

**SAFETY REVIEW REPORT OF  
ON-GOING ODA LOAN PROJECT  
IN THE INDEPENDENT  
STATE OF PAPUA NEW GUINEA**

**March 2017**

**JAPAN INTERNATIONAL COOPERATION AGENCY  
(JICA)**

**IPM SERVICES CO., LTD.  
KATAHIRA & ENGINEERS INTERNATIONAL**

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## Table of Contents

Chapter 1 Outline of Study.....	1-1
1.1 Background and Objective .....	1-1
1.2 Details of the Project .....	1-2
1.3 Study Team Members.....	1-4
1.4 Study Schedule .....	1-4
1.5 Interviewees.....	1-5
1.5.1 Project Related Organization and Persons .....	1-5
1.5.2 Safety Related Organization and Persons .....	1-5
Chapter 2 Current Construction Safety Situation in Papua New Guinea .....	2-1
2.1 Outlook of the Economy .....	2-1
2.2 The Prospect of the Construction Industry .....	2-3
2.3 Legislative System.....	2-3
2.4 Outline of Key Laws and Regulations.....	2-4
2.4.1 Industrial Safety, Health and Welfare Act 1961 (ISHW Act).....	2-4
2.4.2 Industrial Safety, Health and Welfare Regulation 1965.....	2-6
2.4.3 Industrial Safety Orders .....	2-6
2.5 Construction Safety Control Structure .....	2-7
2.5.1 Relevant Agencies' Responsibility .....	2-7
2.5.2 Contractor's Responsibility.....	2-8
2.6 Registration of Qualifications, Etc. ....	2-8
2.6.1 Trade Licence.....	2-8
2.6.2 Operators for Cranes and Other Construction Machinery.....	2-9
2.6.3 Registration of Cranes and Other Construction Machinery .....	2-9
2.6.4 Qualification of Safety Officer.....	2-9
Chapter 3 Safety Review on Site.....	3-1
3.1 Project Outline.....	3-1
3.2 Project Organisation .....	3-3
3.3 Contract for Consultant's Services .....	3-3
3.4 Construction Contract.....	3-4
3.4.1 Conditions of Contract .....	3-4
3.4.2 Specification and BOQ.....	3-7
3.4.3 Health and Safety Management Plan .....	3-8
3.5 Safety Review on Site .....	3-10
3.5.1 Current Progress.....	3-10
3.5.2 Safety Management Activities Etc.....	3-13

3.6	Safety Statistics .....	3-19
Chapter 4	Observation During the Safety Review on Site .....	4-1
4.1	Education and Training .....	4-1
4.2	Report of Accidents/Incidents .....	4-1
4.3	Accident Cause Analysis .....	4-2
4.4	Risk Assessment.....	4-3
4.5	Prevention of Public/Traffic Accidents .....	4-4
Chapter 5	Safety Seminar.....	5-1
5.1	Attendance.....	5-1
5.2	Contents of Seminar .....	5-1
5.2.1	Section 1: History of Accident-prevention in the Construction Industry in Japan.....	5-2
5.2.2	Section 2: Introduction of JICA Safety Policy, Guidance and a Comparison of Safety Plan and that in JICA Guidance .....	5-3
5.2.3	Section 3: Outline of Study Results .....	5-4
5.2.4	Q & A in the Seminar.....	5-5
Chapter 6	Recommendations.....	6-1
6.1	Recommendations to KCH/NJS/DH-JV .....	6-1
6.1.1	Establishment of a Near miss-collection System to Prevent Accidents .....	6-1
6.2	Recommendation to the Contractor(DH-JV).....	6-1
6.2.1	Amendments to the Health and Safety Management Plan (Safety Plan) .....	6-1
<b>Appendices</b>		
Appendix-1	Safety Policy for Construction Works in Japanese ODA Projects.....	App-1
Appendix-2	Hearing Memo.....	App-3
Appendix-3	Site Organization Chart .....	App-5
Appendix-4	Seminar Slides.....	App-8

# Chapter 1 Outline of Study

## 1.1 Background and Objective

JICA has been carrying out approx. 350 numbers of ODA projects annually which include construction of Facilities and approx. 30 persons have lost their valuable lives by occupational accidents during construction. JICA made public on the web site, “Safety Policy for Construction Works in Japanese ODA Projects” dated on 30 March 2015 signed by former President of JICA (hereinafter referred to as “JICA Safety Policy”<sup>1</sup>), in which the following policy is stated.

- *The highest priority must be placed on ensuring safety and protecting human life in construction works of Japanese ODA projects.*
- *JICA is determined to improve prevention measures and reduce occupational accidents, with the aim of eventually eradicating all preventable accidents.*
- *JICA recognizes its role in disseminating "the Japanese culture of safety" to all organizations and individuals engaged in Japanese ODA construction projects.*

Safety Review Study of On-going ODA Loan Project in the Independent State of Papua New Guinea (hereinafter referred to as the “Study”) is regarded as a part of activities which JICA carries out to promote the full implementation of safety measures through site visits by JICA experts and missions.

Based on the recommendation made by the committee deployed by Ministry of Foreign Affairs of Japan, to discuss the measures to prevent recurrence of the similar Accident to that of Can Tho Bridge (Cuu Long) in Vietnam in September 2007, JICA initiated to carry out Safety Review, by a third-party consultant, of Special ODA Loan projects or Special Term for Economic Partnership (STEP) projects which include large scale and technically complex civil works. Thirteen projects were reviewed up to 2015, which are situated in Indonesia, Vietnam, Turkey, Uzbekistan, Philippine, Malaysia, Sri Lanka, India and Kenya.

The objective of the Study is, through carrying out activities item (1) to (4), to contribute prevention or mitigation of occupational accidents during construction of Japanese ODA Loan projects including third -party/public accidents by drawing more attentions of relevant stakeholders to safety measures.

(1) Port Moresby Sewerage System Upgrading Project detailed in Sub-Clause 1.2 (hereinafter referred to as the “Project”) was studied.

(2) To collect the latest information on the laws, standards, etc. of the recipient countries

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<sup>1</sup> A copy of JICA Safety Policy is attached in Appendix-1.

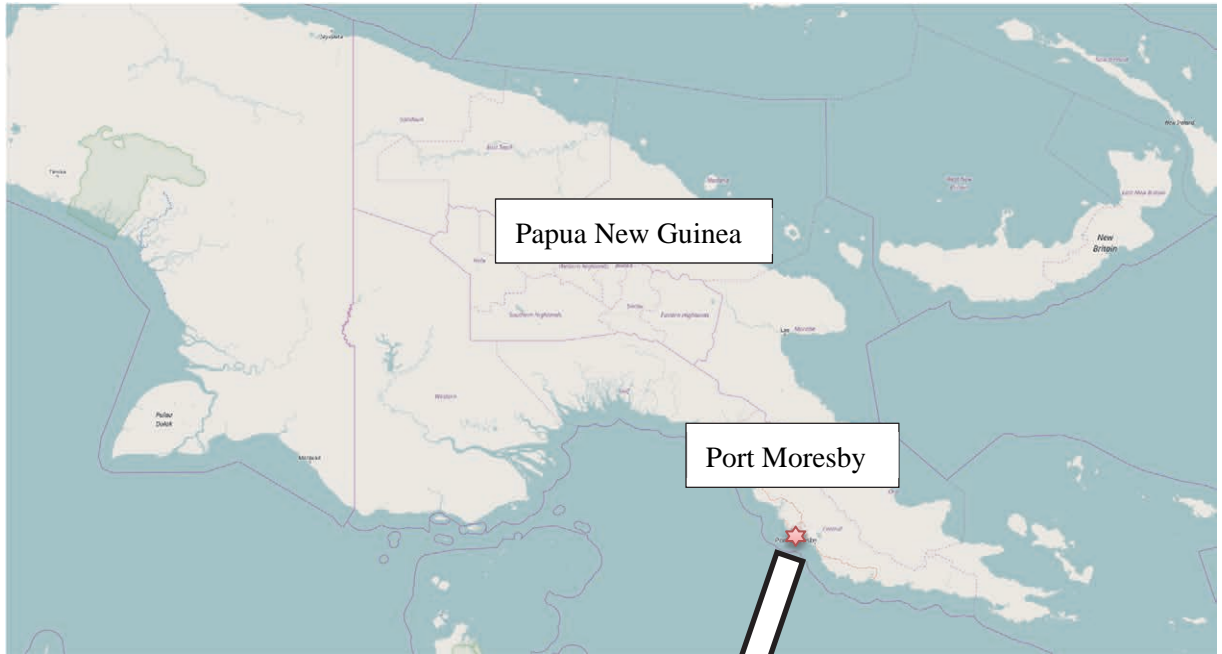
regarding safety management in ODA Loan projects and occupational safety and health.

- (3) To conduct accident cause analysis on the accidents occurred in the projects from various aspects, and to extract issues to address for prevention of accidents and to make a proposal for improvement as a recommendation.
- (4) To hold a seminar with attendance of the Employer, the Engineer, the Contractor, the Subcontractor etc. in which the following topics are presented.
  - (i) Outline of the Study results
  - (ii) Introduction of current situation of accidents in construction industry and examples of accident prevention measures taken in Japan
  - (iii) Introduction of “The Guidance for the Management of Safety for Construction Works in Japanese ODA Projects” (hereinafter referred to as “JICA Guidance”)

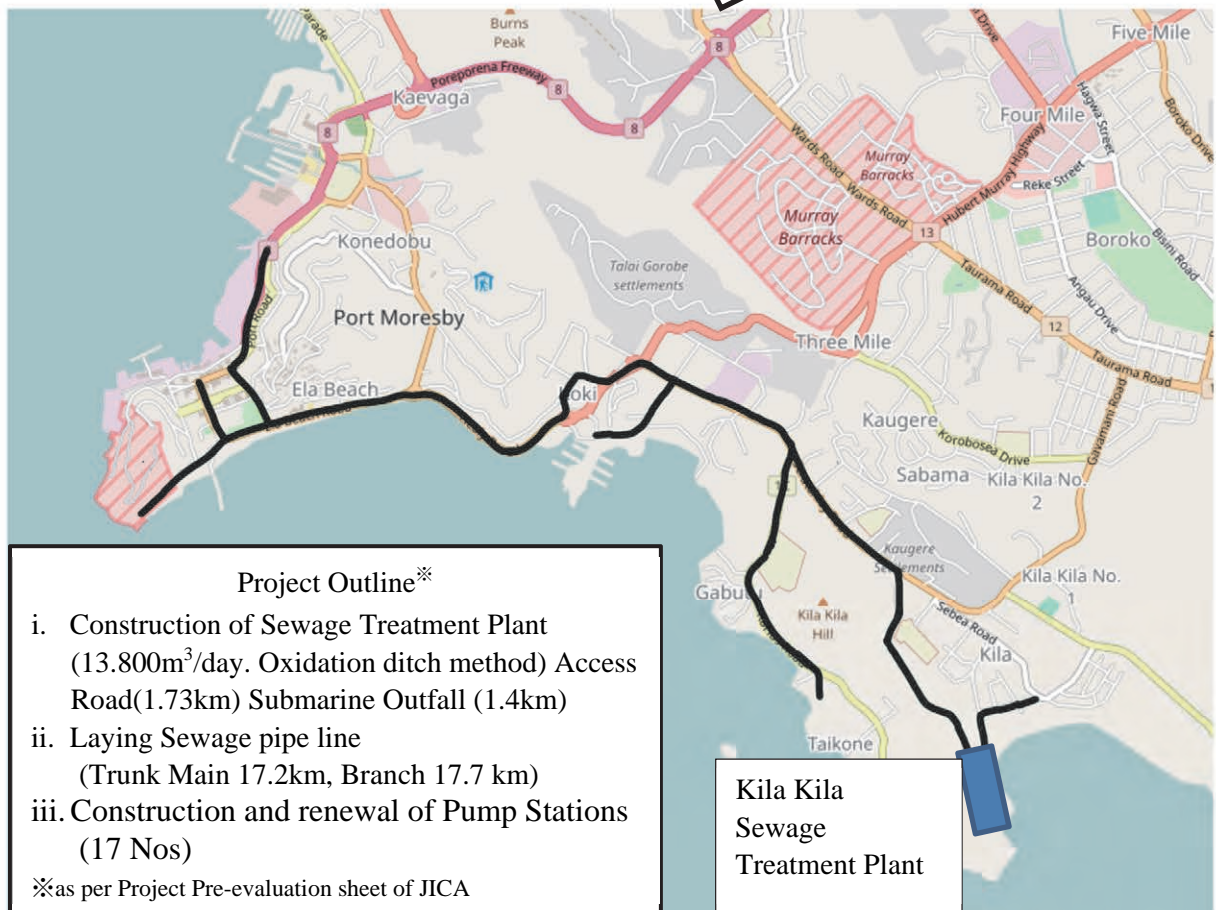
## 1.2 Details of the Project

**Table 1-1 Project in Papua New Guinea**

Site Country	Project Name	Loan Agreement		The Engineer
		Date	Amount approved	
Port Moresby, The Independent State of Papua New Guinea	Port Moresby Sewerage System Upgrading Project	29th January 2010	¥8,261 Million (STEP)	NJS Consultants Ltd.
The Employer	The Contractor	Outline of the Project		
Kumul Consolidated Holdings Operator: EDA RANU	Dai Nippon Construction and Hitachi Ltd. JV	By upgrading the existing sewerage system at coastal area of Port Moresby City, sewerage service will be provided to the same area and control outfall of foul water to coastal sea. It contributes to improvement of living environment of residents of the same area and to the industrial vitalization.		



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**Figure 1-1 Project Location**

<sup>2</sup> <http://www.openstreetmap.org/copyright/en> , <https://creativecommons.org/licenses/by-sa/2.0/>

### 1.3 Study Team Members

**Table 1-2 Study Team Members**

Name	Position	Company	Remarks
MITANI Katsuaki	Team Leader/ Safety Management	IPMS <sup>3</sup>	
IKENAGA Tetsuo	Safety and Accident Prevention Measures 1	KEI <sup>4</sup>	
KADOONO Hitoshi	Safety and Accident Prevention Measures 2	IPMS	Only for analysis and assessment in Japan

### 1.4 Study Schedule

**Table 2-1 Study Schedule in Papua New Guinea**

Number of day	Day January 2017			Activities	Place
1	14	Sat.	PM	Travelling Narita 21:05 → → 04:55 Port Moresby (PX 055)	Port Moresby
2	15	Sun.	AM		
			PM	Internal Meeting	
3	16	Mon.	AM	9:45 JICA Papua New Guinea Office: Inauguration Meeting	
			PM	14:00 DOLIR Hearing	
4	17	Tue.	AM	Internal Meeting	
			PM	13:00 the Enginner (NJS) Hearing 14:30 the Contractor (DH-JV) Pre-Meeting	
5	18	Wed.	AM	9:50 Site Visit with the Employer (KCH) , NJS and DH-JV for Sewage Treatment Plant (STP) Site	
			PM	13:45 KCH Hearing 14:30 DOLIR Meeting	
6	19	Thu.	AM	9:45 DH-JV Hearing	
			PM	14:00 Attended Joint Safety Inspection for Access Road as observers 15:00 DH-JV Hearing	
7	20	Fri.	AM	9:30 DH-JV Hearing	
			PM	14:00 the Subcontractor (AES) Hearing	
8	21	Sat.	AM	Data Compilation	
			PM		
9	22	Sun.	AM	Preparation for Seminar	
			PM		
10	23	Mon.	AM	10:00 Report to KCH	
			PM	14:00 Holding Seminar	
11	24	Tue.	AM	Preparation of report 10:00 DOLIR Meeting	
			PM	15:00 Report to JICA PNG Office	
12	25	Wed.	AM		
			PM	Travelling Port Moresby 14:10 → → 19:55 Narita (PX 054)	

<sup>3</sup> IPMS: IPMS Services Co., Ltd.

<sup>4</sup> KEI: Katahira & Engineers International

## 1.5 Interviewees

### 1.5.1 Project Related Organization and Persons

- (1) JICA Papua New Guinea Office

Mr. Takashi Toyama	Chief Representative
Mr. Yoshihiko Chujo	Senior Representative
Mr. Yukihiro Kondo	Representative
Mr. Yusuke Nii	Assistant Representative (Project Formulation)
Mr. Thomas Samson	Program Officer
- (2) Kumul Consolidated Holdings (KCH), Port Moresby Sewerage System Upgrading Project

Mr. Dominic Beange	Deputy General Manager
Mr. John Relhang	Senior Project Manager
Mr. Aloysius Aihi	Project Manager
Mr. Steven Yatukoman	Safety Manager (EDA RANU)
- (3) NJS Consultants Co, Ltd. (NJS), Port Moresby Sewerage System Upgrading Project Office

Mr. Takeyuki Shimofuji	Project Manager
Mr. Fabien Nitrosso	Resident Engineer
Mr. Sofuku Iwaki	Mechanical & Pipeline Engineer
Mr. Hideo Honjo	Sewage Treatment Plant (STP) Engineer
- (4) Dai Nippon-Hitachi JV (DH-JV), Port Moresby Sewerage System Upgrading Project Office

Mr. Shigeru Kawakami	Project Director
Mr. Yutaka Ozawa	Safety Manager
Mr. Timoteo Edgard C De Bozh	Safety Engineer
- (5) Avenell Engineering Systems Ltd. (AES)

Mr. Danny Zamudio	Operations Manager
Mr. Watson Tonari	Safety Manager

### 1.5.2 Safety Related Organization and Persons

- (1) Department of Labour & Industrial Relations (DOLIR), Occupational Safety & Health Office

Mr. Donald Lunen	Executive Manager
Mr. Lama Maila	Occupational Safety & Health Inspector



## Chapter 2 Current Construction Safety Situation in Papua New Guinea

### 2.1 Outlook of the Economy

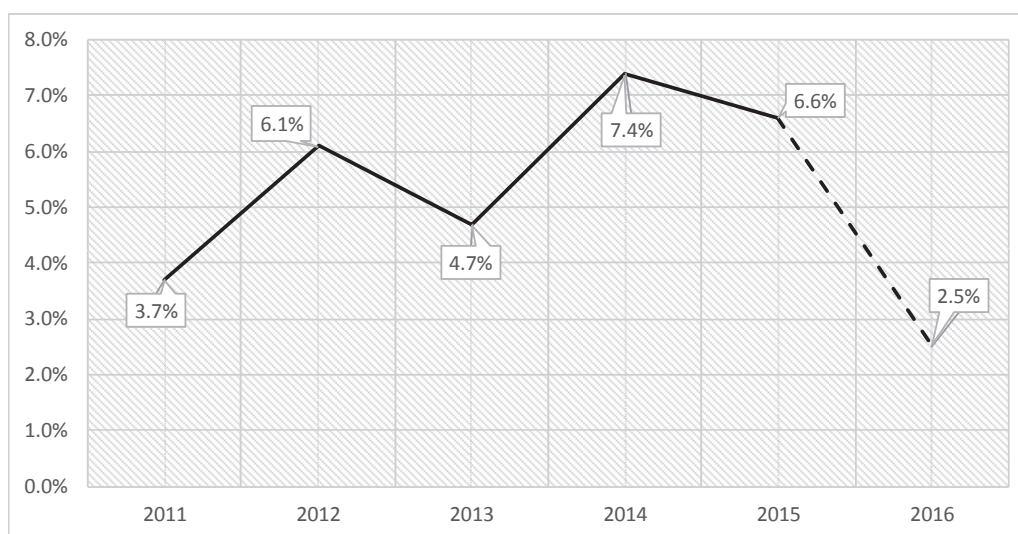
General Information of Papua New Guinea (PNG) is shown in Table 2-1.

**Table 2-1 General Information**

Item	Description	Item	Description
Capital	Port Moresby	Population	7.7million (Year 2015)
Area	452,860km <sup>2</sup> (1.25times of that of Japan)	Currency	Kina (PGK), Toea
Head of State	HM Queen Elizabeth II, represented by Governor-General	Official Language	Tok Pidin, English and Hiri Motu
		Head of Government	Prime Minister

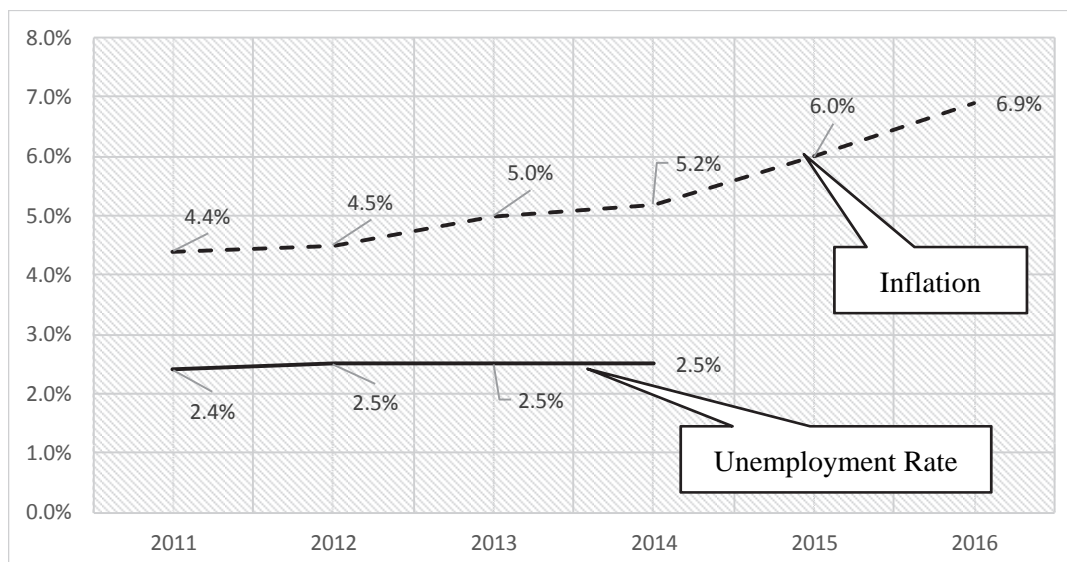
Source of Tables and Figures in 2.1: Fact Sheets compiled by Department of Foreign Affairs and Trade of Australian Government, unless otherwise stated.

