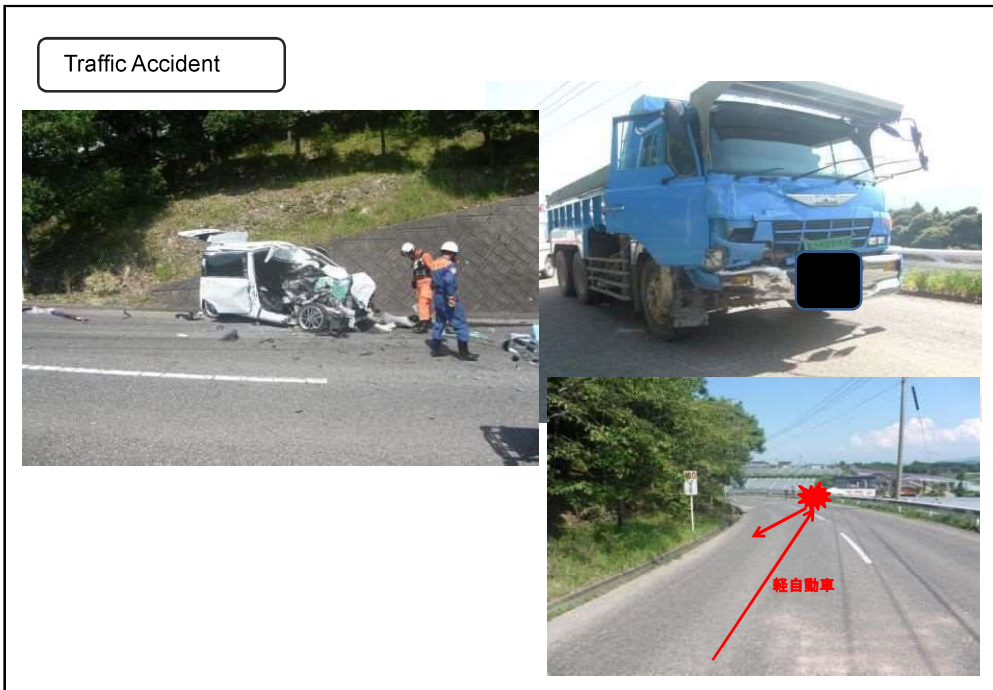


Over-turning due to mistake in operation





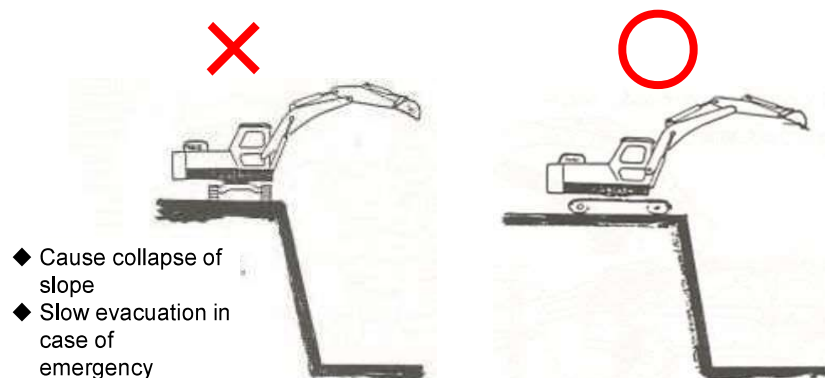




## § 5-5 Prevention of Heavy duty equipment Accidents

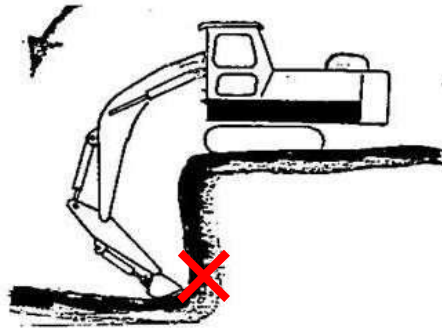
### Basic Operation of Excavator-1

Direction of Caterpillar



## Basic Operation of Excavator-2

Overhung Excavation is prohibited



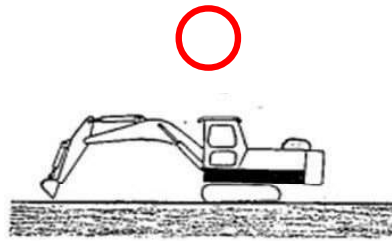
## Basic Operation of Excavator-3

Tale should not be lifted up

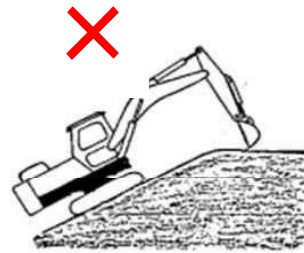


## Basic Operation of Excavator-4

### Parking

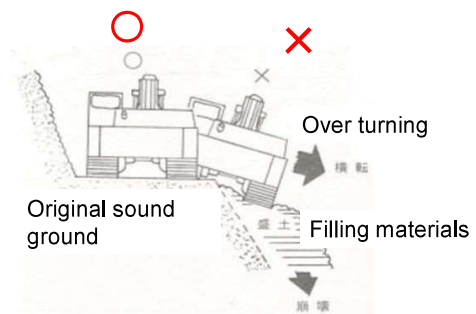
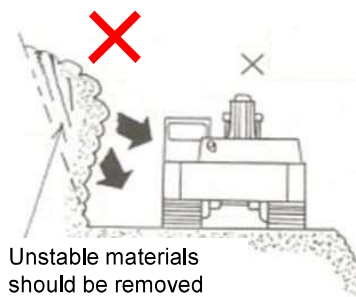


Park on flat ground



Do not park on slope

## Basic Operation of Excavator-5

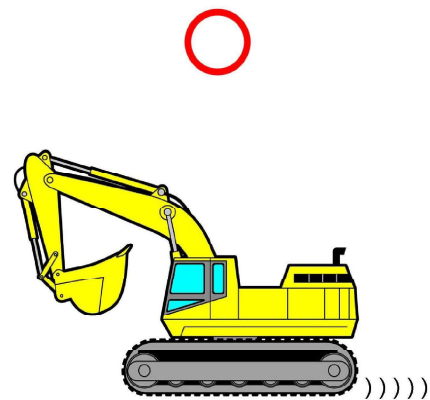


## Basic Operation of Excavator-6

Parking




## Basic Operation of Excavator-7






リスクアセスメント作業手順書(掘削作業)									
安全作業標準手順書 (危険有害要因の特定と軽減対策)									
