

# Safety



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## *Message on Safety*

*The premises of a corporation trusted by community include paying sufficient attention to safety. We are confident that our efforts and initiatives, time and expenses to respect human life should take precedence over all other things. Loss of valuable human life must absolutely be avoided in the process of TOYO's and Toyo Group's business evolution, for example, plant construction.*

*With the recognition that "safety takes precedence over all other things," TOYO will continuously implement safety education programs for all its employees to spread awareness of a culture of safety.*

*"Safety" is an important brand of TOYO. In order to pass down the brand to all the Toyo Group companies in the world, we are strongly promoting safety measures as part of the company-wide safety goal for fiscal 2008: "Make Safety Standard Penetrate Global Toyo."*

*Toyo Group actively strives to consolidate a firm culture of safety.*

## Clients' Commendations for Safety

Our major goal is to hand over superior facilities to our clients through construction work that is completed without any accidents or injuries. For this purpose, Head Office and construction site members, together with the clients and partners, conduct safety management activities in a planned and positive manner, with an established Health, Safety, Security and Environment (HSSE) management system.

In June 2007, TOYO received high commendations from Oita Refinery of Kyushu Oil Co. Ltd., Japan (part of Nippon Oil Corporation since October 2008) for completing the construction without lost time incidents. In January 2008, TOYO achieved a record of 6 million hours without lost time incidents, which was highly appreciated by the client, Yanbu National Petrochemical Company (YANSAB), Saudi Arabia.



Kyushu Oil's letter of appreciation



YANSAB's letter of appreciation

TOYO has received letters of appreciation from the clients listed below, in addition to Kyushu Oil and YANSAB.

### Commendation for safety received recently

Year and month	Reason for commendation	Client	Description
Jul. 2008	No lost time incidents	Indian Oil Co., Ltd	10 million hours operation without lost time incidents at Indian Oil's ethylene project, India
May 2008	No lost time incidents	Dow Corning (Zhangjiagang) Co., Ltd	7 million hours operation without lost time incidents at Dow Corning's silane project, China
Mar. 2008	No lost time incidents	Qatar Shell GTL Limited	3 million hours operation without lost time incidents at Shell's GTL project, Qatar
Mar. 2008	No lost time incidents	Petróleo Brasileiro S.A. (PETROBRAS)	5 million hours operation without lost time incidents at PETROBRAS's refinery modernization project, Brazil
Dec. 2007	Excellent project execution	Ethylene Malaysia Sdn. Bhd. and Polyethylene Malaysia Sdn. Bhd.	Project for Ethylene Malaysia and Polyethylene Malaysia implemented without lost time incidents by Toyo-Malaysia
May 2007	No lost time incidents	Sakhalin Energy Co., Ltd. Royal Dutch Shell	20 million hours operation without lost time incidents at Shell's LNG project, Sakhalin

## Efforts for Safety

### ■ Safety Record

TOYO's safety record for fiscal 2006 through 2008 is as follows.

Both lost time incident rate and total recordable incident rate in fiscal 2008 show a downward trend compared to those in fiscal 2007.

#### Safety record over the past 3 years

Year	Employee Worked (Man-Day)	Employee Hours (A)	Number of Disabling Injured					LTI Rate (Note 1)	Total Recordable Incident Rate (Note 2)
			Fatalities	Lost Time Incident	Medical Treatment (No Lost Time)	LTI Total (B)	Recordable (C)		
2006	8,515,817	86,929,712	3	20	305	23	328	0.26	3.77
2007	9,012,650	89,334,017	1	16	326	17	343	0.19	3.84
*2008	5,501,786	55,360,960	2	8	143	10	153	0.18	2.76

Note 1: Lost time incident (LTI) rate = (B) × 1,000,000 / (A)

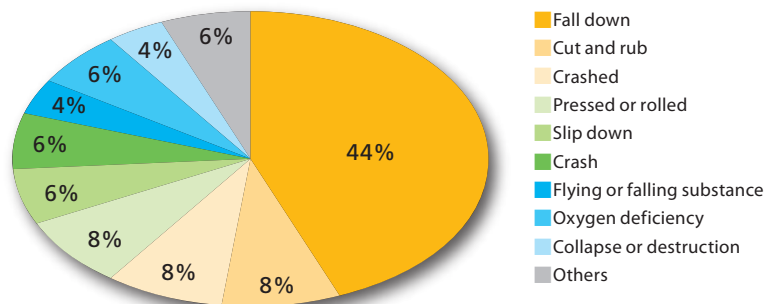
Note 2: Total recordable incident (TRI) rate = (C) × 1,000,000 / (A)

\* Figures for 2008 are up to the end of July.