The PNG Economy has achieved positive growth. Trends of Real GDP Growth from 2011 to 2016 (forecast) are shown in Figure 2-1, while those for the Unemployment Rate and Inflation Rate for the same period are shown in Figure 2-2 on the next page.



**Figure 2-1 Real GDP Growth**

Till 2014, improved economic activities were spearheaded by the export sector; reflecting increased production of mining and non-mining products, a price increase and favourable climatic conditions. The increase in exports stabilised the exchange market and boosted foreign currency reserves. In the domestic market meanwhile, growth of the private market and employment was observed. In June 2014, the supply of Liquefied Natural Gas (LNG) was commenced and significant GDP growth was expected to ensue. However, the decline in the price of oil and mining products in the international market and drought damage meant GDP growth failed to reach the level originally expected.



**Figure 2-2 Unemployment Rate and Inflation Rate**

In terms of export destination, although Australia usually dominated as the former colonial power, 2015 saw the ranking change. Countries having concluded long-term supply contracts for LNG are top-ranked here, such as Japan (Tokyo Electric Power Company and Osaka Gas Co., Ltd.), China and Taiwan.

**Table 2-2 Principal sources of exports and imports (2015)**

	Export	%		Import	%
1	Japan	17.4	1	Australia	25.9
2	Australia	15.9	2	China	20.0
3	China	12.1	3	Singapore	12.6
4	Taiwan	4.1	4	Malaysia	7.2

Table 2-3 shows Japan's ODA disbursements to PNG by Fiscal Year.

The Port Moresby Sewerage Upgrading Project is a Loan Aid project following the Strengthening of the Ramu Transmission System Reinforcement Project in Fiscal Year 2012.

**Table 2-3 Japan's ODA Disbursements to PNG**

(Gross disbursements: ¥100million)

Fiscal Year	Loan Aid	Grant Aid	Technical Corporation
2010	-	13.53	9.19
2011	-	12.32	11.13
2012	83.40	9.73	9.42
2013	-	10.38	11.65
2014	-	32.66	14.94
Total (FY2014)	787.86	420.26	314.73

Source: Japan's ODA Data for Papua New Guinea, web of Ministry of Foreign Affairs in Japan

## 2.2 The Prospect of the Construction Industry

Approx. 16,000 workers/day, equivalent to approx. 4% of all workers in the construction industry according to the 2011 Census, were employed by the LNG project, which started supplying LNG in 2014. On completion of its construction, only hundreds of workers were engaged in its operation and maintenance. Planning of the next LNG project is underway with the supply launch scheduled for the early 2020s.

PNG Government revenue for 2015 was reduced due to declining prices of oil and mining products on the International market and damage from the drought. The PNG Government was obliged to reconsider the priority of its budget allocation to projects. The Mid-Year Economic and Fiscal Outlook Report, 2015, issued by the Treasury Department, included the view that the budget would be continuously allocated to projects included in the MTDP: Medium -Term Development Plan 2011- 2015<sup>5</sup>and its allocation was committed to in the budget for 2015, regardless of the above reconsideration.

Strategies for improving the business environment were stated in MTDP2 2016-2017, which succeeds MTDP 2011-2015 and aligns the planning process to the five-year political cycle. Expansion of private investment into construction, manufacturing, mining and agriculture sectors was also included.

To implement the Public Private Partnership (PPP), a new Public Private Partnership Act 2014 (PPP Act) was passed in September 2014 and certified in October 2014. The Asian Development Bank assisted in implementing the PPP Act, which included establishing the PPP Centre to assist with/support the formation, tender and execution of PPP projects. The key issue when procuring PPP projects under the PPP Act is the delay in establishing the PPP Centre, which plays an important role in the above-mentioned.

Based on the Development Strategic Plan/MTDPs, various infrastructure projects are being planned and constructed, such as road networks, mixed-use urban development, Lae Port renovation, Nadzab (Lae) Airport, high-end housing, social housing and Ramu 2 Power generation.

## 2.3 Legislative System

Laws and regulations on construction safety management are shown in Table 2-4. The Industrial Safety, Health and Welfare Act 1961 (ISHW Act), its Regulation 1965 and Industrial Safety Orders issued based on the ISHW Act are valid in January 2017.

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<sup>5</sup> Medium Term Development Plan 2011-2015: PNG Government has made DSP: Development Strategic Plan 2010-2030 which includes detailed strategy for achieving PAPUA NEW GUINEA VISION 2050 which states a long-term target of PNG by 2050, and Medium Term Development Plan 2011-2015 which is a five-year plan made for accomplishing DSP and it includes grounds for investments.

**Table 2-4 Industrial Health and Safety Law**

Year	Name of Laws, Regulation and Industrial Safety Order related to Construction	Name of those other than construction
1961	Industrial Safety, Health and Welfare Act 1961	
1965	Industrial Safety, Health and Welfare Regulation 1965	
	Industrial Safety (Tractors and Earthmoving and Mobile Construction Equipment) Order 1965	
1967	Industrial Safety (Building Works) Order 1967	
1968	Industrial Safety (Excavation Works, Shafts and Tunnels) Order 1968	Industrial Safety (Lifts) Order 1968
1977		Mining (Safety) Act 1977

Although Industrial Orders were issued in 1971, 1973 and 1975, they are unrelated to construction and not listed in Table 2-4.

## 2.4 Outline of Key Laws and Regulations

### 2.4.1 Industrial Safety, Health and Welfare Act 1961 (ISHW Act)

As per Article 2 (2) of the ISHW Act, it excludes mines etc. to which the Mining (Safety) Act 1977 applies. The Table of Contents of the ISHW Act is shown in Table 2-5.

**Table 2-5 Table of Contents of the ISHW Act**

Section	Title	Section	Title
	Part I. - Preliminary	13	Appeals
1	Interpretation	14	Report of offences against other legislation
2	Application		Part IV. - Registration of Factories
3	Factories	15	Requirement of registration
	Part II. - Administration	16	Application for registration
4	Administration of Act	17	Registration, etc.
5	Industrial Safety Officers	18	Certificates of registration and permits to occupy
6	Medical Officers	19	Period of registration
7	Delegation	20	Reasons for failure to register, etc.
8	Exemptions	21	Vacation of premises
9	Reports (to Prime Minister)	22	Alteration of business, premises, etc.
	Part III. - Inspection and General	23	Cancellation of registration
10	Power of inspection	24	Failure to pay fees
11	Orders and directions	25	Applications in respect of more than one factory
12	Prohibition of use of certain machines or appliances		

Article	Title	Article	Title
26	Approval for erection, etc.	38	Ventilation, etc., in certain kinds of work
27	Notification of defects	39	Protection from dust, fluff, fumes, etc.
28	Authority to occupy temporary premises	40	Work in Confined Spaces
	Part V. - Conditions of Work Division 1 General Provisions	41	<b>Particular safety responsibilities of employees</b>
29	Cleanliness, space and ventilation	42	Declaration of dangerous trades, occupations and processes
30	Meals	43	Orders
31	Sanitary and ablution facilities	44	Application of declarations of dangerous trades and Industrial Safety Orders
32	Means of access		Part VI. - Miscellaneous
33	First-aid facilities and personnel	45	Obstruction, etc.
34	Notification of disease or injury	46	Unlawful use of buildings, etc.
	Part V-Division 2 Particular Provisions	47	Institution of proceedings, etc.
35	Dangerous work	48	Relation of this Act to other laws
36	Installation, operation and maintenance of boilers, etc.	49	Application of Standard Codes
37	Clothing, etc., of employees working with machinery	50	Regulations

The fundamental requirements are deemed covered by the ISHW Act, such as Inspection by the Industrial Safety Officer, First-aid facilities and personnel, Notification of disease or injury, Part V Working Conditions Division 2 Particular Provisions which state safety requirements for works requiring particular attentions of both employers and employees.

(refer to Section 35 to Section 44 of the above table)

It is noted that while Section 41 specifies the safety responsibilities of employees, such laws generally only the safety responsibilities of employers.

*Section 41 Particular safety responsibilities of employees*

*An employee who fails—*

*(a) to immediately report to his employer any defect that he discovers in any boiler, pressure vessel, machinery, driving belt, electrical equipment, fitting, appliance or tool; or*

*(b) to pay due regard to all warnings issued to him as to the risk in which he is involved in the performance of his duties; or*

*(c) to take such measures as he is required to take to reduce such risks to a minimum;*

*or*

*(d) to make proper use of all safeguards, safety devices, protective clothing and equipment, and other appliances furnished for his protection, is guilty of an offence.*

*Penalty: A fine not exceeding K100.00.*

#### 2.4.2 Industrial Safety, Health and Welfare Regulation 1965

An outline of the ISHW Regulation based on the ISHW Act is shown in Table 2-6.

**Table 2-6 Outline of the ISHW Regulation**

Part	Section	Contents
Part I- Preliminary	1	Interpretation of “approved”
Part II- Administration	2	Certificate of appointment of Industrial Safety Officer (Form 1)
Part III- Registration, etc. of Factories	3-6	Application for Registration (Form 2), Certificate of Registration (Form 3), Permit (Form 4), Registration Fees, Application for Approval or alter Factory (Form 5)
Part IV- Conditions of work	7-16 17-18 19	Work space, Lighting, Closets, urinals, etc., Wash basins, Showers, Change-rooms, rest-rooms, lockers, etc., Drinking water, Means of access, etc., Service areas, Barriers First-aid personnel, First-aid facilities Notification of disease or injury (Form 6)
Part V- Boilers and Pressure Vessels	20-30	Detailed regulations for use of Boilers and Pressure Vessels. Application of Registration (Form 7), Certificate of Registration (Form 8), Certificate of Inspection (Form 9)
Part VI- Sawmilling and Woodworking	31-67	Woodworking general, Circular Saw, Band Saw, Planning Machine, Log carriages, Sawmilling and Woodworking Operations generally
Part VII- Miscellaneous	68	Work restriction on Incompetent Workers

#### 2.4.3 Industrial Safety Orders

Among the Industrial Safety Orders issued based on the ISHW Act, outlines of the following three Orders related to Construction are shown in Table 2-7:

**Table 2-7 Outlines of Orders related to Construction**

Name of Orders	Contents
Industrial Safety (Tractors and Earthmoving and Mobile Construction Equipment) Order 1965	General Safety Provisions for Mobile Construction Equipment  1 Interpretation. 2 Logging Operations. 3 Excavation Operations. 4 Protective Clothing, etc. 5 Unattended Equipment. 6 Unauthorised Persons Riding on Equipment. 7 Maintenance. 8 Fuelling. 9 Warning Signs.
Industrial Safety (Building Works) Order 1967	With respect to Building works, safety provisions for general activities are included. Cranes are included in Part VI.  Part I Preliminary. (reference is made to the Standards Association of Australia “Code for Fixed Platforms, Walkways, Stairways and Ladders” (AS 1657-1974)) Part II Safety Generally. (Person carrying out Building Work to provide Safety Measures, Fencing of Platforms, etc., Stability of walls, Protection in Lift wells or Stair wells, Temporary ramps, protection of footpaths, etc.) Part III Ladders. Part IV Scaffolding. Part V Trestle Ladders. Part VI Cranes and Hoists. (reference is made to the Standards Association of Australia “Code No. C.B.2.” <sup>6</sup> ) Part VII Work on Roofs of Brittle Materials.
Industrial Safety (Excavation Works, Shafts and Tunnels) Order 1968	“Excavation work” includes any quarry, clay pit, gravel pit, sand pit, trench or any similar type or excavation made for the purpose of obtaining construction materials or for constructional purposes. Provisions for excavation work are included in Part VII.  Part I Preliminary. (Interpretation and Liability of Operator, etc.) Part II Ventilation. Part III Winding and Signals in Shaft Excavation Operations. Part IV Ladders and Travelling Ways. Part V Special Safety and Protection. Part VI Internal Combustion Engines Underground. Part VII Trenches.

## 2.5 Construction Safety Control Structure

### 2.5.1 Relevant Agencies’ Responsibility

#### 2.5.1.1 Department of Labour and Industrial Relations (DOLIR)

The DOLIR is responsible for administering and enforcing the ISHW Act, and the Safety and Health activities specified in the ISHW Act are executed by DOLIR, such as Inspections of workplaces by Industrial Safety Officers. Under DOLIR, the National Training Council (NTC) carries out Education/ Training/ Accreditation of education/training organisations etc.

<sup>6</sup> Australian Standard Rules for the DESIGN, CONSTRUCTION, ERECTION, TESTING, OPERATION, MAINTENANCE AND INSPECTION OF CRANES AND HOISTS, known as SAA CRANE AND HOIST CODE.

DOLIR recognises that the ISHW Act was made for Factories and is unsuitable for current conditions of all modernised industries. A new act (tentatively named Occupational Safety and Health Act) will be enacted within 2017.

#### 2.5.1.2 Investment Promotion Authority (IPA)

In PNG, there is no registration system for the construction industry. However, when a foreign company wishes to do business in PNG, it should apply to the IPA for a “Certificate for Registration for Overseas Company”. Subsequently, within 14 days of obtaining the above Certificate, it should also apply to the IPA for an “Investment Promotion Authority Certificate”. IPA will evaluate the application and provided it is acceptable to the IPA, issue a Certificate within 35 working days of receiving the complete application.

#### 2.5.2 Contractor’s Responsibility

The Contractor’s responsibilities regarding Construction Safety and Health are specified as employer’s responsibilities against employees under the ISHW Act, which applies to all industries. The investors (clients) may impose additional requirements through construction contract agreements.

### 2.6 Registration of Qualifications, Etc.

#### 2.6.1 Trade Licence

DOLIR issues Trade licences for the following trades; based on the Trade Licensing Act 1969 and Trade Licensing Regulation 1974:

- (a) Plumber/Drainers
- (b) Gas Fitter
- (c) Welder
- (d) Steam Boiler Attending
- (e) Others

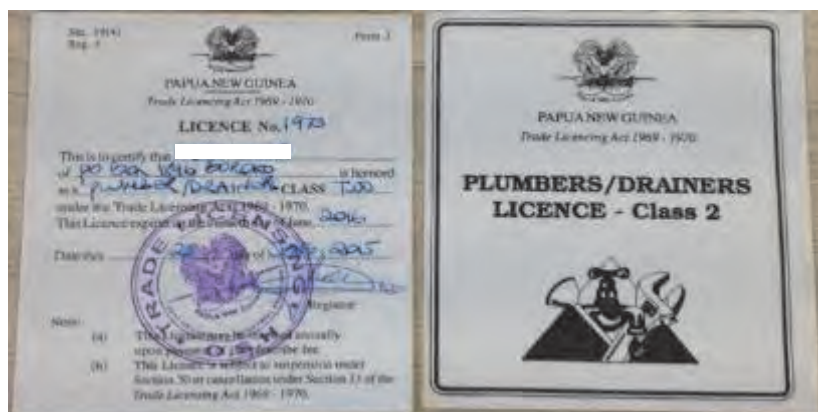


Figure 2-3 Samples of Trade Licences

Regarding the Trade Licence, if workers have licences in other countries, they can obtain PNG’s licences after DOLIR has checked licences in other countries and they pay licence fees.



#### 2.6.2 Operators for Cranes and Other Construction Machinery

Registered Training Organisations (RTOs) accredited by NTC under DOLIR open courses as a part of Technical and Vocational Education and Training (TVET) and issue a certificate with an NTC accreditation number. When a certificate holder goes to Motor Vehicle Insurance Limited, a state entity and pays a registration fee, his/her operator qualification is added to his/her licence card.

#### 2.6.3 Registration of Cranes and Other Construction Machinery

As well as track cranes, crawler cranes can also be registered to Motor Vehicle Insurance Limited.

#### 2.6.4 Qualification of Safety Officer

A qualification of Safety Officer is not specified under laws and regulations in PNG. However, training courses for Safety Officers are held by Registered Training Organisations under NTC, with courses allowing qualification of Safety Officers in Australia or other countries to be obtained.

## Chapter 3 Safety Review on Site

### 3.1 Project Outline

The Project Outline is shown in Table 3-1.

**Table 3-1 Project Outline**

Item	Contents
Project Name	Port Moresby Sewerage System Upgrading Project (POMSSUP)
Loan Agreement (L/A)	JICA Loan No. PN-P9 signed on 29 January 2010 Amount approved : 8,261million JPY (Total Project Cost : 10,802million JPY)
Project Purpose	By upgrading the existing sewerage system at coastal area of Port Moresby City, sewerage service will be provided to the same area and control outfall of foul water to coastal sea. It contributes to improvement of living environment of residents of the same area and to the industrial vitalisation.
Project Site	Port Moresby
The Employer	Kumul Consolidated Holdings (Name was changed by organisational reform. At the time of L/A signing, the Employer was Independent Public Business Corporation, IPBC) Operation and Maintenance will be carried out by EDA RANU
Consultant	NJS Consultants Co., Ltd. (NJS) The Engineer under Construction Contract is NJS Consultants Co., Ltd.
The Contractor	A joint venture of Dai Nippon Construction-Hitachi Ltd. (DH-JV)
Time for Completion (Original)	1,300 days from 20 April 2016
Scope of the Works (Original)	
Sewer Pipes	Branch Sewer Pipes (Gravity uPVC DN100~DN225) 13,154m
	Trunk Sewer Main Pipes (Pressure/Gravity HDPE, DN125~DN800) 12,409m
Pump Station	New four sites, Reconstruction five sites, Rehabilitation four sites
Sewage Treatment Plant (STP)	Required Treatment Capacity 18,400m <sup>3</sup> /day, SCADA <sup>7</sup> System 1set, Earth Work, Cutting 32,400m <sup>3</sup> , Embankment 71,300m <sup>3</sup> Grit Chamber 1No, Distribution Tank 1No, Oxidation Ditch 4Nos, Final Sedimentation Tank 4Nos, Sludge Pump Room 2 Nos. UV Disinfection Room 1No, Sludge Treatment Building 1No, Blower and electrical room 2Nos, Electrical Substation 1No, Administration Building 1No, In-Plant Yard Work Ocean Outfall: DN 900, PN 10 715m (underground) DN 900, PN 7 893m (under water) Mechanical and Electrical Works
Access Road	Access Road to Kila Kila Sewage Treatment Plant (STP) L=1,250m

<sup>7</sup> SCADA: an abbreviation of Supervisory Control And Data Acquisition

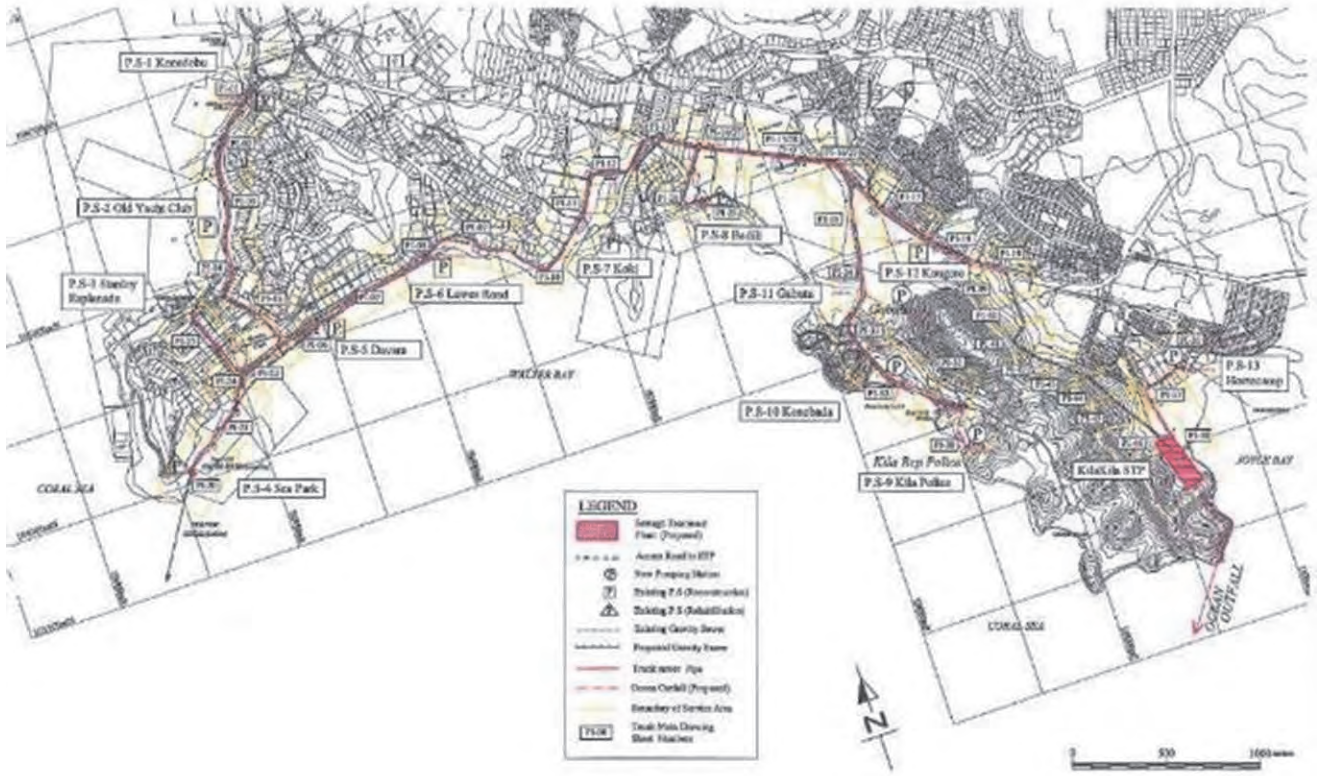


Figure 3-1 Project Scope (Sewer pipes and STP)

