



KITWE VOCCATIONAL TRAINING CENTRE (KVTC)

(TOT) – HEO MASTER TRAINER COMBINED TRAINING

Hitachi Construction Machinery

PEO Ibaraki Training Centre, Tsuchiura, Japan

TOT # 07

13th November, 2023 to 17th November, 2023



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INTRODUCTION

The 7th Training of Trainer (TOT) program is in line with project activity 2.4, with the goal of improving technical skills for effective instruction in Heavy Equipment Operator (HEO) training courses. This TOT, organized by Hitachi Construction Machinery (HCM) Japan, served as a combined training for HEO master trainers. The focus of this TOT was on the operations and technical knowledge required for training, specifically on Dump Trucks, Excavators, and Wheel Loaders. The training occurred from November 11 to November 20, 2023, including travel dates, at the HCM Technical Training Center PEO Ibaraki – Tsuchiura, Japan.

TRAINING OBJECTIVES

The objectives of this training is to learn on the following;

- To learn how to instruct trainers and students on Excavator, Dump Truck and Wheel loader operations.
- To learn how to develop and present practical lesson plans for operator training.
- To be assessed as trainer of trainers by HCMJ.
- Complete an induction on Hitachi equipment namely Dump truck, Excavator, wheel loader.
- Benchmark on how to produce teaching materials for operator training. Learn on classroom handling:

FACILITATORS

The In-house training was conducted by the following;

| S # | NAME |
|-----|----------|
| 1 | Itou-San |
| 2 | Hara-San |
| 3 | Yogi-San |

PARTICIPATION

Participants of the In-house training was as follows;

| S # | NAME | TITLE |
|-----|-----------------|---------|
| 1 | Ms. Emily Mumba | Trainer |

| | | |
|---|----------------------|---------|
| 2 | Mr. Hasford Silwamba | Trainer |
| 3 | Mr. Freddie Mulenga | Trainer |

TRAINING PROCEEDINGS

DAY 1 - 13/11/23

MORNING SESSION FROM 0900HRS TO 1200HRS

The training begun with a site tour of Tsuchiura plant under the company of KENSHIN ITO. During the tour a number of things such as the history of its establishment, number of group companies, countries in which they have factories and the plant where the equipment were fabricated. The tour was let by Itou-san.

Whilst at the Tsuchiura Plant we were taken through the plant and exposed to the following

- The individual components for the undercarriage
- The individual components for the super structure and how they are assembled
- The individual components for the front attachments and how they are assembled
- The robotic welding of the boom and other mechanical components
- The complete assembly process of the excavator.

The plant shows a rich history of the evolution of technology by exhibiting the following machinery within their premises

- The first ever mechanical excavator made in 1949
- The first hydraulic excavator made in 1968
- A crawler dozer made in 1972

AFTERNOON SESSION FROM 1300HRS-1700HRS

In the afternoon we moved to the Technical Training Centre (TTC) in kisimugaura (PCE) where we were introduced to operator training Safety Operation Module by Itou-san.

The following were covered in the module

- General safety instruction
- Health management
- Organization of the job site
- Organization is the first step in safety operations
- Emergency first aid
- Preparation before operation
- Knowledge of the job site
- Knowledge of the job site

- Knowledge of the machinery
- Guiding instructions and signaling
- Precautions before starting the engine
- Confirming environmental safety
- Safe riding
- Precautions for starting the engine
- Checking the hydraulic system
- Operating the swing travel and front attachment and present condition
- Precaution for safety operation precaution for riding and getting on and off
- Prohibition beyond specifications
- Leaving the machine
- Travelling
- Economic operation of hydraulic excavator
- Traction precautions
- Save fuel by moderate engine RPM
- Crossing rivers
- Crossing bridges
- Driving on slopes and gradients
- Travel at night
- Operating on dangerous sites
- After work precautions
- Machine inspection
- Safe parking
- Accident prevention in servicing
- Machine condition
- Checking and adjustment precautions
- Precautions for servicing elevated portions of the machine
- Transportation precautions

DAY 2 - 14/11/2023

MORNING SESSION FROM 0900HRS TO 1200HRS

General Information (ZX200-5G)

The general information module was focused on ZX200-5G features with the following explained

- Machine overview
- Cab and its features
- Air conditioner unit location and associated parts
- Engine location and components of systems found on an engine

- Pump compartment
- Control valve's location
- Tank's location
- Undercarriage and its components
- Front attachments and other auxiliary systems

Maintenance (ZX200-5G)

Maintenance intervals and the importance of maintenance was talked about in details. The walkaround inspection involving the lower structures such as the undercarriage, front attachment and the inspection of the upper structure with all the structures found on it.

The instructor recommended the use of a manual in maintaining the hydraulic excavator and taking advantage of the monitor function to know in advance when certain intervals of maintenance are due and what should be changed.

The maintenance guide table is affixed to the reverse side of the tool box cover. Lubricate and/or service the parts at the intervals as instructed in the table so that all necessary maintenance can be performed regularly.

AFTERNOON SESSION FROM 1300HRS-1700HRS

Machine Observation (ZX200-5G)

In the afternoon we had actual machine observation of the ZX200-5G Hydraulic Excavator.

Monitor Function (ZX200-5G)

We were introduced to the multi-function monitor which displays various meters, indicators, radio and air conditioner, ten-key lock function, rearview camera image, work mode selection and maintenance screen. Screen Configuration

The multi-function monitor consists of the following screens. There are 7 menus, and a further 14 sub menus.