### ● Number of casualties according to types of incidents

When TOYO's casualties during fiscal 2006–2008 (6 fatalities and 44 injured with lost work time, total 50 people) are divided in incident categories, 44% of the casualties were due to falls. Therefore, the implementation of safety management and preventive measures for elevated work places is essential.

Casualties by categories of incidents (2006–2008\*)



\* Figures for 2008 are up to the end of July.

### ■ Safety in Construction — Ethylene Project in India —

Under the project, TOYO and Toyo-India are jointly constructing a plant unit to produce 800,000 MTA ethylene and related products. The unit is located near Panipat, State of Haryana, about 100 km north of Delhi, the capital of India.

As the construction is now at a peak, more than 3,000 workers are at the site. The client, TOYO, Toyo-India and all the subcontractors are proceeding with the work collaboratively through the implementation of the safety-oriented activities described below, with the slogan: "Safety takes precedence over all other things."

#### Safety-related speeches

Speeches about safety are made at the construction site by workers at their own initiative, which motivates other workers to respect workplace safety.



#### Safety declaration

Poetry about safety, along with a Safety Declaration, is read aloud to raise awareness about safety issues.



#### Safety-related networking

Safety-related networking events are held periodically together with other project teams working nearby to exchange safety-related information among teams.





## ■Safety in Construction — Ethylene Project in Thailand —

A world-class plant unit producing ethylene and related products is being constructed by a corporate team led by TOYO and Toyo-Thai.

The construction at the site located about an hour's drive from Bangkok is now at its peak with more than 4,000 workers at the site. The project is being implemented, under safety-centered and organizational management in line with the construction manager's firmly established safety policy. Unique activities described below are conducted.

### Drug control

Abuse of drugs and alcohol endangers not only the abuser but also everyone in the work area. The management, in cooperation with the local police, prevents illegal drugs and people influenced by drugs from entering the site.



### Health checks

The health of people engaged in risky work such as activities carried out in confined spaces is checked by medical specialists before starting work.



### Local intercommunication

Meetings with local community people are held periodically to reduce anxiety about the construction work. To deepen intercommunication with the community, stationery and other education goods are contributed to local primary schools.



## ■Safety in Construction — PCB Project in Japan —

The project involves the construction of facilities for sorting, disassembling, and disposal of PCB scraps (transformers, condensers, electrical parts that are difficult to dispose of, PCB-contaminated parts, etc.). The construction at the project site, which is about 30 minutes drive from Kokura Station, is now at a peak with more than 120 workers at the site.

Construction safety management is performed through cooperation between the client, TOYO, subcontractors, and related companies. Some aspects of these activities are described below.

### Promotion of comfortable workplace

In order to operate and maintain comfortable workplace management and to enhance awareness of safety, Comfortable Workplace Promotion Plan has been worked out and approved by the Labor Standards Supervision Office.



Plate of establishment approved under Comfortable Workplace Promotion Plan (approved by Fukuoka Labor Department Director)

### Risk management

Risk assessment using KYK Board (Risk Prediction Activity Board) and quality management one-point checks are carried out.



KYK Board

### "Hiyari-Hatto" System

Continually accumulated "hiyari-hatto" (near miss) can be utilized effectively as a tool for construction safety management. The construction site employs a management system using an easy-to-enter touch panel.



"Hiyari-Hatto" System entry training

## ■ Safety standard established in Global Toyo

TOYO has established a global standard for the construction HSSE to enable TOYO and its group companies to perform safety management on the same level in any regions in the world.

This standard specifies that occurrence of incident or major near miss should be reported from the site to TOYO within 12 hours. Received information is immediately transmitted to Toyo Group companies and project sites to prevent similar incidents from occurring.

## ■ Continuous movement toward establishing a culture of safety

### ● In-house safety education

Recognizing that safety is a very basic aspect of corporate activities, TOYO is conducting safety education programs for all the corporate members to spread the culture of safety. This serves as an important motivation to raise employees' awareness of safety.