Source: NJS

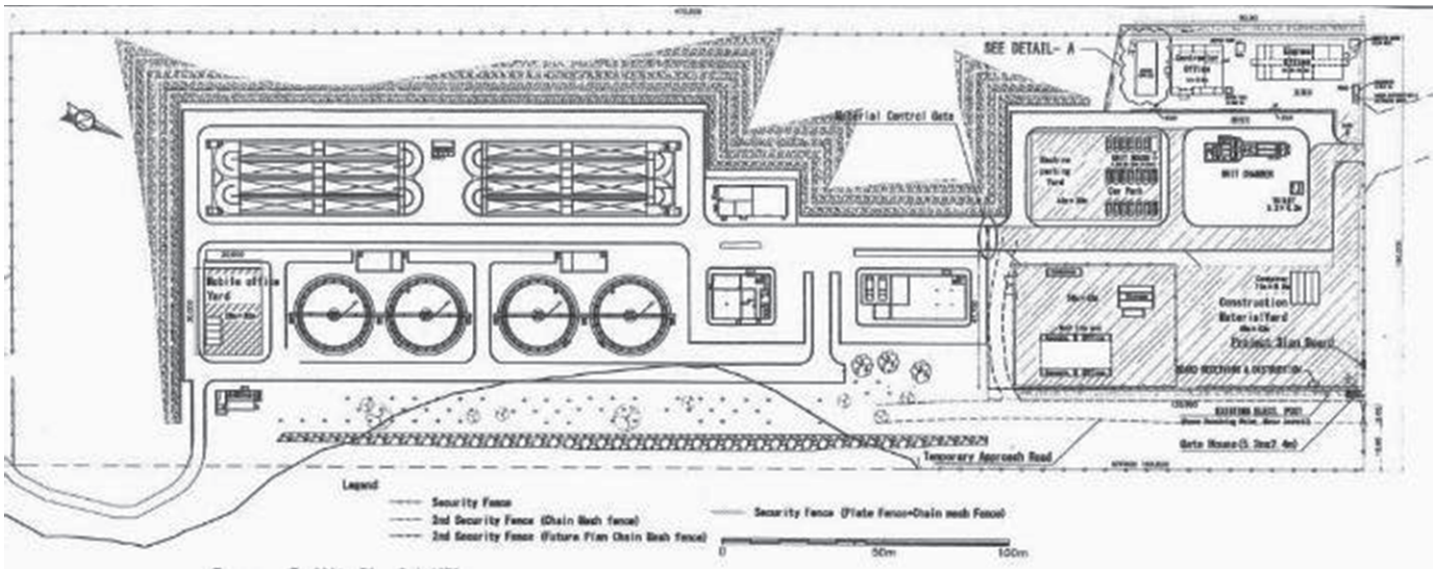


Figure 3-2 Layout of the Sewage Treatment Plant (STP)

Source: DH-JV

### 3.2 Project Organisation

(1) According to the Construction Contract of the Port Moresby Sewerage System Upgrading Project signed on 14 October 2015,

The Employer: Kumul Consolidated Holdings (KCH)

The Engineer: NJS Consultants Co., Ltd. (NJS)

The Contractor: Dai Nippon Construction-Hitachi Ltd. JV (DH-JV),

which is the typical triangle formation. FIDIC “Conditions of Contract for Construction MDB Harmonised Ed. June 2010” (MDB 2010) are applied as General Conditions.

(2) The number of staff for each organisation is stated below:

**Table 3-2 Number of staff**

Organisation	No. of staff
The Employer : KCH	According organisation chart, staff directly involved in site matters are 7, such as Senior PM, PM, Officer, Manager and a driver. In addition to KCH staff, eight staff from EDA RANU which includes a Safety Manager is deployed. PM and Safety Manager are resident on site.
The Engineer : NJS	Japanese staff 5, Filipino staff 4, Staff from US 2, total 11 persons. Approx. 15 persons are on site including local staff.
The Contractor : DH-JV	Approx. 60 (Japanese 12, Filipino staff 18 and local staff) Staff from Hitachi Ltd. are not resident now but they will take their posts as the project progresses. Number of workforce of four Subcontractors: approx. 340. Total approx. 400/day.

### 3.3 Contract for Consultant’s Services

The consulting services for the construction supervision of the Project are specified in the Contract for Consultant’s Services (Consultant Contract) between the Employer, IPBC (succeeded by KCH) and NJS. A time-based version of the General Conditions of Contracts adopted for the Consultant Contract, which is the standard for the JICA ODA Loan project. The clauses regarding Safety supervision in “3. General Terms of Reference” are excerpted as follows:

3. (2) *Scope of Consulting Services*

3) *Supervision and Monitoring of Construction Work*

*The Consultant shall perform his duties during construction period in accordance with the contracts to be executed between the Employer and the contractors. FIDIC MDB Harmonised Edition (2010) complemented with the Specific Provisions as included in the Standard Bidding Documents under Japanese ODA Loans for Procurement of Works will be applied to the civil works of the Project. In this context, the Consultant shall:*

5. Review and approve the proposals submitted by the contractors which include work program, method statements, material sources, manpower and equipment deployment etc. In light of Section 3.03<sup>8</sup> of Guidelines for the Employment of Consultants under Japanese ODA Loans (April 2012), the Consultant shall pay attention, in particular, to whether such proposals will meet the safety requirements set forth in the applicable laws and regulations, the specifications or other parts of the contract;
11. Supervise the works so that all the contractual requirements will be met by the contractors, including those in relation to i) quality of the works, ii) safety and iii) protection of the environment. In light of Section 3.03 of Guidelines for the Employment of Consultants under Japanese ODA Loans (April 2012), the Consultant shall confirm that an accident prevention officer<sup>9</sup> proposed by Contractor is duly assigned at the project site and that construction works are carried out according to the requirements set force in the applicable laws and regulations, the specifications or other parts of the contract;

The term “safety” cannot be found in the table which shows the minimum number of man-months for required international and local experts in item 3) of (4) Estimated Time Required To Complete the Project in the General Terms of Reference of the Consultant Contract. It is stated in the TOR but not the assignment table, which means each engineer in charge of construction supervision is also responsible for safety management of his/her section. It was acknowledged that NJS carried out his/her services with high awareness of safety.

### 3.4 Construction Contract

#### 3.4.1 Conditions of Contract

The Project applies MDB 2010 as General Conditions. Under these Conditions of Contract, clauses which specify the requirements regarding occupational safety, health and environment are as follows:

**Table 3-3 Related Clause for Occupational Safety and Health in MDB 2010**

Clause Number/ Title	Description
1 General Provisions	
1.1 Definitions 1.1.2 Parties and Persons	1.1.2.6 “Employer’s Personnel” means the Engineer, the assistants referred to in Sub-Clause 3.2 [Delegation by the Engineer] and all other staff, labour and other employees of the Engineer and of the Employer; and any other

<sup>8</sup> Guidelines for Employment of Consultants under Japanese ODA Loans, April 2012. Section 3.03 (4) states as follows. “(4) Safety shall be emphasised in the implementation of the project. The consulting services related to safety measures shall be specified, if necessary, in the Terms of Reference.”

<sup>9</sup> Accident prevention officer is in the Construction Contract Sub-Clause 6.7 Health and Safety.



Clause Number/ Title	Description
	<p>personnel notified to the Contractor, by the Employer or the Engineer, as Employer's Personnel.</p> <p>1.1.2.7 "Contractor's Personnel" means the Contractor's Representative and all personnel whom the Contractor utilises on Site, who may include the staff, labour and other employees of the Contractor and of each Subcontractor; and any other personnel assisting the Contractor in the execution of the Works.</p>
4 The Contractor	
4.8 Safety Procedures	Refer to MDB 2010
4.18 Protection of the Environment	
6 Staff and Labour	
6.1 Engagement of Staff and Labour	Refer to MDB 2010
6.2 Rates of Wages and Conditions of Labour	
6.4 Labour Laws	
6.6 Facilities for Staff and Labour	
6.7 Health and Safety	<p>The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor's Personnel. In collaboration with local health authorities, the Contractor shall ensure that medical staff, first -aid facilities, sick bay and ambulance service are available at all times at the Site and at any accommodation for Contractor's and Employer's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics.</p> <p>The Contractor shall appoint <b><u>an accident prevention officer</u></b> at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to issue instructions and take protective measures to prevent accidents. Throughout the execution of the Works, the Contractor shall provide whatever is required by this person to exercise this responsibility and authority.</p> <p>The Contractor shall send, to the Engineer, details of any accident as soon as practicable after its occurrence. The Contractor shall maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as the Engineer may reasonably require.</p> <p>HIV-AIDS Clause ----not quoted</p>

Clause Number/ Title	Description
6.13 Supply of Foodstuffs	Refer to MDB 2010
6.14 Supply of Water	
6.15 Measures against Insect and Pest Nuisance	
6.20 Forced Labour	
6.21 Child Labour	
6.23 Workers' Organisations	
6.24 Non-Discrimination and Equal Opportunity	

In the Project, the following conditions as shown in Table 3-4 were included in the Particular Conditions - Part B. These conditions further clarify the roles and responsibilities of the parties concerned.

**Table 3-4 Particular Conditions - Part B related to Safety and Health**

Clause Number/ Title	Description
4 The Contractor	
4.8 Safety Procedures	Add the following: Health and Safety regulation applied in PNG is: PNGS 1082-1991 Health and Safety at Work - Principles and Practice (AS 1470-1986). A Bidder shall obtain a (current) copy of standard from PNG National Standards office.
Insert new Sub-Clause 4.8.1 Priority to safety issues.	The Contractor must: (a) give priority to and is responsible for ensuring a safe place of work with safe work practices in relation to this Contract; (b) carry out the Works safely and so as to protect persons, property and the environment; and (c) Maintain appropriate safety precautions and programs so as to prevent injury to persons or damage to plant and/or property and the environment on, about or adjacent to the site or otherwise in carrying out the Works.
Insert new Sub-Clause 4.8.2 Unsafe work	If the Engineer/Employers Personnel considers: (a) there is a risk of injury to people or damage to property arising from the Works; or (b) there is an unsafe or potentially unsafe practice or breach of the requirements of this Clause 4.8.2, then, in addition to any other rights under this Contract, the Engineer/Employers Personnel may: (i) direct the Contractor to change its manner of working; or (ii) suspend the performance of the Works associated with the unsafe practice or breach, and not lift the suspension until the work area is made safe and the unsafe practice removed, or the breach rectified. All costs and delay and disruption caused by any action taken

Clause Number/ Title	Description
	under this Sub-Clause 4.8.2 are the responsibility of the Contractor.
Insert new Sub-Clause 4.8.3 Contractor not relieved.	The Contractor will not be relieved from compliance with any of its Contract obligations or from any of its liabilities whether under the Contract or otherwise according to law as a result of: (a) the implementation of, and compliance with, the requirements of any OHS&E Plan; (b) any direction or other action by the Engineer/Employers Personnel, or anyone else acting on behalf of the Employer, under this Clause 4.8.3; (c) any audit or other monitoring by the Engineer/Employers Personnel, or anyone else acting on behalf of the Employer, of the Contractor's compliance with the OHS&E Plan or the Contractors other obligations under this Clause 4.8.3 (d) any failure by the Engineer/Employers Personnel, or anyone else acting on behalf of the Employer, to detect any failure to comply with the OHS&E Plan or the Contractor's other obligations under this Clause 4.8.3, including where any such failure arises from any negligence on the part of the employer or other person.
Insert new Sub-Clause 4.8.4 Substantive breach.	(a) Where in the opinion of the Employer, the Contractor has committed a substantive breach of its obligations under this Clause 4.8.4; the Employer may terminate this Contract, by notice to the Contractor. (b) The remedy provided in this Sub-Clause 4.8.4 (i) applies notwithstanding any other provision of the Contract; and (ii) is in addition to the other remedies under this Contract.

### 3.4.2 Specification and BOQ

Requirements for Health and Safety are included in Section 01450 Health and Safety of Division 1. General Requirement of Standard Specification. Table 3-5 shows the items in Section 01450 Health and Safety.

**Table 3-5 Items in Section 01450 Health and Safety**

Item No.	Description
1.01	Safety and Security
1.02	First -Aid and Life-saving Apparatus
1.03	Electrical Safety
1.04	Warning and Safety Signs
1.05	Hazardous Material Identification
1.06	Guidelines to Safety In Sewers and Sanitary Structures



It is confirmed that a separate pay item for Health and Safety Requirement is provided in Section 1 General Requirement of BOQ, with Specification Reference 01450. Similarly, pay items for Warning Signage and Traffic Signage are provided in BOQ as pay items.

**Table 3-6 Pay Items related to Health and Safety in BOQ**

Specification Reference	Item No.	Description	Unit	Quantity
01500	21	Watching, Lighting and Guarding, Security	LS	1
01450	22	Health and Safety Requirement	LS	1
01570 01580	23	Signage and Traffic Diversion and Control - Project Sign Board, Road Safety Signage and Warning Signage	LS	1

### 3.4.3 Health and Safety Management Plan

The Safety Manager of DH-JV compiled a Health and Safety Management Plan Ver. B on 23 June 2016 and following an internal approval procedure of DH-JV, it was submitted, pursuant to the requirement of the Standard Specification, to NJS and KCH on 24 June 2016. In this Report, the Health and Safety Management Plan Ver. B, which was valid at the time of Safety Review, is referred to as the Safety Plan. The contents of the Safety Plan and a comparison of the Safety Plan, the contents of which are specified in The Guidance for Management of Safety of Construction Works in Japanese ODA Projects (JICA Guidance) are shown in Table 3-7. Items required in the JICA Guidance are included in the Safety Plan, although the order of clauses is not the same as that specified in JICA Guidance. Items (1) to (8) of JICA Guidance correspond to (1) Basic Policies for Safety Management, (2) Internal Organisational Structure for Safety Management, (3) Promotion of the PDCA Cycle, (4) Monitoring, (5) Safety Education and Training, (6) Voluntary Safety Management Activities, (7) Sharing Information and (8) Response to Emergency and Unforeseen Circumstances.

**Table 3-7 Comparison of Table of Contents of Safety Plan and that in JICA Guidance**

No.	Contents of the Safety Plan	page	Corresponding items of that in JICA Guidance <sup>10</sup>							
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.0	Purpose and Scope	5	✓							
2.0	Policy	5	✓							
3.0	Health and Safety Leadership and Commitment	6		✓						
4.0	Health and Safety Objectives	6	✓							

<sup>10</sup> A comparison is made with items in Clause 3.1.1 Items for inclusion of the Safety Plan of JICA Guidance.

No.	Contents of the Safety Plan	page	Corresponding items of that in JICA Guidance <sup>10</sup>							
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
5.0	Legal and other obligation	7	✓		✓					
6.0	Accountability and Responsibility	9		✓						
7.0	Induction	11					✓		✓	
8.0	Training and Competency	11					✓		✓	
9.0	Communication and Consultation	13			✓		✓	✓	✓	✓
10.0	Incident Management	18			✓			✓	✓	✓
11.0	Emergency Management	21								✓
12.0	Risk and Operational Control	21			✓					
13.0	Construction Safety Control	25			✓					
14.0	Plant Inspection and Maintenance	32			✓					
15.0	Injury Management	33			✓	✓			✓	
16.0	Occupational Health and Hygiene	33						✓		
17.0	House Keeping	34						✓		
18.0	Personal Protecting Equipment (PPE)	34					✓			
19.0	Traffic Management	35			✓		✓			
20.0	Site Security	36						✓		
21.0	Audit Inspection and Review	37			✓			✓		
22.0	Reporting, Monitoring and Review of Performance	37			✓	✓		✓		
Attachment										
1	DH-JV Health and Safety Policy	38	✓							
2	Head Contract Health and Safety Requirements	39	✓							
3	Sample Monthly Report	45			✓	✓				
4	Training Matrix	46					✓			
5	Site Plan (Fast Aid Station etc.)	47		✓					✓	
6	Daily Pre-Start Meeting Form	49			✓					
7	Incident/Accident Reporting Structure	51		✓	✓					
8	Accident/Incident Report Form	52			✓	✓				
9	Safe Work Method Statement Form	53			✓			✓		
10	Job Safety Analysis (JSA) Form	55			✓			✓		
11	Hazard Report Form	57			✓					
12	Lifting Gear and Harness Register	58					✓			
13	Electrical Equipment Register	59					✓			
14	Hazardous Substance Register	60					✓			

### 3.5 Safety Review on Site

#### 3.5.1 Current Progress

As per the Progress Report of DH-JV, the progress rate for the whole of the Project as of the end of December 2016 was 27.4%, which was nearly the same as that of Plan. Construction is ongoing for the start of operations of the major portion of works by the APEC General Meeting, targeted for late 2018.

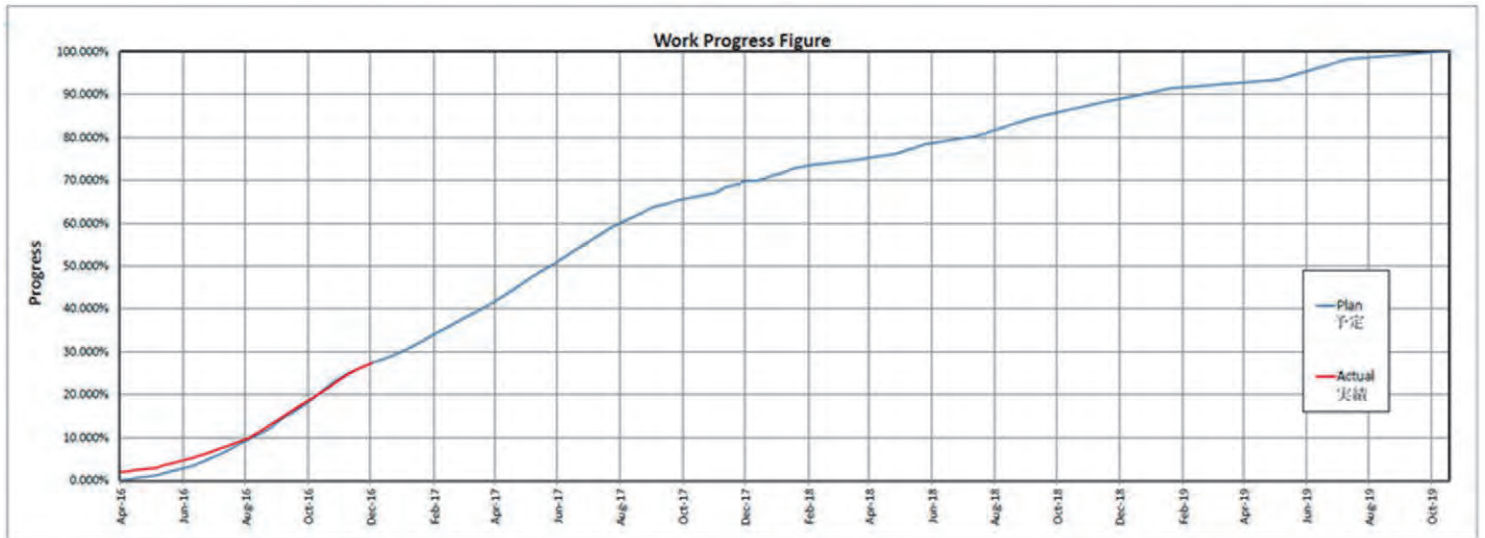


Figure 3-3 Work Progress Curve



Sewage Treatment Plan- View



Grit Chamber- Backfilling

Sludge Treatment Building-Foundation Excavation





Oxidation Ditch- Foundation works



Safety Signage- Deep Excavation



Final Sedimentation Tank- Re-bar works



Final Sedimentation Tank #4- Wall casting complete



Sludge Pump Room #2- Roof slab casting complete



Walkway



View of Slopes



Access Road to STP



Pre-Meeting before Joint Safety Inspection



Retaining System for laying pipes



Houses of Residents



Traffic Signage at the entrance of Access Road



Project Signboard and Kila Kila Primary School

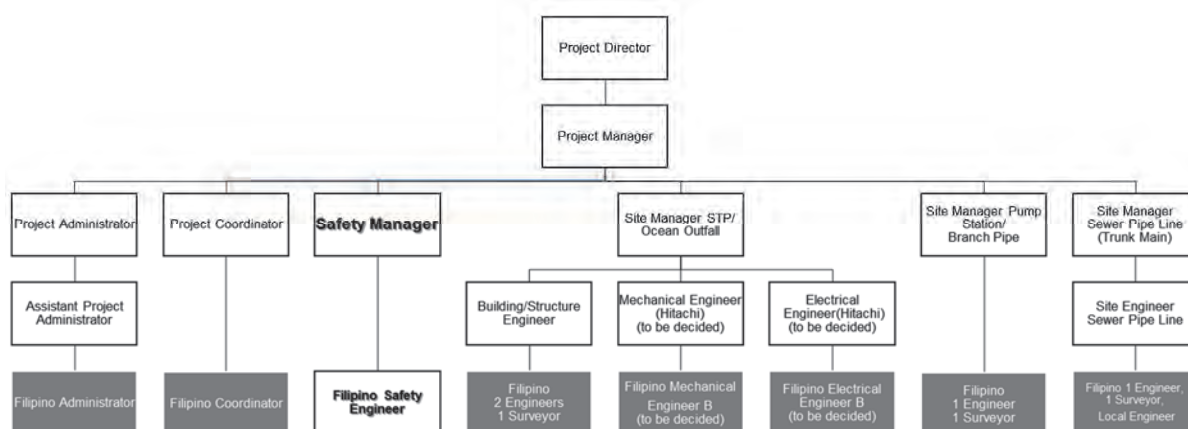


Temporary footpath for Students

### 3.5.2 Safety Management Activities

#### 3.5.2.1 Safety Management Organisation of the Contractor

The site organisation chart is shown in Figure 3-4.