作業番号	4005	掘削機前視確認し、掘削		定 期 編 制	バックホウ・ブローワー・ポンプ・クレーン等の運転・移動・作業				
作 業 名	掘削機前視確認し、掘削	掘削機前視確認し、掘削		定 期 編 制	バックホウ・ブローワー・ポンプ・クレーン等の運転・移動・作業				
工 種	作業の内容 (一作業区)	掘削機前視確認し、掘削 →土留り作業	掘削機前視確認し、掘削	リスクの発生 頻度	リスクの発生 程度	リスクの発生 範囲	発生要因	対策	備 考
L 掘削機前視確認し、掘削	掘削機前視確認し、掘削	掘削機前視確認し、掘削	掘削機前視確認し、掘削						
	掘削機前視確認し、掘削	掘削機前視確認し、掘削	掘削機前視確認し、掘削						
A 掘削機前視確認し、掘削	掘削機前視確認し、掘削	掘削機前視確認し、掘削	掘削機前視確認し、掘削	4	3	△	土留り作業時、掘削機前視確認し、掘削	掘削機前視確認し、掘削	掘削機前視確認し、掘削
	掘削機前視確認し、掘削	掘削機前視確認し、掘削	掘削機前視確認し、掘削	4	3	△	掘削機前視確認し、掘削	掘削機前視確認し、掘削	掘削機前視確認し、掘削
	掘削機前視確認し、掘削	掘削機前視確認し、掘削	掘削機前視確認し、掘削	4	3	△	掘削機前視確認し、掘削	掘削機前視確認し、掘削	掘削機前視確認し、掘削
	掘削機前視確認し、掘削	掘削機前視確認し、掘削	掘削機前視確認し、掘削	4	3	△	掘削機前視確認し、掘削	掘削機前視確認し、掘削	掘削機前視確認し、掘削
	掘削機前視確認し、掘削	掘削機前視確認し、掘削	掘削機前視確認し、掘削	4	3	△	掘削機前視確認し、掘削	掘削機前視確認し、掘削	掘削機前視確認し、掘削
	掘削機前視確認し、掘削	掘削機前視確認し、掘削	掘削機前視確認し、掘削	4	3	△	掘削機前視確認し、掘削	掘削機前視確認し、掘削	掘削機前視確認し、掘削
	掘削機前視確認し、掘削	掘削機前視確認し、掘削	掘削機前視確認し、掘削	3	2	△	掘削機前視確認し、掘削	掘削機前視確認し、掘削	掘削機前視確認し、掘削
( 続 く )									