In order to disseminate a culture of safety and improve sensitivity toward safety issues, education about "Risk Assessment," "Safety Record," "Occupational Health and Safety Management System," etc. is given to particular members.

### ● Safety SHOT campaign

In April 2008, TOYO implemented a "Safety SHOT Campaign" to enhance awareness of safety as a core element of business. At the campaign, leaders of operations units and project managers expressed their determination to materialize "Safety must take precedence."

### ● In-house safety commendation

In fiscal 2007, TOYO improved its safety commendation standard.

Before that time, only large projects that had been completed without lost time incidents were recognized by a president's commendation. From 2007, projects that carried out construction work without lost time incidents in mid-course (each 5 million hours for overseas sites, each 0.5 million hours for domestic sites) are also recognized.

As a result, a total of 12 projects were recognized by the president in fiscal 2007.



●Promoting safety campaign

To establish a culture of safety, a "Safety Campaign" was carried out in June and July 2008.

The safety campaign includes the following major activities:

- (1) Nationwide safety week (president's message and visit to project sites)
- (2) Introducing features of safety management at construction sites in Japan and overseas
- (3) Introducing recent incidents
- (4) Posting campaign posters in the office
- (5) First-aid training
- (6) Reporting on "hiyari-hatto" analysis results
- (7) Easy-to-do health promotion
- (8) Introducing campaigns of Toyo Group companies

It was characteristic of the 2008 safety campaign that Toyo Group companies participated with their own programs worked out individually. The campaign was introduced to the Group companies through the in-house newsletter (domestic) and Global Toyo information magazine (international).

Safety campaigns at TOYO and Toyo Group companies



First-aid training at TOYO



Safety declaration at Toyo-India



Safety workshop at Toyo-Korea



Fire protection workshop at Toyo-China

**THINK SAFE,  
ACT SAFE AND  
BE SAFE AT ALL TIME**

All Toyo-Malaysia members attached this safety slogan sticker to the rear of their cars to boost safety enlightenment activities.



Safety slogan sticker at Toyo-Malaysia

## ●Operating “Hiyari-Hatto” System

“Hiyari-hatto” (near miss) is an incident that was prevented just in time before it occurred. At construction sites, people sometimes experience potentially dangerous “hiyari-hatto.” It is said that repeated “hiyari-hatto” may lead to a serious incident. “Hiyari-hatto” data management system, developed by TOYO, has been employed since Jan. 2008 at some of the domestic construction sites.

“Hiyari-hatto” data at project sites is collected and analyzed at the head office, then fed back to the companies and project sites.

### (1) Summary of “Hiyari-Hatto” System analysis results (indicating the top five items)

Items	Order	No. 1		No. 2		No. 3		No. 4		No. 5	
			(%)		(%)		(%)		(%)		(%)
* When		In the morning	52.2	In the afternoon	36.9	Early in the morning	7.5	Before noon	2.1	Early in the afternoon	0.6
Work		Piping work	11.9	Civil engineering and architecture	11.7	Transportation	9.7	Building equipment	9.2	Scaffolding assembly or disassembly	6.0
* Cause	Material	Fly or drop	59.6	Mudslide	8.6	Fire	7.4	Leakage	3.1	Explosion or rupture	1.2
	Person	Stumble or fall	33.0	Tumble or fall down	17.1	Collision	16.7	Nipped or caught	12.0	Traffic accident	4.6
Foreseeable damage		Bruise or sprain	39.1	Scar or rub	25.5	Bone fracture	22.8	Burn	3.7	Impaled	1.2
Why was the incident occurring?	Person	Confirmation not made	22.5	Inability to respond	8.2	In a hurry	8.1	Rule not followed	6.4	Insufficient knowledge or understanding	5.7
	Work	KYK not implemented	26.6	Work by one person	24.0	Insufficient survey	9.0	Error in planning	7.5	Improper instruction	3.5
										TBM not implemented	3.5
Material	Improper curing	23.0	Improper scaffolding	17.3	Personal protective equipment or tool insufficient or not used	14.1	Insufficiency in safety equipment	13.0	Insufficient indication	8.0	

### (2) Analysis of the (\*)-marked data

#### ●Time of occurrence of “hiyari-hatto”

##### ①Outcome

●“Hiyari-hatto” incidents occurred frequently in the morning (52.2%). More than 50% of the incidents (lost time incidents plus fatalities) in our projects in 2006–2008 occurred in the morning. This trend is observed with “hiyari-hatto” incidents as well. Incidents and “hiyari-hatto” tend to occur in the morning when workers are not well accustomed to the work environment or are not physically and mentally prepared for the work.