**Figure 3-4 Site Organisation Chart of DH-JV**

Source: DH-JV, modified by Study Team

Filipino engineers, administrators etc., who have easy access to PNG, are assigned in the above organisation, while Japanese Site Managers carry out construction supervision with Filipino staff. With respect to Safety Management, a Japanese Safety Manager and Filipino Safety Engineer are assigned on a full-time basis. The Safety Manager is the accident prevention officer specified in Sub-Clause 6.7 Health and Safety of MDB 2010. The Study Team confirmed that the authorities specified in the above Sub-Clause were accorded to the Safety Manager by the Project Director of DH-JV.

*Extract form Sub-Clause 6.7 of MDB 2010*

*The Contractor shall appoint **an accident prevention officer** at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to issue instructions and take protective measures to prevent accidents. Throughout the execution of the Works, the Contractor shall provide whatever is required by this person to exercise this responsibility and authority.*

#### 3.5.2.2 Safety Policy and Safety Management System

Table 3-8 shows the Major points in the DH-JV Health, Safety and Environment Policy signed by the Project Director on 24 June 2016 in the Safety Plan. The Policy clearly states the roles of stakeholders involved in executions of works.

**Table 3-8 Summary of DH-JV Health, Safety and Environment Policy**

DH-JV will
<ul style="list-style-type: none"> <li>➤ ensure the safety, health and environmental protection of all our employees, company, subcontractors, suppliers and the communities that are likely to be impacted by the project.</li> <li>➤ manage and apply its Health, Safety and Environment Management System (HSE-MS) in</li> </ul>

such a manner that every employee shall be involved and ensure the effective implementation of our HSE-MS to assist in achieving the safe completion of POMSSUP Project.
<b>All Managers and Supervisors of the DH-JV have the responsibility</b>
<ul style="list-style-type: none"> <li>➤ to vigorously pursue safety, health and environmental awareness among all employees</li> <li>➤ to manage tools and equipment and to create a culture in which everyone shares responsibility for the wellbeing of their fellow workers, the community and environment</li> <li>➤ to ensure that machinery and equipment are safe and that work practices are in compliance with established legislation, workplace practices and procedures and, provision of adequate specific work task training to workers.</li> </ul>
<b>All employees of the DH-JV have the responsibility</b>
<ul style="list-style-type: none"> <li>➤ to execute their work activities in such a manner as to prevent all circumstances which could lead to incidents that may cause personal injury or illness, security incidents or environment damage.</li> <li>➤ to protect his/her health and safety and the health and safety of other workers by working in compliance with legislation and established workplace practices and procedures.</li> </ul>
Subcontractors and suppliers will be required to operate in accordance to the Health, Safety and Environment policy of DH-JV. Health and safety is an integral part of this organisation.

The Policy ends “The Dai Nippon - Hitachi JV shall implement this policy in combination with Health, Safety and Environmental laws, regulations, standards, policies and procedures of all applicable government agencies.”

The Policy includes the care of the communities affected, involvement of all employees and care of fellow workers etc. as necessary components to establish a culture of safety.

### 3.5.2.3 Compliance Status for Laws and Regulations

Section 5.0 of the Safety Plan lists the Laws and Regulations which apply to the Project. Outlines of laws and regulation related to Safety and Health are explained in 2.4 Outline of Key Laws and Regulations of this Report. Requirements for Health and Safety in the Conditions of Contract and Specifications are explained in 3.4 Construction Contract of the same.

Safety Management activities were carried out as per the Safety Plan. Lists of newcomers having attended induction training, qualification holders etc. and construction equipment were strictly controlled and managed in cooperation with subcontractors.

However, during the site safety review, it was observed that some important activities were not included in the Safety Plan and some activities used a method that differed from that specified in the Safety Plan, despite having the same effectiveness, Weekly Joint Safety Inspection, Daily Work and Safety Meeting etc. Amendments to the Safety Plan is necessary.

### 3.5.2.4 Typical daily working cycle

Table 3-9 shows the daily working cycle of DH-JV. At 7:00, one working day begins with a Morning Gathering, Radio Exercise, Safety Instruction and Liaison followed by Tool Box Meeting by the working group. Following a Pre-start check of Machinery and Facilities, works in the morning continue to 12:00 (for five hours). After taking a one-hour rest, 13:00 sees work in the afternoon commence till 16:00 (for three hours). Total working hours are 8 hours per day.

**Table 3-9 Typical daily working cycle**

Time	Activities	
7:00~	Morning Gathering	
7:10	Tool Box Meeting by working group	
	Pre-start check of Machinery and Facilities	
~12:00	Works in the morning	
~13:00	Rest	
13:00~	Works in the afternoon	13:00-13:30 Daily Work and Safety Meeting
16:00	End of the day	

From 13:00, staff of DH-JV, including Filipino staff and site representatives of subcontractors convene in the DH-JV Meeting Room and hold a Daily Work and Safety Meeting, as a statutory requirement in Japan.

### 3.5.2.5 Monthly Safety Committee Meeting

The activities of Safety Management carried out on site are shown in Table 3-10. Details of the activities are explained in the following clauses:

**Table 3-10 Safety Management Activities on Site**

Activity Description	Frequency	Participants			
		KCH	NJS	DH-JV	Subcontractors
Monthly Safety Committee Meeting	Monthly	○	○	●	
Weekly Joint Safety Inspection	Weekly	○	○	●	○
Daily Work and Safety Meeting	Daily			●	○

The Safety Committee comprises representatives of KCH/NJS/DH-JV and reviews and issues proposals, advices and recommendations on Safety Management activities performed by DH-JV as Project activities. The Agenda of the Monthly Committee Meeting is as follows:

- Review of last meeting minutes
- Review of Safety Statistics
- Review of Incidents for the month and results of Joint Safety Inspections
- Safety Audit Report by the KCH Safety Manager
- Plan and Review of Safety Management Activities/Events
- Any other business




In the Safety Committee Meeting for December 2016, the execution of a rescue simulation exercise and a fire drill were decided upon and DH-JV was preparing their plans.

3.5.2.6 Weekly Joint Safety Inspection

Every Thursday afternoon, a Joint Safety Inspection is carried out with KCH/NJS/DH-JV/major subcontractors in attendance. The Study Team joined it for the Access Road Works held on 19 January 2017 as observers.

Table 3-11 Instruction Sheet



INSTRUCTION SHEET No. 43 (SP-33)			
POMSSUP-01	CONSTRUCTION OF PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT		15-December-2016
Contract #	Project Title		Date
	Name	Position	Company
Attention		Project Manager	AES
		Project Manager	HEBCU
		Project Manager	DNC
CC		Project Director	DNC
		Building & Construction Mngr.	ABC
Site Location	STP Site and Access Road		
Safety Patrol conducted by the following representatives:			
Employer	Engineer	Contractor	Sub-contractor
<b>SAFETY</b>			
Following today's Safety Patrol between the representatives of Employer, Engineer, Contractor and Subcontractors, please take note of the following safety instructions that are numbered as agreed by the Engineer:		Corrective Actions	
		Action Plan	Target Completion Date / Status / Remarks
<b>STP Area</b>			
57	At Sludge Treatment Bldg., position the barricades at least 1.0 meter away from edge of excavation. (AES)	Reposition the barricades at least 1.0 meter from edge of excavation	18/12/16 Barricades repositioned at 1.0m from edge of excavation. (18/12/16)
58	At ODB, installed perimeter fence at excavation is too weak. Reinstall and/or reinforce. (AES)	Close the perimeter fence and install and/or reinforce with steel plate	16/12/16 Perimeter fence installed and reinforced with steel plate. (16/12/16)
<b>Access Road</b>			
59	Backfill the excavation at the Kaugere line and remove the fence. If some portion of excavation shall remain, provide steel plate. (DNC/HEB)	Backfill the excavation, deposit the stone and install steel plate where applicable	20/12/16 Excavation backfilled and steel plate installed. (20/12/16)
60	Leveling of ground at CH D beside the pressure test area. (DNC/HEB)	Level the ground as advised	21/12/16 Ground leveled as advised. (21/12/16)
61	At CH D, decide on the best traffic plan at this area. Engineer suggests to remove the bollards after curing of concrete and open the Access to residents with vehicles but block it somewhere CH 400. (DNC)	Decide on the best traffic plan at this area taking in consideration the Engineer's suggestions	22/12/16 At CH D, the best traffic plan is decided and bollards removed after concrete curing. Access is open to residents with vehicles but blocked at CH 400. (22/12/16)
Prepared by:	Name	Position	Company
	Mr. Y. Ozawa	Safety Manager	DNC
Received by:	Name	Position	Date
Employer		HGE	12/01/17
Engineer		Mechanical	Jan/13/2017

The Procedures of Inspection are as follows: the form of the Instruction Sheet used in a Joint Safety Inspection is shown in Table 3-11.

- (1) During an Inspection, when a member of the inspection team identifies an item which may induce accidents, he/she notifies DH-JV of the same.
- (2) DH-JV, with KCH/NJS, checks the situations and if confirmed, lists the details in the Instruction Sheet.

- (3) DH-JV, together with the subcontractor(s) responsible for such place or works, makes an action plan to rectify the situation, decides on the target completion date and inserts it in the Instruction Sheet.
- (4) KCH/NJS checks these and if practicable, gives consent. If impracticable, it points the same out and requests reconsideration.
- (5) During the next Inspection, the action plan and target completion date are checked. Items for which actions have been completed, after confirmation of actions complete has been recorded, will be deleted from the Instruction Sheet issued for the succeeding inspection.

In addition to Weekly Joint Safety Inspections, DH-JV carried out his/her own Safety Inspections. No.43 (SP 33) in Instruction Sheet in Table 3-11; comprising 33 Weekly Joint Safety Inspections (Safety Patrols) and ten of DH-JV's own Safety Inspections.

### 3.5.2.7 Daily Work and Safety Meeting

As explained in 3.5.2.4 Typical daily working cycle, a Daily Work and Safety Meeting (DWSM) is held at 13:00 in the DH-JV Meeting Room with staff of DH-JV, including Filipino staff and site representatives of subcontractors in attendance. The form used in DWSM is shown in Table 3-12.

**Table 3-12 Daily Work and Safety Instruction with the Daily Report**

Project Name: PNG 下名作量 (PNG FOM&UP Project)		Date of Work: 2017 January 1 2017		Responsible: JY		Date of Report: 2017 Jan 1 2017				
No.	Location / Work Item / Sub-Contractor	Name / Description of the Risk	Risk Rating				Equipment / Condition	Remarks / Safety Indicator	Site Status	Comments / Action
			Before	Current	Target	Control				
1	STP1 EASTPAPER	STP1 EASTPAPER - RISK OF FALLING OBJECTS	1	1	1	1	Good	Good	Good	
2	STP1 EASTPAPER	STP1 EASTPAPER - RISK OF COLLISION	1	1	1	1	Good	Good	Good	
3	STP1 EASTPAPER	STP1 EASTPAPER - RISK OF ELECTRICAL SHOCK	1	1	1	1	Good	Good	Good	
4	STP1 EASTPAPER	STP1 EASTPAPER - RISK OF TRIP AND FALL	1	1	1	1	Good	Good	Good	
5	STP1 EASTPAPER	STP1 EASTPAPER - RISK OF OVEREXHAUSTION	1	1	1	1	Good	Good	Good	
6	STP1 EASTPAPER	STP1 EASTPAPER - RISK OF SLIP AND FALL	1	1	1	1	Good	Good	Good	
7	STP1 EASTPAPER	STP1 EASTPAPER - RISK OF TRIP AND FALL	1	1	1	1	Good	Good	Good	
8	STP1 EASTPAPER	STP1 EASTPAPER - RISK OF TRIP AND FALL	1	1	1	1	Good	Good	Good	
9	STP1 EASTPAPER	STP1 EASTPAPER - RISK OF TRIP AND FALL	1	1	1	1	Good	Good	Good	
10	STP1 EASTPAPER	STP1 EASTPAPER - RISK OF TRIP AND FALL	1	1	1	1	Good	Good	Good	

In DWSM, the DH-JV staff establish liaison, coordination, interface management of subcontractors and/or construction activities and reconfirmation of construction procedures. At the same time, safety instructions/reminders regarding the scheduled activities are also advised to subcontractors. The contents of DWSM are documented in the Daily Work and Safety Instruction with a Daily Report. After obtaining the signatures of attendees, copies are distributed to attendees as a record of DWSM.

Items to be documented in the Daily Work and Safety Instruction with the Daily Report are as follows:

- Actual working record of current day: The schedule written the previous day is checked and amended in line with the actual progress of works.
- Schedule for the next day, including allocation of manpower, construction equipment, transportation of material/equipment, Inspection and Testing.
- Safety Instructions for scheduled activities and safety situations and safety measures taken on current day.

The Study Team confirmed that the items to be documented in the Daily Work and Safety Instruction with the Daily Report had been properly recorded.

### 3.6 Safety Statistics

The Safety Statistics presented by DH-JV in the Monthly Safety Committee meeting for December 2016 are shown in Table 3-13.

**Table 3-13 Safety Statistics for December 2016**

Item Description	December 2016			Year to date (Cumulative)		
	Fatalities	Non-Fatalities	Total	Fatalities	Non-Fatalities	Total
Employees (man-day)	7,341			67,058		
Total hours worked (man-hour)	58,728			536,464		
Casualty (person)	0	0	0	0	0	0
Lost-work time(day)	0	0	0	0	0	0
Lost-time(day)	0	0	0	0	0	0
AFR: Accident Frequency Rate (absence from work of at least one day)	0			0		
ASR: Accident Severity Rate	0			0		

DH-JV targets Zero Accidents<sup>11</sup> involving absence from work of at least one day. Accordingly, the Accident Frequency Rate (AFR) is also zero. As of the end of December 2016, Accidents were zero and the target was met. According to the statement of DH-JV Safety Manager, “Dai Nippon Construction (DNC), the leading firm of DH-JV, recognises Zero Accidents is unrealistic and DNC sets a corporate limit of AFR, which is not zero. However, for the individual site, there is no alternative but to set Zero Accidents as a target.”

**Table 3-14 Accident Frequency Rate in Japan** (absence from work of at least one day)

	Year-2014	Year-2015
General Contractor	0.91	0.92
Breakdown		
Civil	0.88	1.37
Architecture	0.92	0.85

Source: Table-3 at outline of result “Investigation of Occupational Accidents trend” press released by the Ministry of Health, Labour and Welfare in 2015

As a reference, AFR in Japan is shown in Table 3-14. Because the frequency rate is calculated for one million working hours, a simple calculation is made to obtain the corresponding number of Accidents.  $AFR=0.92$  for the General Contractor in 2015 and Cumulative Total man hours of the Project, 536,464 are used. The result is approx. 0.5.

$$\frac{536,464 \text{ hours}}{1,000,000 \text{ hours}} \times 0.92 = 0.49$$

Given the 27.4% progress achieved within 6 months of commencing the site works, the result obtained in the Project is acceptable compared to statistics in Japan.

It is noted that no public or third-party accidents had been recorded as of the end of December 2016.

<sup>11</sup> In this Sub-Clause, Accidents mean occupational accidents with injuries.



## Chapter 4 Observation During the Safety Review on Site

### 4.1 Education and Training

KCH organised Training Courses for First Aid, Working on Heights and Working in Confined Space from 13-16 April 2016 before construction activities commenced on site. Representatives of KCH/NJS/DH-JV attended. KCH will continue to provide relevant Safety Training, with the “Safety First” motto, throughout the construction and commissioning phases of POMSSUP.

Extract of KCH Web <https://www.kch.com.pg/pomssup-think-safety-first/>

#### **POMSSUP: THINK SAFETY FIRST**

Friday April 29, 2016 – KUMUL Consolidated Holdings (KCH) continues to maintain a high standard in the implementation and monitoring of Job Safety in the workplace to Best Industry Practices.

In preparation for the start of construction phase for Port Moresby Sewerage System Upgrading Project (POMSSUP), the company organised training courses on First Aid and “Working on Heights” “Confined Space” from the 13<sup>th</sup> -16<sup>th</sup> April 2016. The Motto of the workshop was “SAFETY FIRST”

Participants from KCH, Project Management Unit and Dai Nippon Hitachi JV, the Prime Contractor for POMSSUP, attended the courses and all took an active part in learning and upgrading their skills including their participation in practical demonstrations in the different areas of Safety during the course. This meeting also provided the opportunity for the employees of KCH & the Contractor to meet and share their knowledge and experiences in Safety Management.

KCH will continue to provide relevant Safety Training as an ongoing part of Trade Skills training throughout the construction and commissioning phases of POMSSUP.


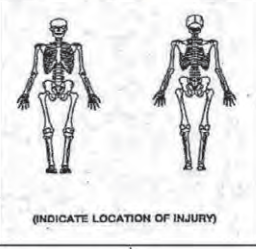
KCH is the implementing agency for POMSSUP, a key government project which will construct a State of the Art Sewerage Treatment Plant at Joyce Bay in Kilakila and rehabilitate existing infrastructure.

DH-JV carries out a Monthly Safety Gathering at the beginning of every month and organises education and training courses for workers, including subcontractors’ employees. To date, education and training courses for lifting works, crane works, Job Safety Analysis (JSA) etc. have been carried out.

### 4.2 Report of Accidents/Incidents

Even small incidents are reported as per the request of KCH using a specified Accident/Incident Report Form included in the Safety Plan. (refer to Table 4-1 in the next page). Reported Incidents are to be explained by the DH-JV Safety Manager and reviewed by attendees of the monthly Safety Committee Meeting.

**Table 4-1 Accident/Incident Report**

<b>ACCIDENT / INCIDENT REPORT</b>		 <small>DAI NIPPON CONSTRUCTION Inspire the Next</small> <b>DAI NIPPON - HITACHI JV</b>																																											
Form No: SF 00324																																													
<b>PROJECT NAME:</b>																																													
<input type="checkbox"/> <b>Serious Incident</b> involving fatality or serious injury or immediately life threatening <input type="checkbox"/> <b>Other Incident</b> involving workers compensation claim, lost time payment or not immediately life threatening <small>Notify WorkCover within 7 days.</small>																																													
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; padding: 2px;">ABOUT THE INCIDENT / ACCIDENT / INJURY</th> </tr> <tr> <td style="padding: 2px;">When did it happen?    /    /                      am/pm</td> </tr> <tr> <td style="padding: 2px;">Date &amp; time</td> </tr> <tr> <td style="padding: 2px;">Where did it happen?</td> </tr> <tr> <td style="padding: 2px;">Exact location</td> </tr> <tr> <td style="padding: 2px;">What happened?</td> </tr> <tr> <td style="padding: 2px;">Was a person injured?    <input type="checkbox"/> No    <input type="checkbox"/> Yes</td> </tr> <tr> <td style="padding: 2px;">What led up to the incident?</td> </tr> <tr> <td style="padding: 2px;">How exactly was the incident caused?</td> </tr> <tr> <td style="padding: 2px;">Did the injury result in the death of the person?    <input type="checkbox"/> No    <input type="checkbox"/> Yes</td> </tr> <tr> <td style="padding: 2px;">Did the injured person stop work or normal duties?    <input type="checkbox"/> No    <input type="checkbox"/> Yes</td> </tr> <tr> <td style="padding: 2px;">When did the person stop?    dd/mm/yy                      /                      /</td> </tr> <tr> <td style="padding: 2px;">Is the person expected to return to work?    <input type="checkbox"/> No    <input type="checkbox"/> Yes</td> </tr> <tr> <td style="padding: 2px;">What is the expected return date?    dd/mm/yy</td> </tr> <tr> <td style="padding: 2px;">Is the person likely to resume normal duties?    <input type="checkbox"/> No    <input type="checkbox"/> Yes</td> </tr> <tr> <td style="padding: 2px;">Will a rehabilitation plan be required?    <input type="checkbox"/> No    <input type="checkbox"/> Yes</td> </tr> <tr> <td style="padding: 2px;">Has a rehabilitation plan been drawn up?    <input type="checkbox"/> No    <input type="checkbox"/> Yes</td> </tr> <tr> <td style="padding: 2px;">Were there any witnesses?    <input type="checkbox"/> No    <input type="checkbox"/> Yes</td> </tr> <tr> <td style="padding: 2px;">Witness Name:    _____</td> </tr> <tr> <td style="padding: 2px;">Witness Phone Number:    _____</td> </tr> <tr> <td style="padding: 2px;">Witness Name:    _____</td> </tr> <tr> <td style="padding: 2px;">Witness Phone Number:    _____</td> </tr> <tr> <th style="text-align: left; padding: 2px;">DETAILS OF PERSON COMPLETING THIS REPORT</th> </tr> <tr> <td style="padding: 2px;">Name:    _____</td> </tr> <tr> <td style="padding: 2px;">Position:    _____</td> </tr> <tr> <td style="padding: 2px;">Date:    /    /    _____</td> </tr> </table>	ABOUT THE INCIDENT / ACCIDENT / INJURY	When did it happen?    /    /                      am/pm	Date & time	Where did it happen?	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**4.3 Accident Cause Analysis**

The Accident Cause Analysis is detailed in Clause 10.4 Investigation of an Incident of Safety Plan as follows:

*It is essential that incidents and **near misses** be investigated to identify casual factors and associated underlying systematic weakness (the root causes).*

It is specified that based on the consequences of incidents or near misses, the investigative level should be varied. Investigations are to be focused on incidents or near misses which have severe consequences. In Japan, Root Cause Analysis, as used in ISO Management Systems, becomes popular.