Fasten Seat Belt

To prevent falling out of equipment



Compaction roller should move in slow mode

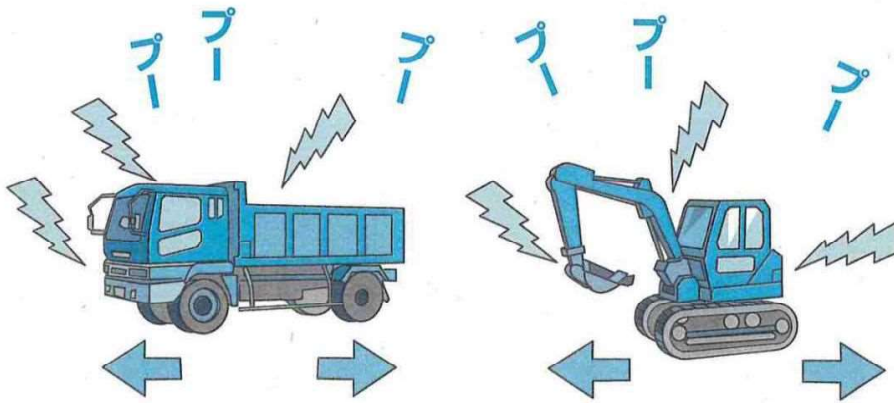
Slow Mode →



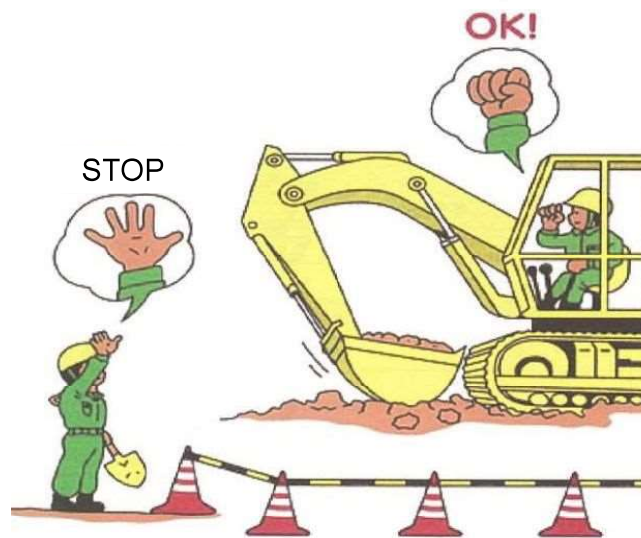
### Sign board at Dump Truck Access Road



## Horn Sign when moving



## Stone Paper Activity



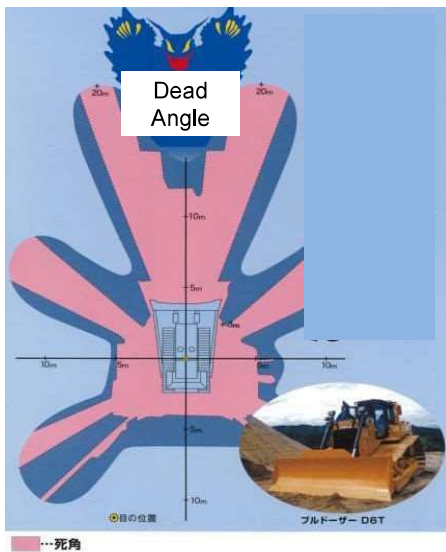
### Precaution Sticker



Moving Back  
KEEP OUT

Operating  
KEEP OUT

### Dead Angle of Equipment











## Fall accident in maintenance work



### Indicate working area of maintenance



### Under maintenance. Don't use



## Safety Hand Rail for Maintenance Works



## Usage of Safety Belt in maintenance work





**Free from materials and goods on the floor**



**Safety Access for workers isolated from construction vehicles**