##### ②Preventive measures

- Confirm work procedure and safety at morning meeting, KYK (note 1), and TBM (note 2).
- Let all workers see round the work places to identify the conditions before work.
- Make work planning with some margin for time in the morning.

#### ●Causes of “hiyari-hatto”

##### ①Outcome

- Concerning materials, fly and drop occur most frequently.
- Concerning people, stumble and fall occur, followed by fall down and tumble down.

##### ②Preventive measures

- For safety management in general, be sure to build scaffolding, remove unnecessary materials, make curing, implement KYK, and carry out education.
- Concerning workers’ behavior, act carefully, make reconfirmation, and be careful even with familiar work.

These measures are taken at each project site as all-hands safety activity.

(Note 1) KYK stands for “Kiken Yochi Katsudou” (risk prediction activity), or activities for predicting work-related risks before the work is started.

(Note 2) TBM stands for “Tool Box Meeting,” or activity to briefly discuss the contents, methods, arrangements, and problems of the work of the day before starting the work at the workplace.



## Lessons Learned from Serious Accidents

### ■ Fall down accident

#### Situation

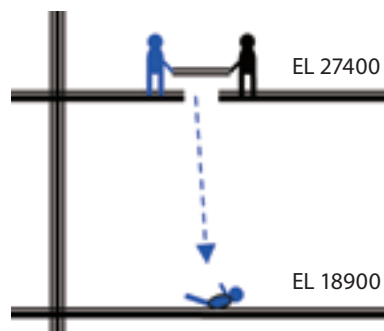
While a steel-frame floor (at 27.4 m height) was cleared, two workers lifted and carried a steel plate that covered an opening for letting a pipe pass through. One of the two workers fell from the opening to the lower floor (18.9 m height) and was injured. The two workers did not know that the steel plate had been installed for covering the opening and did not even identify the existence of the opening.

#### Causes

- (1) The work leader did not provide an explanation or instruction about the following:
  - There was an uncovered opening on the floor.
  - A floor plate was used to cover the opening.
  - The floor plate for guarding the opening must not be removed.
- (2) The method of covering and indication of the opening were not appropriate.

#### Measures

- (1) To be carried out at the project site
  - Attention at pre-work meeting
  - Indication of openings in the whole work area and periodic check of curing state
  - Safety re-education about curing of openings to all subcontractors
- (2) To be carried out by the head office
  - Revise the procedure for covering openings to prevent fall down and familiarize all the sites with the revised procedure.
  - Confirm the observance of procedure with all project sites.
  - Designate opening fall-down protection as priority check points at safety audit.



### ■ Tumble down accident

#### Situation

Prefabricated piping materials were reloaded at a material yard from two pickup trucks to a truck, using a forklift. When a worker was working on a pickup truck, a pipe (size 10 inches × 3 meters, approx. 170 kg) began to tip. As the worker held the pipe to keep it from falling, he fell under the pipe.

#### Causes

- (1) The pipe was reloaded by one person.
- (2) The prefabricated piping material, which was unstable, was reloaded with a forklift, which was not suitable for the work.
- (3) The forklift was operated by an unqualified person.
- (4) The forklift key was controlled in an improper manner to prevent unqualified people from operating the forklift.

#### Measures

- (1) To be carried out at the project site
  - Re-educate all workers about safety issues.
  - Strengthen the management structure of the project site.
  - Strictly follow the prohibition of one-person reloading.
  - Specify cranes suitable for the load shape.
  - Recheck qualified persons and their qualifications.
  - Intensify the control of the keys for construction machines.
- (2) To be carried out by the head office
  - Specify in the safety management procedure the transportation methods for prefabricated piping materials using a forklift and a crane.
  - Assign full-time safety staffs in business units to intensify safety patrols at construction sites.