Clause 10.5 Communication of Lessons Learnt from Incidents: Safety Alert is included in the Safety Plan. This process is to be used to prevent the occurrence of accidents in other projects, which resemble those having occurred in the Project. A Safety Alert with the following items,

will be sent to member firms through the Safety Manager upon the judgement of the Project Director/Project Manager.


- Description of Incident
- Cause (casual factor, root cause) of Incident
- Photo (if relevant)
- Preventive measures required

However, it emerged that a collection of near misses was not included in the current DH-JV system. Improvement is required.

#### 4.4 Risk Assessment

A simple version of Risk Assessment, Job Safety Analysis (JSA) is applied on site. JSA was introduced in the LNG Project, which started supply in 2014 and JSA became widespread into construction sites in PNG. Sub-Clause 12.4.3 of the Safety Plan states that, as a general rule, JSA should be conducted if there is any doubt concerning job safety. JSA breaks a job into steps, the hazard of each of which is then identified. By identifying the hazard, a Risk Rating is given by combining the consequence with the likelihood, using a risk matrix. Based on the Risk Rating, the actions to be taken are shown on the next page.

**Table 4-2 Management Plan based on the Risk Level**

	<b>JOB SAFETY ANALYSIS (JSA)</b>	JSA No: DHUV-JSA- Revision No:												
<b>RISK RATING / RISK ASSESSMENT</b>														
<b>CONSEQUENCES</b>	<b>LIKELIHOOD</b>					<b>LIKELIHOOD RATING</b>	<b>NUMBER</b>	<b>RISK</b>						
		A	B	C	D				E	A	Almost certain	95 - 100%	1 to 3	C - Critical
	1	1	2	4	7				11	B	Likely	60 - 95%	4 to 10	H - High
	2	3	5	8	12				16	C	Possible (Moderate)	30 - 60%	11 to 15	M - Medium
	3	6	9	13	17				20	D	Unlikely	5 - 30%	16 to 25	L - Low
	4	10	14	18	21				23	E	Rare	0 - 5%		
5	15	19	22	24	25									
<b>CONSEQUENCE RATING</b>														
	<b>INJURY</b>				<b>ENVIRONMENT</b>									
1	Multiple fatalities or health effects resulting in multiple disabling illnesses				Severe long term environmental impact. Severe breach of regulations. Likely to close operations.									
2	Fatality or permanent disability or irreversible health effect				Serious medium term environmental impact. Report to regulator.									
3	LTI or severe, reversible health effect				Moderate impact. Reportable to regulator. Extends beyond site boundary.									
4	MTI or reversible health effect of concern				Minor impact at site.									
5	FAI or minor reversible effects				Limited impact. No regulatory reporting.									
<b>RISK MATRIX = COMBINES THE CONSEQUENCE WITH THE LIKELIHOOD</b>														
Critical	Do not start work. Do formal risk assessment and pull in additional control		High	Do not start work. Consult supervisor to identify the extra controls you need to introduce to reduce the risk to acceptable level		Medium	Review existing controls. Report any concerns to your supervisor. Monitor for any change in the risk.		Low	Proceed with work. Monitor for any change in the risk.				
JSA Reviewed by: <span style="float: right;">Actions to be taken: refer to the next page.</span>														



Risk Rating	Actions to be taken
Critical	Do not start work. Do formal risk assessment and put in additional control
High	Do not start work. Consult supervisor to identify the extra controls you need to introduce to reduce the risk to acceptable level
Medium	Review existing controls. Report any concerns to your supervisor. Monitor for any change in the risk
Low	Proceed with work. Monitor for any change in the risk

#### 4.5 Prevention of Public/Traffic Accidents

The construction site for the Sewage Treatment Plant and its Access Road are situated in Kila Kila district and all vehicles related to the Project used the existing road in the community as an approach road till a new Access Road was available for traffic. To prevent public/traffic accidents related to the Project, close liaison and due care for the community are required. There is also a need to ensure drivers of construction vehicles, guards and traffic guides understand the importance of Safety and take due care.

Kila Kila Elementary school is located at the entrance of the Access Road and a secondary school at the middle of the same. The same degree of Safety Management is also required when constructing the Access Road.

As of the end of December 2016, no public/traffic accidents were reported. The Study Team learned that the POMSSUP team (KCH/NJS/DH-JV) were managing such issues adequately. The Study Team also noted the following:

- Employment of community persons as guards and traffic guides to ensure traffic safety of Project-related vehicles and the safety of residents in the community.
- Rules for heavy vehicles, stating that they should move, even slowly, but not stop on the approach road to prevent children from going under them.
- Share information to prevent similar accidents which occurred outside the Project.
- Exercise maximum care to ensure safety of students (Provision of temporary school-commuting paths, installing humps to reduce the speed of vehicles passing etc.)



Crossing of the existing road

Traffic guide at the crossing

A dump truck passing the existing road



## Chapter 5 Safety Seminar

On 23 January 2017, at the meeting room of the DH-JV Project Office, a seminar was held, during which Safety Management in Japan, the Introduction of JICA Guidance and an Outline of Study Results were presented. At the beginning of the seminar, the Study Team explained the study background, whereby a safety review study was being initiated following the serious accident involving Can Tho Bridge in Vietnam in September 2007 and 13 projects in nine countries were being reviewed from 2009 to 2015. The Study Team introduced and distributed the JICA Safety Policy; publicly available in March 2015 to all attendees as handout material at the seminar.

### 5.1 Attendance

A total of 30 persons, including KCH (Employer), NJS (Engineer), DH-JV (Contractor) and Subcontractors attended.

**Table 5-1 Breakdown of Attendees**

	KCH	NJS	DH-JV	Subcontractors	JICA
Number	3	4	11	10	2
Position	Senior PM, PM, Safety Manager	3 Japanese, 1 USA	6 Japanese including PD, PM and Safety Manager	AES six persons Hebou three persons ABC one person	1 Japanese 1 Program Officer

### 5.2 Contents of Seminar

The seminar schedule is shown in Table 5-2 and implemented as scheduled.

**Table 5-2 Seminar Schedule**

Time	Item	Person in charge
13:30	Opening/reception	Study Team
14:05	Background of safety review, Section 1 History of Accidents prevention in construction industry in Japan	Study Team Leader
14:25	Section 2 JICA ODA Introduction of JICA Safety Policy and JICA Guidance Comparison of Safety Plan and that in JICA Guidance	
14:40	Opening Address	Senior PM of KCH
14:45	Break	
15:00	Section 3 Outline of Study Result	Study Team Leader
15:40	Q&A	Study Team
15:45	Closing Address	Senior PM of KCH
15:50	Closing	

The seminar included the following three sections.

Section 1: History of accident-prevention in the construction industry in Japan

Section 2: Introduction of JICA Safety Policy, JICA Guidance, a Comparison of Safety Plan and that in JICA Guidance

Section 3: Outline of Study Results, Observations and Recommendations

A copy of seminar slides is attached in Appendix-4.

#### 5.2.1 Section 1: History of Accident-prevention in the Construction Industry in Japan

The first section is a history of accident-prevention in the construction industry in Japan, in which safety was initially imposed by law and penalty-driven and later transformed to self-discipline by stakeholders and a culture of safety-driven as the society in Japan matured.

##### 5.2.1.1 Occurrence Record of Occupational Injuries Graph Showing Fatalities and Casualties, Absences from Work of at Least 4 Days for All Industries and the Construction Industry)

There were 972 fatalities for all industries in 2015, which is the first time that fewer than 1000 fatalities were recorded since statistics started in 1953. Over a decade or so since enacting the Industrial Safety and Health Act in 1972, the number of fatalities and casualties declined significantly for all industries and the Construction Industry.

##### 5.2.1.2 Ministries Responsible for Construction Safety

Roles of Ministry of Land, Infrastructure, Transport and Tourism (MLIT) and Ministry of Health, Labour and Welfare (MHLW) which corresponds to DOLIR were introduced.

##### 5.2.1.3 Framework for Construction Safety and Health

The framework comprises legal restraints under the Industrial Safety and Health Act enacted in 1972; its Order, Ordinance and workplace inspection by the Labour Standards Inspection Bureau and suspension of qualification of contractors involved in serious occupational accidents.

##### 5.2.1.4 Typical Daily Construction Cycle

The typical Daily Construction Cycle in Japan was introduced, namely radio exercises, morning gathering, Toolbox Meeting, Hazard Prediction Training, Pre-start check, walkthrough by the PM, Daily Safety Interface Meeting (DSIM), Site Clean-up etc.

##### 5.2.1.5 Safety Management System in Japan

In 1999, OHSAS 18001 was established in England. At around the same time, MHLW in Japan established Guidelines on the Occupational Safety and Health Management System (OSHMS). Based on these guidelines, the Japan Construction Safety and Health Association (JCOSHA) made Guidelines on the Construction Occupational Health and Safety Management System (COHSMS). In 2006, the Industrial Safety and Health Act was amended to include a Risk

Assessment as a “make efforts” obligation and the above guidelines were also amended.

#### 5.2.1.6 Culture of Safety at the web of MHLW

In the web, MHLW introduced Safety Culture as “a corporate culture” to prioritise the Safety and Health of employees by mitigating risks in facilities and works through risk assessments and providing safety education and training throughout the employment period. MHLW tried to promote and disseminate Safety Culture through the 10<sup>th</sup> Occupational Accident Prevention Plan (FY2003-FY2007) and the 11<sup>th</sup> Occupational Accident Prevention Plan (FY2008-FY2012)

#### 5.2.1.7 Example of Japanese Culture of Safety Construction Company for a Plant)

To eliminate accidents, the company tries to reduce “Unsafe conduct” of workers, which was the direct cause of more than 90% of accidents. The following two approaches were made:

- Management not to trigger “Unsafe Conduct” (Technical base)
- Safety achieved by workers “thinking and acting” of themselves. (Conduct base)

#### 5.2.1.8 Management not to Trigger “Unsafe Conduct”

The Operators of the Safety Management System(SMS) consider that there will be defects in SMS when a worker engages in “Unsafe Conduct”; examining from the perspective of what makes him/her do so and improving SMS by eliminating the cause of the defect. SMS is to be operated by the Safety-First principle.

#### 5.2.1.9 Boosting the Safety Culture by Continual Improvement

The company tried to boost the Safety Culture through Continual Improvement of SMS under commitment of Top Management, Felt leadership of Managers and based on the following objectives of all employees:

- To conduct a common concept of values whereby safety is the top priority
- To obey rules decided on and ensure safe conduct, even if nobody is monitoring
- To care for fellow workers and naturally be careful about each other

#### 5.2.2 Section 2: Introduction of JICA Safety Policy, Guidance and a Comparison of Safety Plan and that in JICA Guidance

JICA Safety Policy and JICA Guidance were introduced. With respect to JICA Guidance, because the table of contents of JICA Guidance was included in handouts, corresponding slides were deleted. And also, time was spent for a comparison of Safety Plan and that in JICA Guidance because an amendment of Safety Plan would be recommended.

##### 5.2.2.1 Introduction of JICA Web, Safety for Construction Works in Japanese ODA Projects

The JICA web, including a download link to the JICA Safety Policy and JICA Guidance, was introduced.

#### 5.2.2.2 JICA Safety Policy

The Basic Concept and Basic Policy (1) Promoting Safety First and (2) Promoting the Japanese Safety Culture were explained.

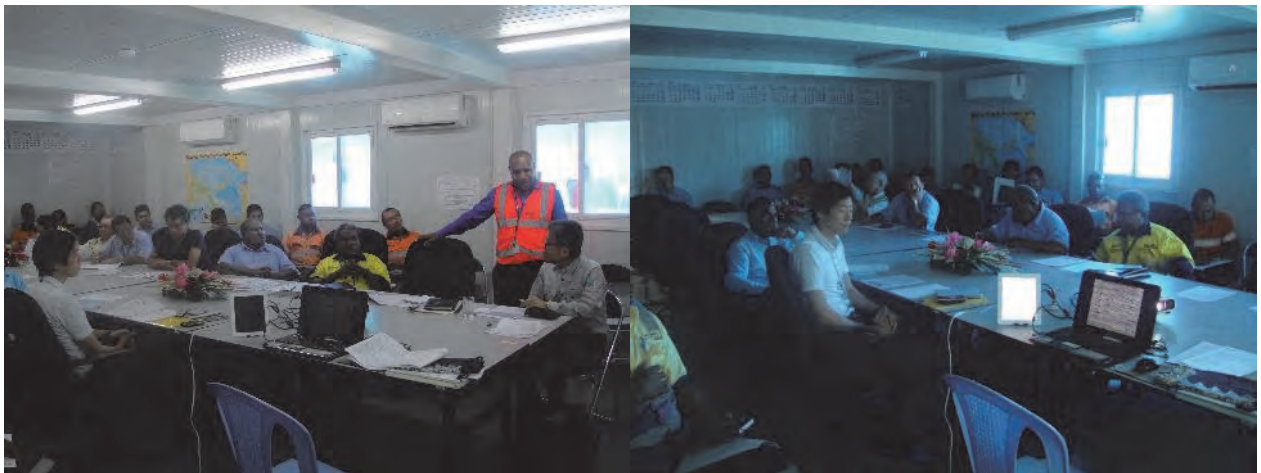
#### 5.2.2.3 Comparison of Safety Plan and that in JICA Guidance

Details are explained in Sub-Clause 3.4.3 of this Report.

#### 5.2.3 Section 3: Outline of Study Results

After a short break, Section 3 was presented, the contents of which are described in Chapter 3, Chapter 4 and Chapter 6 of this Report.

The Senior PM of KCH agreed to the Study Team's request to make opening and closing addresses. During these, the Senior PM emphasised that efforts of all parties involved were required to continue and improve the existing Safety Management System and that the Project should be completed without any Accidents.



**Figure 5-1 Seminar Audience**

5.2.4 Q & A in the Seminar

Contents of the Q&A are shown in Table 5-3.

**Table 5-3 Q & A in the Seminar**

Question	Answer
<p>Although we respected that no injury absence from work not less than 1 day was zero, how about near miss? (Question by KCH during pre-briefing of Outline of results in the morning on 23 January)</p>	<p>DH-JV: Near miss was not collected. (recorded)</p>
<p>Study Team: How to collect near miss? Near miss is to be reported by a worker etc. who encountered such situations.</p>	<p>KCH: Because Accident/Incident Reports were submitted even for small incident, such number is to be included into safety statistics which are submitted to Monthly Safety Committee Meeting.</p> <p>NJS: In the past contract, near miss was collected using questionnaire to staff and workers including subcontractors. The same method might be adopted.</p> <p>Study Team: DH-JV was requested to study collection method of near miss and how to utilise it for Safety Management.</p>

## **Chapter 6 Recommendations**

### **6.1 Recommendations to KCH/NJS/DH-JV**

The Study Team recognised that KCH/NJS/DH-JV have been working in close cooperation with respect to Safety Management activities and obtained good results in terms of no occupational accidents/public accidents.

The Study Team did not identify items for recommendation regarding current activities on site. However, to further boost the current Safety Management, the following two items are recommended:

- Establishing a near miss-collection system to prevent Accidents
- Eliminating differences between the Safety Plan (Plan) and activities on site (Do)

#### **6.1.1 Establishment of a Near miss-collection System to Prevent Accidents**

To utilise near miss events to prevent Accidents, it is recommended to establish a near miss-collection system by DH-JV; supported/assisted by KCH/NJS.

To collect near miss events, it is important that the site staff of KCH, including the Safety Manager, NJS site staff, DH-JV site staff, including the Safety Manager and staff, foremen and workers of subcontractors, including Safety Officers, all improve their awareness of near miss events. Despite the absence of accidents to date, in theory, experiencing no near misses is almost impossible. Sharing near miss events which eventually did not induce accidents, with staff and fellow workers is in line with Safety and Environment Policy of DH-JV in which all employees of DH-JV have the responsibility to protect his/her health and safety and the health and safety of other workers by working in compliance with legislation and established workplace practices and procedures. By collecting and analysing causes of near miss events, more effective means of preventing accidents could be developed and compiled.

Collecting the near miss events on site depends on reporting by persons having experienced or witnessed near misses. As a first step, it is proposed that a reporting form be prepared and whenever KCH/NJS/DH-JV staff experience or witness near misses, they should record the details on the form and send it to the DH-JV Safety Manager.

### **6.2 Recommendation to the Contractor(DH-JV)**

#### **6.2.1 Amendments to the Health and Safety Management Plan (Safety Plan)**

At the time of the Safety Review on site, the Health and Safety Management Plan Version B, dated 23 June 2016, was valid. This version was compiled before construction commenced and did not include all Safety Management Activities currently carried out on site. Therefore, amendments to Safety Plan are recommended to eliminate differences between the Safety Plan (Plan) and activities on site (Do).

Items requiring amendment and identified during the Site Review are shown in Table 6-1 as a reference.

**Table 6-1 Items to be amended in the Safety Plan**

Category	Contents
Activities not clearly included in Safety Plan	This Report Sub-Clause 3.5.2.5 Monthly Safety Committee Meeting Sub-Clause 3.5.2.6 Joint Safety Inspection Sub-Clause 3.5.2.7 Daily Work and Safety Meeting Sub-Clause 4.1 Monthly Gathering including education and training
An improvement is required in items described in Safety Plan	Safety Plan Sub-Clause 5.2 Contractual Health and Safety Requirement Sub-Clause 9.3.2 Safety Notice Board Sub-Clause 9.3.3 and Attachment 5 Site Layout Plan Attachment 7 Incident/Accident Reporting Structure Attachment 10 Job Safety Analysis(JSA) Form Other items
Reconsideration is required in items included in Safety Plan	Safety Plan Attachment 4 Training Matrix Attachment 6 Daily Pre-Start Meeting Form Attachment 9 Safe Work Method Statement Form Other items

When a near miss-collection system is established, it is to be included in the amended Safety Plan.

## Appendices

Appendix-1 : Safety Policy for Construction Works in Japanese ODA Projects ..... App-1

Appendix-2 : Hearing memo

2-1: DOLIR: Department of Labour and Industrial Relations ..... App-3

Appendix-3 : Site Organization Chart

3-1: Kumul Consolidated Holdings (KCH)..... App-5

3-2: NJS Consultants Co., Ltd. (NJS) ..... App-6

3-3: Dai Nippon Construction and Hitachi Ltd. JV (DH-JV) ..... App-7

Appendix-4 : Seminar Slides..... App-8

4-1: Section 1: ..... App-9

History of Accidents prevention in construction industry in Japan

4-2: Section 2: ..... App-12

Introduction of JICA Safety Policy, JICA Guidance and  
Comparison of Safety Plan to that in JICA Guidance

4-3: Section 3: ..... App-13

Outline of Study Results, Observations and Recommendations



## **Appendix-1**

### Safety Policy for Construction Works in Japanese ODA Projects

#### 1. Basic Concept

The highest priority must be placed on ensuring safety and protecting human life in construction works of Japanese ODA projects. As an organization that supports economic and social development in developing countries, Japan International Cooperation Agency (hereinafter referred to as JICA) is expected to ensure high safety standards on its construction sites. JICA is determined to improve prevention measures and reduce occupational accidents, with the aim of eventually eradicating all preventable accidents.

JICA recognizes its role in disseminating "the Japanese culture of safety" to all organizations and individuals engaged in Japanese ODA construction projects.

#### 2. Basic Policy

##### (1) Promoting the highest priority on safety for all construction works

JICA will further promote maximum safety measures for prevention of occupational accidents. This will ensure that all parties in construction works prioritize safety and protecting human life, in compliance with the following basic policy for safety management.

#### **Basic Policy for safety management**

- Full implementation of measures to eliminate causes of accidents
- Full implementation of measures to prevent accidents
- Compliance with the related rules and regulation applied to Japanese ODA projects
- Full implementation of measures to prevent public accidents
- Full implementation of PDCA (Plan, Do, Check, Act) cycle of safety management
- Information sharing with all parties
- Ensuring participation of all relevant parties in construction safety measures

In order to ensure safety in construction works, JICA formulated "The Guidance for the Management of Safety for Construction Works in Japanese ODA Projects." JICA is determined to improve the implementation of safety measures in compliance with the Guidance. JICA is also determined to promote the full implementation of safety measures through site visits by JICA experts and missions.

(2) Promoting "the Japanese culture of safety"

JICA will promote the dissemination of our experience in construction safety, which can be branded as "the Japanese culture of safety" in cooperation with employers, consultants and contractors.

- JICA will promote efforts to establish mechanisms of self-sustained and proactive occupational safety measures in relevant organizations, such as executing agencies, and will raise awareness on safety measures in developing countries.
- JICA will promote understanding among all parties in developing countries on the importance of prioritizing safety and protecting human life. We will also stress the need to invest in adequate safety management measures and highlight that by conducting appropriate safety management, efficiency, productivity and quality can be enhanced.

In order to disseminate "the Japanese culture of safety," JICA will support developing countries' safety management capacity development through ODA projects, including construction works and technical cooperation.

The Safety Policy for Construction Works in Japanese ODA Projects will be communicated to all employees and personnel who work for or on the behalf of JICA. It will also be made available to the wider public.

30th March, 2015

*Original Signed by Mr. Akihiko TANAKA*

President

Japan International Cooperation Agency

**Appendix-2 Hearing Memo**

**5-1: Department of Labour and Industrial Relations (DOLIR)**

Date/Time: 14:00-15:00 on 16 January 2017 Venue: Department of Labour and Industrial Relation Occupational Safety & Health Program Office
Attendees: Department of Labour and Industrial Relation (DOLIR): Mr. DONALD LUNEN (Executive Manager, Occupational Safety & Health Program) Mr. LAMA MAILA (OSH Inspector) JICA PNG Office: Mr. THOMAS SAMSON (Program Officer) Study Team: Mr. Mitani and Mr. Ikenaga
Subject: Construction Safety & Health
<ol style="list-style-type: none"><li>1. Occupational Safety and Health(OSH) of DOLIR is responsible for enforcement of the following 4 Acts.<ol style="list-style-type: none"><li>1- Industrial Safety, Health and Welfare Act (ISHW Act)</li><li>2- Inflammable Liquid Act including Dangerous goods</li><li>3- Explosives Act</li><li>4- Trade Licensing Act (Worker's qualification as a trade)</li></ol></li><li>2. The above Laws and related regulations are valid in January 2017, DOLIR recognises that they were out of date and not suitable for modernized Industries. A new Act will be enacted within Year 2017, which will be called as "Occupational" Safety and Health Act.</li><li>3. The existing Laws and Regulations can be found in PACLII (Pacific Islands Legal Information Institute) database available on the web. New amendments are also included. <a href="http://www.pacii.org/countries/pg.html">http://www.pacii.org/countries/pg.html</a></li><li>4. As a reference, a soft copy of the existing Laws and Regulations in 2015 was received. OSH Inspector promised Study Team that he would extract necessary provisions which are applicable to construction sites. (Study Team received his memo in the afternoon on 18 January 2017.)</li><li>5. Trade Licences to individuals are issued by DOLIR. (Executive Manager is a signer of Trade Licence) Trade Licences are required for trades which are specified as Prescribed Trade in</li></ol>

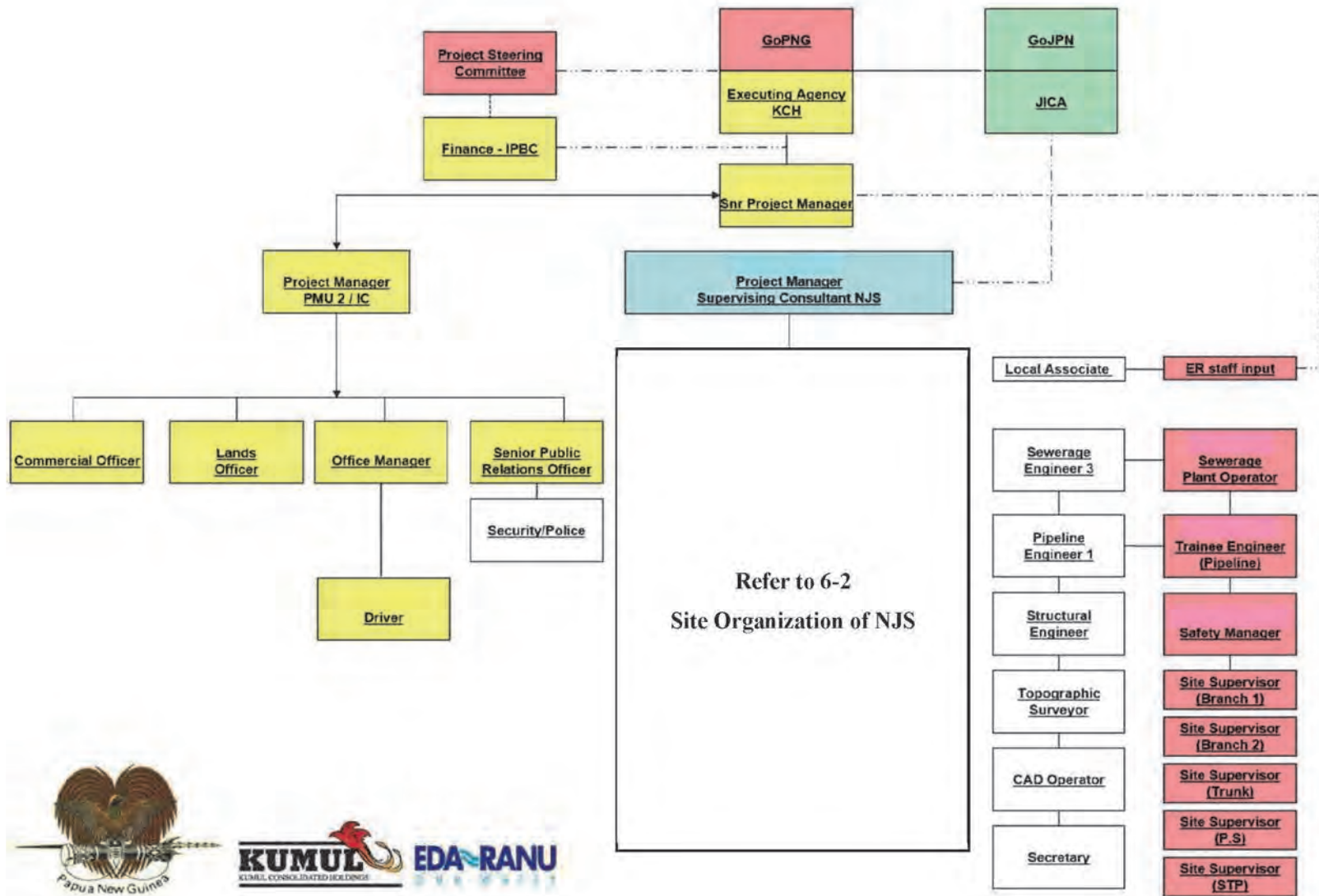
Trade Licensing Act and stated in Trade Licensing Regulation.

Plumber, Gas fitter, Welder, Steam Boiler Attending etc.

6. ISHW Act specified a Factory Inspection by DOLIR. Construction sites are also included in the definition of Factory and Inspection can be carried out. Total 11 OSH Inspectors were on duty for all PNG and for all Industries.
7. DOLIR is also responsible for enforcement of Industrial Safety Orders. Regarding the mine, Mining (Safety) Act were enacted in 1977 and where Mining (Safety) Act is applied, ISHW Act is not applied.
8. DOLIR has National Training Council (NTC) which accredits private education and training organizations. A person who attends a training course organized by an accredited private education and training organization becomes a qualification holder.

\*\*\*End of memo\*\*\*

Appendix-3 Site Organization Chart  
 3-1 : Kumul Consolidated Holdings (KCH)



App-5





### 3-2 : NJS Consultants Co., Ltd. (NJS)

Port Moresby Sewerage System Upgrading Project (POMSSUP)  
 Contract No. POMSSUP-01/JICA Loan No. PN-P9

The Engineer's Assignment and Delegation Rev. 1 Dated 15th August 2018

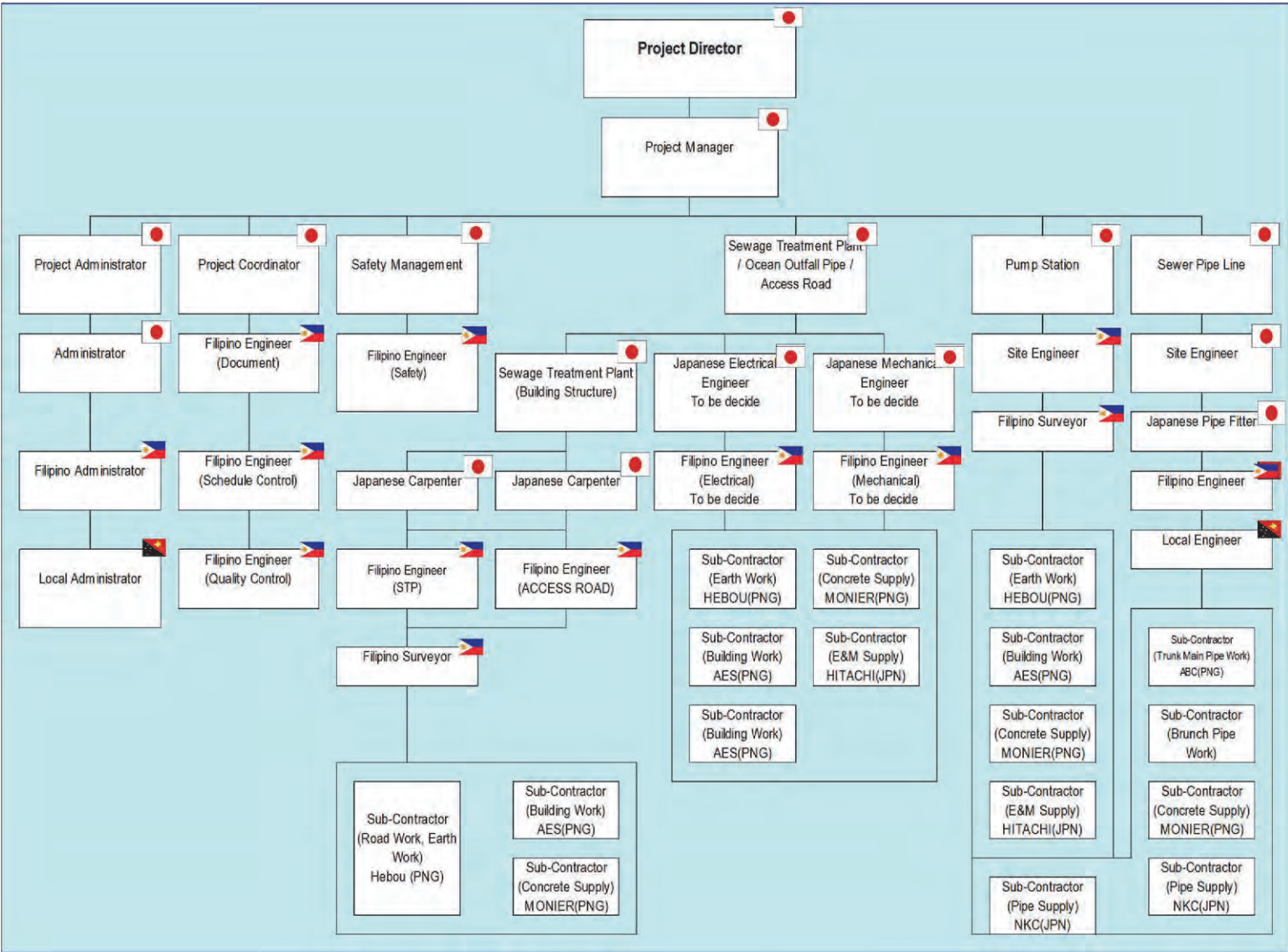
### Matrix for authorities under Construction Contract (to Sub-Clause 20.6 Arbitration) and position assigned

Sub-Clause of General Conditions of Contract	Authority	Representative	Resident Engr	Civil Engr	Sewerage Engr	Pipeline Engr	Elec. Engr	Elec/Data Engr	Mech. Engr	SD Expert	Water Q. Expert	STP Expert
1.9 (Delayed Drawings or Instructions)	Determination	Any Matter	No	No	No	No	No	No	No	No	No	No
2.1 (Right of Access to the Site)	Determination	Any Matter	No	No	No	No	No	No	No	No	No	No
2.5 (Employer's Claim)	Determination	Any Matter	No	No	No	No	No	No	No	No	No	No
3.3 (Instructions of Engineer)	Instruction	Any Matter	Any Matter	Access/Prep	STP Exc. Prep	PS & Pipeline	Electrical	Electrical	Mechanical	HIV/AIDS	Operational	Operational
3.5 (Determination)	Determination	Any Matter	No	No	No	No	No	No	No	No	No	No
4.1 (Contractor's General Obligations)	Request	Any Matter	Any Matter	Access/Prep	STP Exc. Prep	PS & Pipeline	Electrical	Electrical	Mechanical	HIV/AIDS	Operational	Operational
4.3 (Contractor's Representative)	Consent	Any Matter	No	No	No	No	No	No	No	No	No	No
4.4 (Subcontractor/Supplier)	Consent	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
4.7 (Setting Out)	Notice	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
4.9 (Quality Assurance)	Audit	Any Matter	Any Matter	Access/Prep	STP & PS	Pipeline	Electrical	Electrical	Mechanical	HIV/AIDS	Operational	Operational
4.12 (Unforeseeable Physical Conditions)	Inspect/Investig	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
4.17 (Contractor's Equipment)	Consent	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
4.19 (Electricity, Water and Gas)	Determination	Any Matter	No	No	No	No	No	No	No	No	No	No
4.20 (Employer's Equipment)	Determination	Any Matter	No	No	No	No	No	No	No	No	No	No
4.22 (Security on Site)	Notice	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
4.23 (Contractor's Operation on Site)	Access	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
4.24 (Fossils)	Instruction	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
5.1 (Definition of Nominated Subcon)	Instruction	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
5.3 (Payment to Nominated Subcon)	Certification	Any Matter	No	No	No	No	No	No	No	No	No	No
5.4 (Evidence of Payment)	Request	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
6.6 (Working Hours)	Consent	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
6.7 (Health and Safety)	Review/Check	Any Matter	Any Matter	Access/Prep	STP Exc. Prep	PS & Pipeline	Electrical	Electrical	Mechanical	HIV/AIDS	Operational	Operational
6.9 (Contractor's Personnel)	Request	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
6.10 (Record of Contractor's Personnel and Equipment)	Approval	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
6.22 (Employment Records of Workers)	Audit	Any Matter	Any Matter	Access/Prep	STP Exc. Prep	PS & Pipeline	Electrical	Electrical	Mechanical	HIV/AIDS	Operational	Operational
7.2 (Samples)	Consent	Any Matter	Any Matter	Access/Prep	STP Exc. Prep	PS & Pipeline	Electrical	Electrical	Mechanical	HIV/AIDS	Operational	Operational
7.3 (Inspection)	Inspection	Any Matter	Any Matter	Access/Prep	STP Exc. Prep	PS & Pipeline	Electrical	Electrical	Mechanical	HIV/AIDS	Operational	Operational
7.4 (Testing)	Witness	Any Matter	Any Matter	Access/Prep	STP Exc. Prep	PS & Pipeline	Electrical	Electrical	Mechanical	HIV/AIDS	Operational	Operational
	Notice	Any Matter	Any Matter	Access/Prep	STP Exc. Prep	PS & Pipeline	Electrical	Electrical	Mechanical	HIV/AIDS	Operational	Operational
	Certification	Any Matter	Any Matter	Access/Prep	STP Exc. Prep	PS & Pipeline	Electrical	Electrical	Mechanical	HIV/AIDS	Operational	Operational
7.5 (Rejection)	Notification	Any Matter	Any Matter	Access/Prep	STP Exc. Prep	PS & Pipeline	Electrical	Electrical	Mechanical	HIV/AIDS	Operational	Operational
	Instruction	Any Matter	Any Matter	Access/Prep	STP Exc. Prep	PS & Pipeline	Electrical	Electrical	Mechanical	HIV/AIDS	Operational	Operational
7.6 (remedial Work)	Instruction	Any Matter	Any Matter	Access/Prep	STP Exc. Prep	PS & Pipeline	Electrical	Electrical	Mechanical	HIV/AIDS	Operational	Operational
8.1 (Commencement of Works)	Instruction	Any Matter	No	No	No	No	No	No	No	No	No	No
8.3 (Programme)	Notice	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
	Request	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
8.4 (Extension of Time for Completion)	Determination	Any Matter	No	No	No	No	No	No	No	No	No	No
8.5 (Delays Caused by Authorities)	Determination	Any Matter	No	No	No	No	No	No	No	No	No	No
8.6 (Rate of Progress)	Instruction	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
	Notification	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
8.8 (Suspension of Work)	Instruction	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
	Notification	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
8.9 (Consequences of Suspension)	Determination	Any Matter	No	No	No	No	No	No	No	No	No	No
8.11 (Prolonged Suspension)	Permission	Any Matter	No	No	No	No	No	No	No	No	No	No
8.12 (Resumption of Work)	Examination	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
	Instruction	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
9.1 (Contractor's Obligation)	Instruction	Any Matter	Any Matter	Access/Prep	STP Exc. Prep	PS & Pipeline	Electrical	Electrical	Mechanical	HIV/AIDS	Operational	Operational
9.4 (Failure to Pass Test on Completion)	Determination	Any Matter	No	No	No	No	No	No	No	No	No	No
10.1 (Taking Over of the Works and Sections)	Certification	Any Matter	No	No	No	No	No	No	No	No	No	No
10.2 (Taking Over of Parts of the Works)	Certification	Any Matter	No	No	No	No	No	No	No	No	No	No
10.3 (Interference with Tests on Completion)	Determination	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
	Notification	Any Matter	Any Matter	No	No	No	No	No	No	No	No	No
11.1 (Completion of Outstanding Work and Remedying)	Notification	Any Matter	Any Matter	Access/Prep	STP Exc. Prep	PS & Pipeline	Electrical	Electrical	Mechanical	HIV/AIDS	Operational	Operational
11.4 (Failure to Remedy Defects)	Determination	Any Matter	No	No	No	No	No	No	No	No	No	No
11.6 (Further Tests)	Request	Any Matter	Any Matter	Access/Prep	STP Exc. Prep	PS & Pipeline	Electrical	Electrical	Mechanical	HIV/AIDS	Operational	Operational
11.8 (Contractor to Search)	Request	Any Matter	Any Matter	Access/Prep	STP Exc. Prep	PS & Pipeline	Electrical	Electrical	Mechanical	HIV/AIDS	Operational	Operational
11.9 (Performance Certificate)	Certification	Any Matter	No	No	No	No	No	No	No	No	No	No
12.1 (Works to be Measured)	Notification	Any Matter	Any Matter	Access/Prep	STP Exc. Prep	PS & Pipeline	Electrical	Electrical	Mechanical	HIV/AIDS	Operational	Operational

### Matrix for Work Items/Section and Position

Demarcation of Work Item	Section	Work Item	Civil Engr	Sewerage Engr	Pipeline Engr	Elec. Engr	Elec/Data Engr	Mech. Engr
	Access Road	Cutting	Yes					
		Filling	Yes					
		Protection wall	Yes					
		Road Drainage	Yes					
		Paving/Curb Stone	Yes					
		Marking	Yes					
		Wall Protection	Yes					
		Trunk Pipeline			Yes			
		Water Pipeline			Yes			
		STP	Cutting	Yes				
	Filling		Yes					
	Protection wall		Yes					
	In-yard Road/Marking		Yes					
	In-yard Drainage		Yes					
	Concrete Structure			Yes				
	Building			Yes				
	Excavation			Yes				
	Back Filling			Yes				
	In-yard Piping			Yes				
	PS & Pipeline	In-yard/Building Mechanical						Yes
		In-yard/Building Electrical						Yes
		Ocean Outfall/Green Walkway	Yes			Yes	Yes	
		Boundary Fence/Landscaping	Yes					
		Excavation			Yes			
		Pipe Trench			Yes			
		Manhole/Valve box			Yes			
		Pipeline Weld/Install			Yes			
		Pipeline Test/Cleaning			Yes			
		PS Structure			Yes			
	PS Building			Yes				
	PS/Building Mechanical			Yes			Yes	
	PS/Building Electrical			Yes	Yes	Yes		
	PS Fence/Landscaping	Yes		Yes				







**Appendix-4 : Seminar Slides**

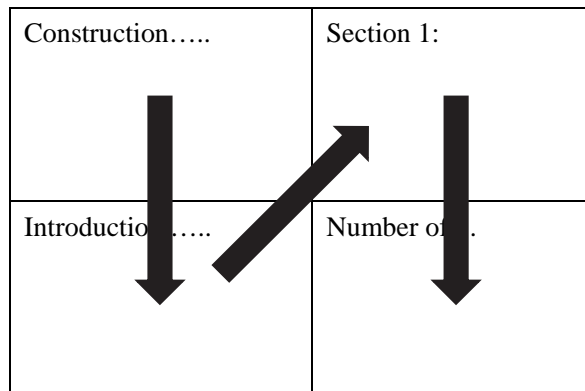
4-1: Section 1: History of Accidents prevention in construction industry in Japan

4-2: Section 2: Introduction of JICA Safety Policy, JICA Guidance and Comparison of Safety

Plan to that in JICA Guidance

4-3: Section 3: Outline of Study Results, Observations and Recommendations

Sequence of Slides



## Construction Safety and Health Seminar

Project Name	CONSTRUCTION OF PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT	
Facility	Access Road to STP Road Width - 8m. Total Road Length = 1,250m	
Financier	  Japan International Cooperation Agency Loan No. PN-P9	
Employer	  KUMUL CONSOLIDATED HOLDINGS Operator : EDA RANU	
Engineer	 NJS CONSULTANTS CO., LTD.	
Contractor	  DAI NIPPON-HITACHI JV	

From 14:00 to 16:00 on 23 January 2017

JICA Study Team for Safety Review Study 2016   International Project Management Services  
株式会社エンジニアリングインターナショナル  
KATAHIRA & ENGINEERS INTERNATIONAL

App-9

## Introduction- Study Background

- In September 2007, The Can Tho Bridge Accident occurred in Vietnam.
- The committee deployed by Ministry of Foreign Affairs Japan, made a recommendation to JICA for carrying out Safety Review by third party consultant, to prevent re-occurrence of the similar Accident.

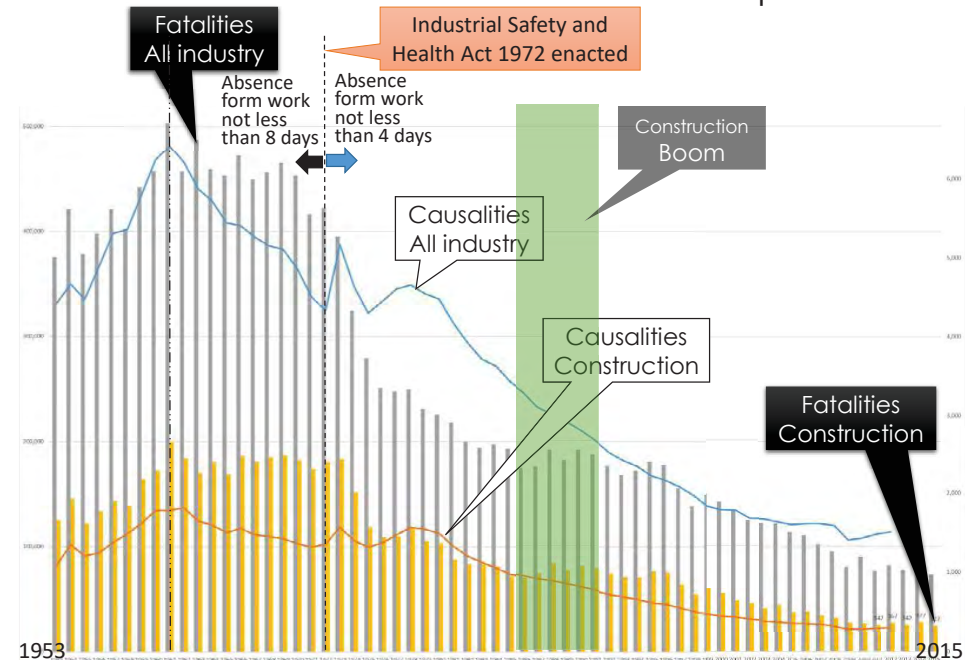
➔ As recommended by the committee, JICA has initiated Safety Reviews in respect of 13 on-going projects since 2009. Projects in Turkey, Uzbekistan, Vietnam, Philippines, Sri Lanka, Malaysia, Indonesia, India and Kenya were reviewed.



## Section 1:

History of Industrial Safety and Health in Japan and, an example of Japanese culture of Safety

Number of Causalities and Fatalities in Japan



## Ministries in charge of Construction Safety & Health

**Ministry of Land, Infrastructure, Transport and Tourism (MLIT)**

- Setting up frameworks for bidding/contract procedures
- Holding certification examinations such as technic for management of civil engineering works
- Drawing up standards for construction or civil engineering works cost estimation

**Ministry of Health, Labour and Welfare (MHLW)**

Labour Standards Bureau

**Labour Standards Inspection Bureau**

2,400 Inspectors

Kanto RB	Tohoku RB
Hokuriku RB	Chubu RB
Kinki RB	Chugoku RB
Shikoku RB	Kyushu RB

- Procurement of public works
- Supervision/inspection/performance evaluation of public works



Prefectural Labour Bureau

Total 47 Prefectural LB

Hokkaido LB	Aomori LB
Akita LB	Iwate
...	...
Miyazaki LB	Kumamoto LB
Kagoshima LB	Okinawa LB

Corporation established by special Law  
 > Japan Industrial Safety & Health Association  
 > **Japan Construction Occupational Safety & Health Association**

App-10

## Features of Safety Management Framework in JAPAN

Law

Industrial Safety and Health Act (No.57 of 1972)  
 Order for enforcement of Industrial Safety and Health Act  
 Ordinance on Industrial Safety and Health (Ordinance)  
 >>>Very strict law with detailed enforcement regulations, rules.

Inspection

Strict Inspection System for Workplaces

>>>by the Labour Standards Inspectors authorized with judicial and police powers.

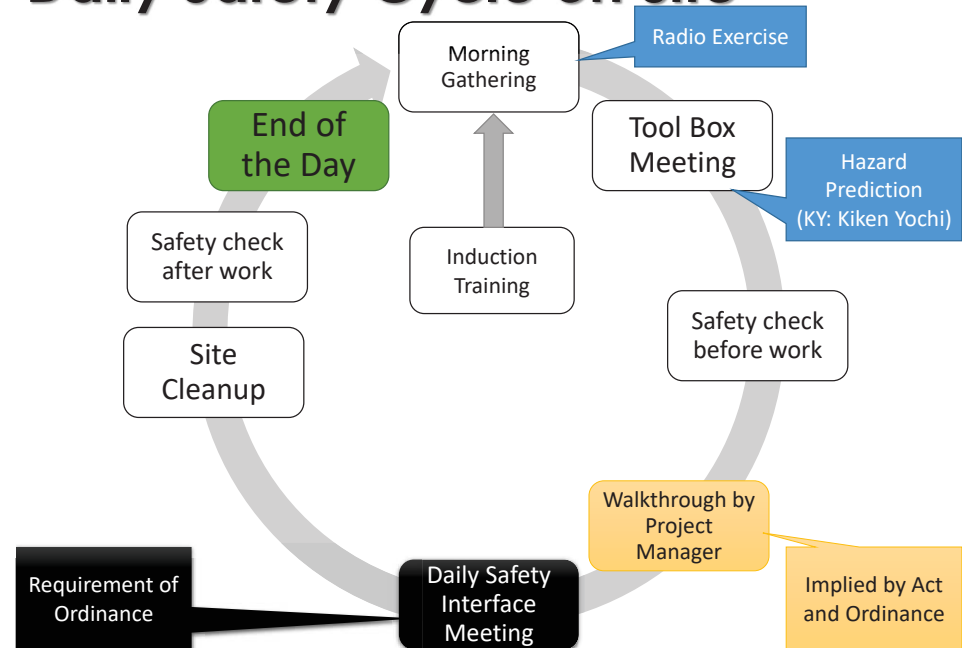
**Penalty**

Suspension of Bidding Qualification for Contractors

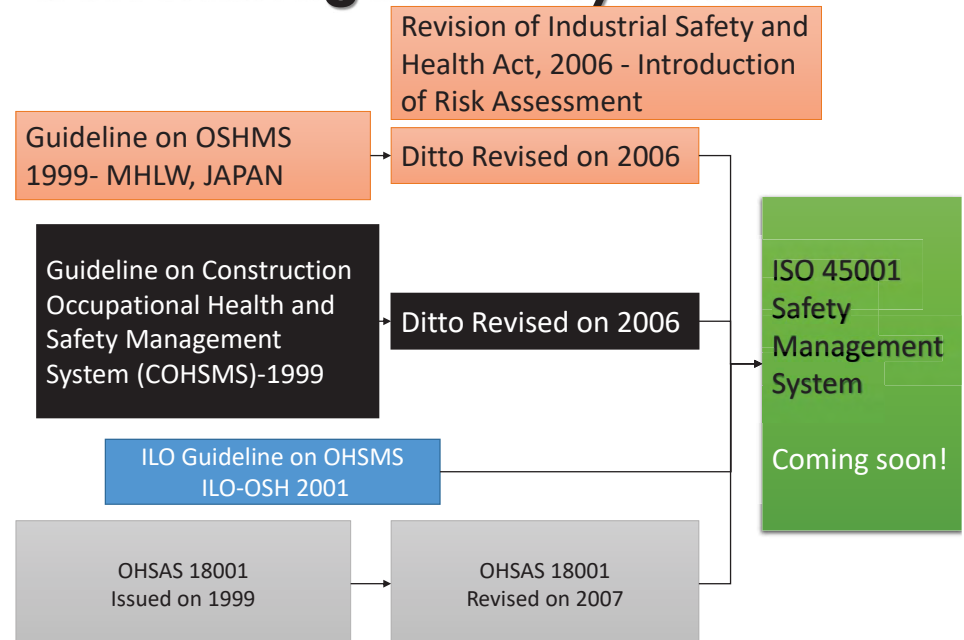
>>>Restriction for next bidding opportunity if one contractor caused a fatal accident/serious accident. Suspension continues maximum several months.

At the very beginning, Safety was Forced by Laws and Penalty-Driven

## Daily Safety Cycle on Site



## OSH Management System



## Culture of Safety from MHLW website

**Safety Culture:** a corporate culture to prioritize Safety and Health of employees by mitigating risks in facilities and works through risk assessment and by providing safety education and training throughout employment period.

### Dissemination of Culture of Safety:

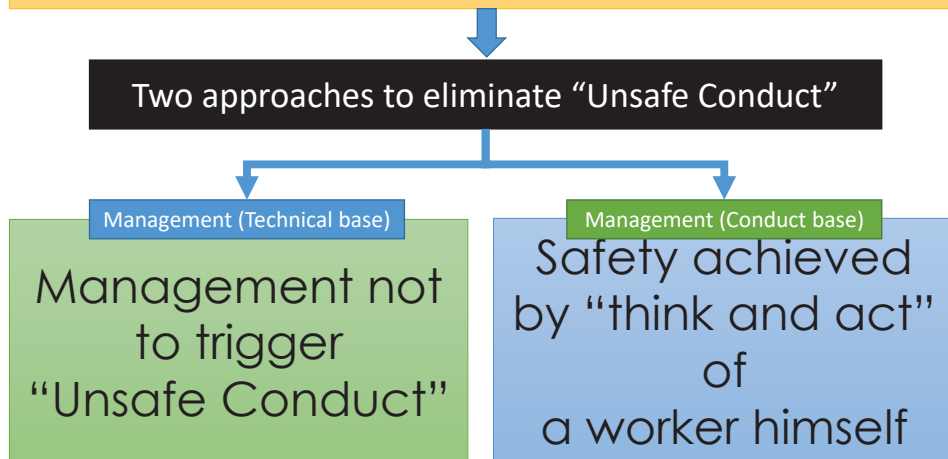
In 10<sup>th</sup> Occupational Accident Prevention Plan (FY2003-FY2007)  
 (3) Basic Policy of Plan includes  
 (iv) Dissemination of Safety management method which mitigates risks.  
 "...Ensuring Safety and Health of employees are one of the prioritized items. It is necessary to ingrain Culture of Safety in which employees and organization put highest priority on Safety and establish a system to promote Safety and Health autonomously. ..."

In 11<sup>th</sup> Occupational Accident Prevention Plan (FY2008-FY2012)  
 (III) Improve environment for promoting autonomous Safety activities  
 (iii) Promotion of improvement of corporate environment for prioritizing Safety and Health  
 "Disseminate Culture of Safety to whole company including top management."

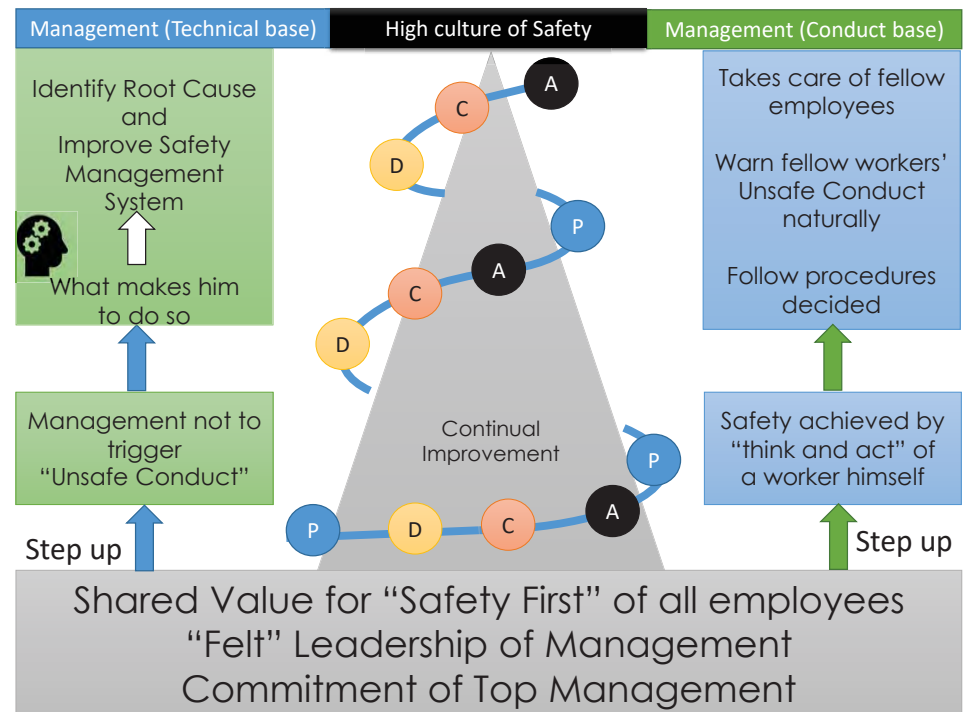
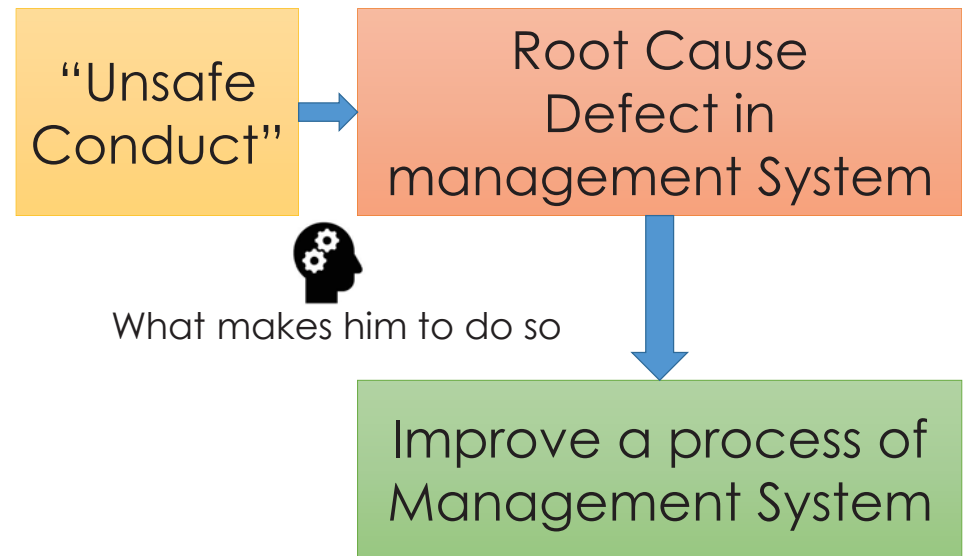
App-11

## An example of Japanese culture of Safety - A construction company

Issues: "Unsafe conduct" of a worker was a direct cause of more than 90% of Accidents.

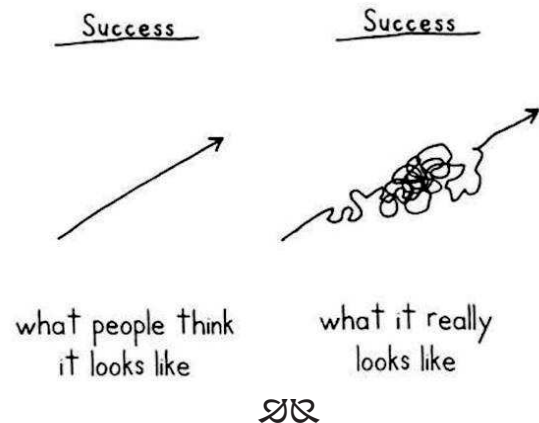


## Management not to trigger "Unsafe Conduct"





# From Forced by Laws and Penalty-Driven To **Self-discipline by stakeholders and “culture of safety”-Driven**



## Section 2: Introduction of JICA Safety Policy and Guidance

### Safety for Construction Works in Japanese ODA Projects

#### 1. Safety Policy for Construction Works in Japanese ODA Projects

JICA formulated "Safety Policy for Construction Works in Japanese ODA Projects" in order to promote safety and protecting human life in construction works.

- [Safety Policy for Construction Works in Japanese ODA Projects \(PDF/53.2KB\)](#)

#### 2. The Guidance for the Management of Safety for Construction Works in Japanese ODA Projects

JICA formulated "The Guidance for the Management of Safety for Construction Works in Japanese ODA Projects" which compiles basic principles and technical measures on the management of safety for construction works in order to prevent and reduce occupational accidents on ODA construction works. The Guidance apply to works for public and other facilities to be constructed with Technical Cooperation, ODA loan (project type) and Grant Aid which JICA implements.

- [The Guidance for the Management of Safety for Construction Works in Japanese ODA Projects \(English\) \(PDF/261KB\)](#)
- [The Guidance for the Management of Safety for Construction Works in Japanese ODA Projects \(French\) \(PDF/1.00MB\)](#)
- [The Guidance for the Management of Safety for Construction Works in Japanese ODA Projects \(Spanish\) \(PDF/969KB\)](#)

## Safety Policy for Construction Works in Japanese ODA Projects (JICA Safety Policy)

**Top Priority** → Ensuring Safety and Protecting human life

JICA ensures

- ◆ high safety standard
- ◆ Improvement of accident prevention measures
- ◆ Dissemination of **the Japanese culture of Safety** to all stakeholders

### Basic Policy

#### (1) Promoting highest Priority on Safety

- ◆ Measures to eliminate cause of Accidents---Corrective Action
- ◆ Measures to prevent Accidents---Preventive Action by risk assessment
- ◆ ...
- ◆ Information Sharing with all parties
- ◆ Ensuring participation of all relevant parties in construction safety measures

#### (2) Promoting Japanese culture of Safety

- ◆ JICA makes efforts to establish **Mechanism of Self-sustained and proactive safety measures** in relevant organizations and will raise awareness on safety measures
- ◆ JICA promotes understanding on importance of placing top priority on safety and protecting human life.
- ◆ **JICA stresses need to invest in adequate safety management measures in order to obtain enhancement of efficiency, productivity and quality by doing so.**
- ◆ In order to disseminate the **Japanese culture of Safety**, JICA will support developing country's safety management capacity development through ODA Projects.

# Guidance for the Management of Safety for Construction Works In Japanese ODA Projects

App-13

## Comparison between Safety Plan of DHJV and that of Guidance (1)

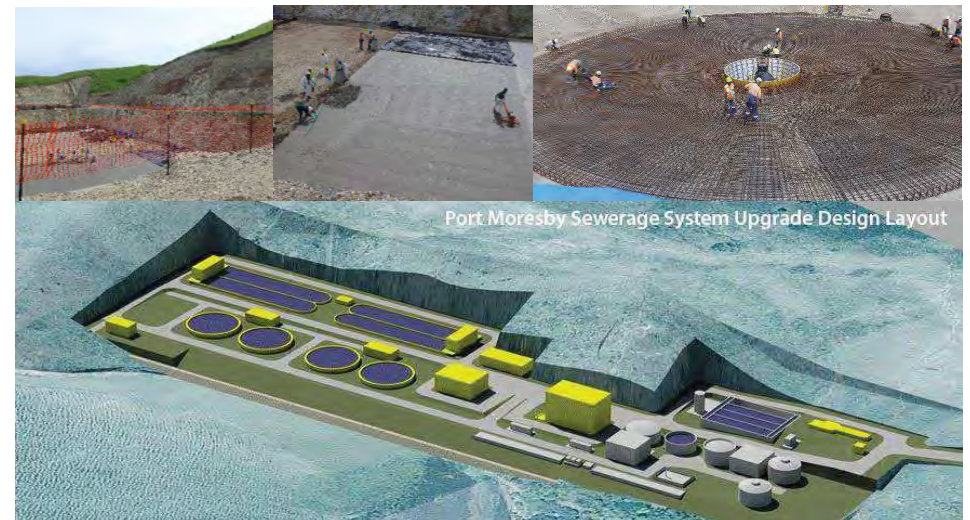
Clause	Contents	Page	Equivalent Clause in Guidance
1.0	Purpose and Scope	5	(1) Basic Policy for Safety Management
2.0	Policy	5	(1) ditto
3.0	Health and Safety Leadership and Commitment	6	(2) Internal Organizational Structure for Safety Management
4.0	Health and Safety Objectives	6	(1) Basic Policy for Safety Management
5.0	Legal and other obligation	7	(1) ditto (3) Promotion of PDCA Cycle
6.0	Accountability and Responsibility	9	(2) Internal Organizational Structure for Safety Management
7.0	Induction	11	(5) Safety Education and Training
8.0	Training and Competency	11	(5) ditto (7) Sharing Information
9.0	Communication and Consultation	13	(3),(5) & (7) ditto (6) Voluntary Safety Management Activities (8) Response to Emergencies and Unforeseen Circumstances

## Comparison between Safety Plan of DHJV and that of Guidance (2)

Clause	Contents	Page	Equivalent Clause in Guidance
10.0	Incident Management	18	(3) , (6), (7), (8)
11.0	Emergency Management	21	(8)
12.0	Risk and Operational Control	21	(3)
13.0	Construction Safety Control	25	(3)
14.0	Plant Inspection and Maintenance	32	(3)
15.0	Injury Management	33	(3), (4), (7)
16.0	Occupational Health and Hygiene	33	(6)
17.0	House Keeping	34	(6)
18.0	Personal Protecting Equipment (PPE)	34	(5)
19.0	Traffic Management	35	(3), (5)
20.0	Site Security	36	(6)
21.0	Audit Inspection and Review	37	(3), (6)
22.0	Reporting, Monitoring and Review of Performance	37	(3), (4), (6)

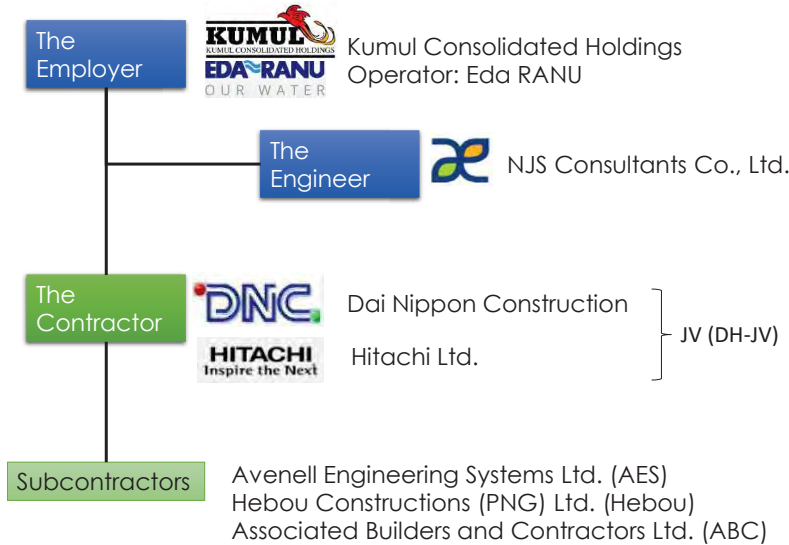
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(4) Monitoring  
(5) Safety Education and Training  
(6) Voluntary Safety Management Activities  
(7) Sharing Information  
(8) Response to Emergencies and Unforeseen Circumstances

## Section 3: Outline of Study results, Observation and Recommendation





# Project Organization



# Safety Management - Performance

Description	December-16			YTD		
Employees (man-day)	7,341	(man-day)		67,058	(man-day)	
Total hours worked (man-hour)	58,728	(man-hour)		536,464	(man-hour)	
	Fatalities	Incidents	Total	Fatalities	Incidents	Total
Casualty (person)	0	0	0	0	0	0
Lost-work time (day)	0	0	0	0	0	0
Lost-time (day)	0	0	0	0	0	0
CFFA: Casualty figure frequency rate	0			0		
LTIFA: Lost-time injury frequency rate	0			0		

Cumulative Working hours exceeded 500,000. LTI (Lost-Time Injury) is zero, hence LTIFR (LTI Frequency Rate) is zero. Objective is achieved so far.

JAPAN	2014	2015
General Contractor	0.91	0.92
Civil	0.88	1.37
Architecture	0.92	0.85

Figures shown in right-hand table are those (LTI not less than 1 day) of General Contractors in Japan, which include detailed break-down for figures.

# Safety Management - Compliance

Industrial Safety and Health regulatory framework  
Industrial Safety, Health and Welfare Act, 1961

(Chemical Treatment of Timber) Order, 1975  
(Explosive-powered Equipment) Order, 1973 (Monocrotophos) Order 1971  
(Lifts) Order 1968

Mining (Safety) Act 1977

(Excavation Works, Shafts and Tunnels) Order, 1968

(Building Works) Order 1967

(Tractors and Earthmoving and Mobile Construction Equipment) Order, 1965

Industrial Safety, Health and Welfare Regulation, 1965

Industrial Safety, Health and Welfare Act, 1961

According to an OSH Inspector of Department of Labour and Industrial Relations, new Occupational Safety and Health Act will be enacted within 2017.

Contract specifies "PNGS 1082-1991 Health and Safety at Work- Principles and Practice (AS 1470-1986) " as Health and Safety Regulation in PNG.

App-14

# Safety Management- Policy

DH-JV is

- to ensure the **Safety**, Health and Environmental Protection **of all stakeholders including the communities affected.**
- to manage and apply HSE-Management System **with every employee's involvement.**

All Managers and Supervisors have the responsibilities

- to pursue safety awareness among all employees
- to create a culture in which everyone shares responsibility for the wellbeing of their fellow workers, the communities...**
- to Provide safe working environment including specific work task Training

All employees have the responsibilities

- to execute their work safely
- to protect his/her safety and the safety of other workers...**

Subcontractors and suppliers will be required to operate with this Policy.

**Health, Safety and Environment Policy**

It will be the duty of Dai Nippon - Hitachi JV and key component of our work scope, to execute all of our activities in such a manner that will ensure the safety, health and environmental protection of all our employees, company, subcontractors, suppliers and the communities that are likely to be impacted by the project.

The Dai Nippon - Hitachi JV will manage and apply its Health, Safety and Environment Management System (HSE-MS) in such a manner that every employee shall be involved and ensure the effective implementation of our HSE-MS to assist in achieving the safe completion of POMSSUP Project.

All Managers and Supervisors of the Dai Nippon - Hitachi JV have the responsibility to vigorously pursue safety, health and environmental awareness among all employees, to manage tools and equipment and to create a culture in which everyone shares responsibility for the wellbeing of their fellow workers, the community and environment. Supervisors will be held accountable for the health and safety of workers under their supervision. Responsibility includes ensuring that machinery and equipment are safe and that work practices are in compliance with established legislation, workplace practices and procedures. To protect their health and safety, workers must receive adequate specific work task training.

All employees of the Dai Nippon - Hitachi JV have the responsibility to execute their work activities in such a manner as to prevent all circumstances which could lead to incidents that may cause personal injury or illness, security incidents or environment damage. Every employee must protect his/her health and safety and the health and safety of other workers by working in compliance with legislation and established workplace practices and procedures.

Subcontractors and suppliers will be required to operate in accordance to the Health, Safety and Environment policy of Dai Nippon - Hitachi JV. Health and safety is an integral part of this organization.

The Dai Nippon - Hitachi JV will implement this policy in combination with the Health, Safety and Environmental laws, regulations, Standards, policies and procedures of all applicable government agencies.

Shigeru Kawakami  
The contractor's Representative  
DAI NIPPON - HITACHI JV  
Date: 25 Jun '16

# Safety Management – Process Cycle of the Day

Time	Activities
07:00	Morning Gathering Radio Exercise, Safety & liaison Briefing Tool Box Meeting (JSA)
	Safety Check before work (machinery & Equipment)
07:XX-12:00	Working in the morning
12:00-13:00	Rest
From 13:00	Working in the afternoon
	13:00-13:XX Daily Work and Safety Meeting
16:00	End of the day

App-15

# Safety Management – Process System implemented on site (1)

**KCH(Employer)/NJS(Engineer)/DH-JV(Contractor)/Sub-contractors**

**DNC HITACHI**  
Inspire the Next  
DAI NIPPON-HITACHI JV

**INSTRUCTION SHEET No. 43 (SP-33)**  
CONSTRUCTION OF PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT

Contract # \_\_\_\_\_ Date 15 December 2016

Name	Position	Company
Mr. Denny Zamallo	Project Manager	AES
Mr. Cesar Tungol	Project Manager	HEBGO
Mr. Y. Yamada	Project Manager	DNC
Mr. S. Kawakami	Project Director	DNC
Mr. Johannes Ala	Building & Construction Mng.	ARC

Site Location: STP Site and Access Road

Safety Patrol conducted by the following representatives:

Employer	Engineer	Contractor	Sub-contractor
Aloysius Ahi	Sabaku Iwaki	Yusaka Ozawa	Watson Tones
			Larry Watson
			Sara Kaupa

**SAFETY**

Following today's Safety Patrol between the representatives of Employer, Engineer, Contractor and Sub-contractors, please take note of the following safety instructions that are numbered as agreed by the Engineer.

Action Plan	Target Completion Date	Status / Remarks
STP Area ST At Bridge Treatment Bldg, protect the barricades at least 1.0 metre away from edge of excavation (AES)	10/12/16	Not done
58 All ODE installed according to specification in tool wall. Reinstall and/or replace (AES)	10/12/16	Not done
Access Road 59 Backfill the excavation at the Kaugere line and remove the fence in some portion of excavation that remain, provide sump pits. (DNC/HEB)	10/12/16	Not done
60 Leveling of ground at CH 0 beside the pressure test area (DNC/HEB)	10/12/16	Not done
61 At CH 0, install on the top traffic sign at this area. Engineer suggests to remove the barriers after curing of concrete and open the Access to vehicles with vehicles but stop at somewhere CH 400 (DNC)	10/12/16	Not done

Prepared by: Mr. Y. Ozawa, Safety Manager, DNC

Received by: *Noted Sabaku Iwaki* (Engineer), *S. Iwaki* (Engineer)

At 14:00 on every Thursday, a weekly joint inspection (Site Patrol, SP) is held and instructions given are recorded and numbered.

DH-JV proposes action plan and obtains consent of NJS and carries out corrective action. Items are not deleted until appropriate actions have been agreed and completed.

DH-JV also carries out his own inspection.

# Safety Management – Process System implemented on site (2)

**KCH/NJS/DH-JV**

Once a month, a Safety Committee meeting is held with attendance of KCH/NJS/DH-JV.

Agenda are as follows.

- Review of last meeting minutes
- Review of safety statistics
- Review of Incidents for the month
- Safety issues

In this meeting, advises and recommendations are made for DH-JV to initiate various safety activities, such as rescue simulation exercise, Fire training etc.

**POMSSUP**  
SAFETY COMMITTEE MEETING No. 3  
DATE: 14<sup>th</sup> DECEMBER 2016  
TIME: 10:00 AM  
LOCATION: NJS CONFERENCE ROOM  
MINUTE OF MEETING

PARTIES:  Engineer  Contractor  Employer

ATTENDEES

Aloysius Ahi - Project Manager KCH	Yusaka Ozawa - Safety Manager DNC
Fabian Nitoso - Resident Engineer NJS	Ted De Boer - Safety Advisor DNC
Steven Yukuwani - Safety Coordinator POMSSUP	
Shigeru Kawakami - Project Manager DNC	

No.	Agenda	Action	By Whom	By When
1.	Review of last meeting minutes - Chairman - Fabian Nitoso	Meeting minutes was reviewed by S Yukuwani	N/A	
2.	Review Safety Statistics - Yusaka Ozawa	4.1 Safety Statistics for month of November and YTD figures. Safety Stats was reviewed.		
3.	Review Incidents for the month - DNC Safety Manager	Action item and close out date not clearly designated to responsible person.	Ted De Boer	31/01/17
4.	Safety Audit Report - S Yukuwani	<ul style="list-style-type: none"> <li>JSA training for all work crew</li> <li>Permit Authority to sign CSE Permit.</li> <li>JSA Quality Assessment to be conducted.</li> <li>CSE rescue simulation exercise to be conducted.</li> </ul>	T De Boer	01/02/17
5.	DNC to implement more proactive safety programme. If Nitoso	Contractor safety program was discussed. Listed topics are some areas for improvement		
6.	JICA - Safety Team Visit - F Nitoso	JICA visit is anticipated in January 2017. Fabian to provide firm schedule.	Fabian Nitoso	
7.	Meeting Close	Meeting closed at 11:00 am. Next meeting on 12 <sup>th</sup> January 2017.		

# Safety Management – Process System implemented on site (3)

**DH-JV/Sub-contractors**

At 13:00 Daily Work and Safety meeting is held in the meeting room of DH-JV with attendance of Sub-contractors. Interfaces between works are coordinated and safety instructions are also given. What is discussed is recorded, signed and distributed.

Items recorded are as follows.

- Work achievement from previous meeting
- Work Schedule till next meeting including Man power, Equipment etc.
- **Safety Instruction & Corrective Action**
- Material & Equipment
- Inspection & Test

This meeting is statutory requirement in Japan.

The image shows a detailed handwritten record of a safety meeting. It is organized into columns for different topics, likely corresponding to the list provided in the adjacent block. The text is dense and includes specific details about work progress, equipment status, and safety concerns. There are several signatures and dates visible, indicating the meeting took place on 12/16/16.



# Observations by Study Team (ST) (1)

- 1. Incident Reporting :** Even a small incident is reported as per request of KCH and explained in Safety Committee Meeting.
- 2. Training at Monthly Safety Gathering:** At the Monthly Safety Gathering, DH-JV carries out specific work task trainings including Sub-contractors' employees. Lifting work, JSA etc.
- 3. Accident Cause Analysis:** Accident Cause Analysis is explained in 10.4 Investigation of an Incident of Safety Plan. "It is essential that incidents and **near miss** be investigated in order to identify casual factors and associated underlying systematic weakness (the root causes)." Safety Alert process is also stated. In order to prevent the occurrence of similar accident in other projects, Safety Alert can be sent through Safety Manager to DNC and Hitachi.

Safety Alert  
(Template)

- ◆ Description of Incident
- ◆ Cause of Incident
- ◆ Photo (if relevant)
- ◆ Preventive measures required

App-16

# Observations by ST (2)

- 4. Risk Assessment:** Job Safety Analysis (JSA) is applied. According Sub-Clause 12.4.3 Safety Plan, "as a general rule, JSA should be conducted if there is any doubt about the safety of the job." Using risk matrix, Risk Rating is given by combination of the Consequence with the Likelihood. By Risk Rating, an action to be taken is given as follows.

Rating	Action	DNC HITACHI Inspire the Next		JOB SAFETY ANALYSIS (JSA)		JSA No. (Rev. JSA)	Revision No.																																									
<b>Critical:</b>	Do not start work. Do formal risk assessment and put in additional control	<b>RISK RATING / RISK ASSESSMENT</b>																																														
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# Observations by ST (3)

## 5. Prevention of Public Accident and Traffic Accident

STP site and its access road are in Kilakila area and close liaison and due care for the communities are required. ST learned that POMSSUP team (KCH/NJS/DH-JV) manages such issues and so far no incidents were reported. ST noted the followings.

- Employment of community persons for guards and traffic guide
- Rules for heavy vehicle not to stop on approach road to prevent children's entering under a vehicle
- Utilize accidents information outside of sites for prevention



# Recommendations by ST

ST recommends to revise the existing Safety Plan because it should be dynamic documents and to be updated for use on site for continual improvement.

Activities not clearly included	Improvement is required	Activities to be reconsidered
Weekly Joint Inspection	5.2 Contractual Health and Safety Requirement	Attachment 4 Training Matrix
Safety Committee Meeting	9.3.2 Safety Notice Board 9.3.3 Site Layout Plan	Attachment 6 Daily Pre-Start Meeting Form
Daily Work and Safety Meeting	Attachment 7 Incident Accident Reporting Structure	Attachment 9 Safe Work Method Statement Form and others
Monthly Safety Gathering	Attachment 10 Job Safety Analysis Form and others	

Thank you very much for  
your patience.





**Chapter 6: Technical Guidance for Safe Execution (by the Type of Accidents)**

- 6.1 Measures for Prevention of Fall Accidents
- 6.2 Measures for Prevention of Accidents Involving Flying or Falling Objects
- 6.3 Measures for Prevention of Accidents Involving Collapse of Structures
- 6.4 Measures for Prevention of Accidents Involving Construction Machinery
- 6.5 Measures for Prevention of Explosion Accidents
- 6.6 Measures for Fire Prevention
- 6.7 Measures for Prevention of Public Accidents
- 6.8 Measures for Prevention of Traffic Accidents
- 6.9 Protective Gear (Personal Protective Equipment)

**Comparison of two plans in the Guidance**

	Safety Plan	Method Statements on Safety
When	At the pre-construction stage	At the construction stage
Prepared by	Contractor	Contractor
Role	Basic Plan (basic policies on the general safety management and operation for the entire works at site)	Detailed Plan (specifics for the safe execution of works and safety measures for each type of work)
Items to be included	<ul style="list-style-type: none"> <li>(1) Basic Policies for Safety Management</li> <li>(2) Internal Organizational Structure for Safety Management</li> <li>(3) Promotion of the PDCA Cycle</li> <li>(4) Monitoring</li> <li>(5) Safety Education and Training</li> <li>(6) Voluntary Safety Management Activities</li> <li>(7) Sharing Information</li> <li>(8) Response to Emergencies and Unforeseen Circumstances</li> </ul>	<ul style="list-style-type: none"> <li>(1) Construction plant and machinery</li> <li>(2) Equipment and tools</li> <li>(3) Materials</li> <li>(4) Necessary qualifications and licenses</li> <li>(5) The order of command for the works</li> <li>(6) Work items</li> <li>(7) Procedure for the execution of the works</li> <li>(8) Foreseeable risks</li> <li>(9) Precautionary measures</li> </ul>
Timing of Submission	<ul style="list-style-type: none"> <li>• at the time specified in the tender/the contract documents</li> <li>• no later than seven (7) days prior to the commencement of the relevant works</li> </ul>	<ul style="list-style-type: none"> <li>• prior to commencement of the relevant works according to the execution plans</li> <li>• Date specified in the contract documents</li> </ul>
Reviewed by	Employer, Engineer	Employer, Engineer

**The Guidance for the Management of Safety for Construction Works on Japanese ODA Projects (the Guidance)**

**Chapter 1: General Rules**

**1.1 Purpose**

The Guidance contains the basic policies for safety management and technical guidance on specific methods for safe execution of works in order to prevent occupational accidents and public accidents on ODA construction projects for public and other facilities.

By fully understanding the Guidance and complying with the regulation therein, Project Stakeholders will be in a position to respect the basic human rights of all parties involved in ODA construction projects. This will help prevent the occurrence of occupational and public accidents by creating a culture of safety, and help realize social development in the recipient country. This is the purpose of the Guidance.

**1.2 Scope of Application**

The Guidance applies to works for public and other facilities to be constructed with ODA support (including both Grants and Loans) (hereinafter "ODA Projects").

**1.3 Plans for Safety Management**

Two plans for the safety management for construction work sites shall be prepared and implemented by the Contractor, namely the "Safety Plan" and "Method Statements on Safety."

**1.4 Roles and Responsibilities of Project Stakeholders**

The roles and responsibilities of Project Stakeholders (i.e. Employer, Engineer, Contractor, Subcontractor, Workers) specified.

**Chapter 2: Basic Policies for Safety Management**

- 2.1 Basic Principles of Safety Management
- 2.2 Compliance with Relevant Laws and Regulations
- 2.3 PDCA for Safety Management

**Chapter 3: Contents of the "Safety Plan"**

- 3.1 Composition of the "Safety Plan"
- 3.2 Basic Policies for Safety Management
- 3.3 Internal Organizational Structure for Safety Management
- 3.4 Promotion of the PDCA Cycle
- 3.5 Monitoring
- 3.6 Education and Training for Ensuring Safety
- 3.7 Voluntary Basis Safety Management Activities
- 3.8 Sharing Information
- 3.9 Response to Emergencies and unforeseen Circumstances

**Chapter 4: Contents of the "Method Statement on Safety"**

- 4.1 Composition of the "Method Statements on Safety"
- 4.2 Applicable Standards for the "Technical Guidance for Safe Execution of Works"

**Chapter 5: Technical Guidance for Safe Execution (by the Type of Work)**

- 5.1 Excavation Work
- 5.2 Pile Foundation Work
- 5.3 Formwork and Form Shoring System Work
- 5.4 Reinforcing Bar Work
- 5.5 Concrete Work
- 5.6 Work over Water
- 5.7 Demolition Work
- 5.8 Work where there is danger of oxygen deficiency
- 5.9 Slings Work



**Safety Policy for Construction Works in Japanese ODA Projects**

**1. Basic Concept**

The highest priority must be placed on ensuring safety and protecting human life in construction works of Japanese ODA projects. As an organization that supports economic and, social development in developing countries, Japan International Cooperation Agency (hereinafter referred to as JICA) is expected to ensure high safety standards on its construction sites. JICA is determined to improve prevention measures and reduce occupational accidents, with the aim of eventually eradicating all preventable accidents.

JICA recognizes its role in disseminating "the Japanese culture of safety" to all organizations and individuals engaged in Japanese ODA construction projects.

**2. Basic Policy**

**(1) Promoting the highest priority on safety for all construction works**

JICA will further promote maximum safety measures for prevention of occupational accidents. This will ensure that all parties in construction works prioritize safety and protecting human life, in compliance with the following basic policy for safety management.

**Basic Policy for safety management**

- Full implementation of measures to eliminate causes of accidents
- Full implementation of measures to prevent accidents
- Compliance with the related rules and regulation applied to Japanese ODA projects
- Full implementation of measures to prevent public accidents
- Full implementation of PDCA (Plan, Do, Check, Act) cycle of safety management
- Information sharing with all parties
- Ensuring participation of all relevant parties in construction safety measures

In order to ensure safety in construction works, JICA formulated "The Guidance for the

Management of Safety for Construction Works in Japanese ODA Projects." JICA is determined to improve the implementation of safety measures in compliance with the Guidance. JICA is also determined to promote the full implementation of safety measures through site visits by JICA experts and missions.

**(2) Promoting "the Japanese culture of safety"**

JICA will promote the dissemination of our experience in construction safety, which can be branded as "the Japanese culture of safety" in cooperation with employers, consultants and contractors.

- JICA will promote efforts to establish mechanisms of self-sustained and proactive occupational safety measures in relevant organizations, such as executing agencies, and will raise awareness on safety measures in developing countries.
- JICA will promote understanding among all parties in developing countries on the importance of prioritizing safety and protecting human life. We will also stress the need to invest in adequate safety management measures and highlight that by conducting appropriate safety management, efficiency, productivity and quality can be enhanced.

In order to disseminate "the Japanese culture of safety," JICA will support developing countries' safety management capacity development through ODA projects, including construction works and technical cooperation.

The Safety Policy for Construction Works in Japanese ODA Projects will be communicated to all employees and personnel who work for or on the behalf of JICA. It will also be made available to the wider public.

30 March 2015

Akihiko Tanaka  
President

Japan International Cooperation Agency