We were taught on how to access and set functions on the monitor using the select/set switch

Basic Hydraulic and Electrical System (Hydraulic Excavator)

In this module of Basic Hydraulic and Electrical System (Hydraulic Excavator), we were introduced to the following

- Outline of hydraulic excavator
- Line up of hydraulic excavators from ZX8U TO EX8000
- History of hydraulic excavators and model Name Designation
- Features of hydraulic excavators
- Suitable jobs

- Applications
- Main components layout (ZX200-5G)
- Name and function of main components
- Specifications of the following
 - Front end attachments
 - Engine output and bucket capacity
 - Swing, gradeability and operating weight
 - Types of shoes and ground pressure
 - Digging forces
 - Lifting capacity
 - Excavating methods

The basic knowledge module outlines the features of the hydraulic excavator, its limitation and how it can be used effectively to bring about increased productivity without abuse.

DAY 3 – 15/11/2023

MORNING SESSION FROM 0900HRS TO 1200HRS

Basic Structure and Function (Wheel Loader)

On day 3 we started the day with the basic structure and functions of a wheel loader. The main key take aways on this module were on the following

- Wheel loader overview
 - Product
 - Specifications
 - Part names and mechanisms of wheel loader
 - Lay out and operation system (cabin)
 - Mechanism and Parts Names by function (power transmission/steering systems/braking system/loading equipment/Electrical/control systems)

Maintenance (Wheel Loader)

The presentation covered all the information one needs to know about the wheel loader starting from component identification, systems layout, to maintenance

A comparison was made between power transmission HST and power transmission utilizing a torque converter

AFTERNOON SESSION FROM 1300HRS-1700HRS

Operator's Training Operator's Responsibilities Basic Operation (Dump Truck)

The presentation covered the following areas of the dump truck

- Operator responsibilities

- Basic operation
- Operating technics

The presenter emphasized the need for an operator to know the following

- One's obligation,
- One's role,
- The importance of attending shift briefing,
- The importance of obtaining applicable data before commencing a task
- The checking and inspection process conducted on the dump truck
- What should be checked on the dump truck during pre-start
- Safety of the machine
- Work place inspection
- Selecting the correct equipment for the job
- House keeping
- Defect reporting
- Equipment isolation and tagging
- Danger tags
- Mandatory PPE
- The importance of a two-way radio
- Horn signal use
- Vehicle movement and general traffic rules
- Operating in different work environment
- Spillage handling
- Refueling and service mobile equipment

The topic provided some basic, general information on the role of the haul truck operator.it also examined some basic servicing procedures which, if adopted should help to ensure that the machine is available for use when required.

Operator's Training Operating Techniques (Dump Truck)

The operating techniques covered the following

- Plan and prepare for operations
- Site inspection
- Safe driving
- Mounting and dismounting
- Operating efficiency and safety
- Queuing, queuing safety and queuing procedure
- Spotting technique and spotting precautions
- Loading techniques and precautions
- Overloading and its adverse effect

- Working under shovels/excavator
- Single sided loading
- Near side loading
- Shovel off side loading
- Double sided loading (1/3)
- Double sided loading (2/3)
- Double sided loading (3/3)
- Modified drive by (1/3)
- Modified drive (2/3)
- Modified drive (3/3)
- Loading with excavators top loading and bottom loading
- Loading with front end loaders
- Hauling
- Dumping (1/3) dumping (2/3)
- Dumping (3/3)
- Dumping over a prepared edge (1/2)
- Dumping over a prepared edge (1/2)
- Reversing at dumps (1/2) and precautions
- Tipping in the crusher
- Free dumping
- How to handle contamination in ore
- Operating under adverse condition
- Operating under power lines
- Hazard avoidance
- Emergency procedures
- Reporting procedure during an accident
- Radio response procedure
- How to handle fires such as on-board fires, tire fires
- How to handle an immediate tire failure
- What to do in case of a roll over situation

The topic provides detailed information on haul truck operating techniques that will be required as part of the equipment operator's role. A large section of this topic has also been devoted to the safety and hazard aspects that an operator can encounter when undertaking haul truck tasks

DAY 4 – 16/11/2023

MORNING SESSION FROM 0900HRS TO 1200HRS

Guidance was given with regard to assessment criteria and was conducted at Kasumigaura City, PEO College. The Assessment was conducted in the following areas

- Theory Test (30 Basic MCQs)
- Lecture Test (30min Presentation)

During presentations the three examiners assessed us independently and gave marks according to their own standard of evaluations.

AFTERNOON SESSION FROM 1300HRS-1700HRS

EXAMINERS Hara-san, Yogi-san and Itou-san

Practical Instruction Test (ZX200-5G/30min incl, Q&A)

Instructor Training

The afternoon session was for practical on Excavator and wheel loader with each examiner observing and assessing independently

DAY 5 – 17/11/2023

MORNING SESSION FROM 0900HRS TO 1200HRS

Proper Operation of Hydraulic Excavator

The learning objectives achieved during the lesson are summarized as follows

- hydraulic excavator maintenance
- methods of digging
- methods of travelling
- method of construction
- safety
- prohibited operation
- saving energy
- caution of wheeled excavator operation

It is very important to understand the essence of maintenance and how it contributes to the reduction of costs.

When the machine is in operation it becomes clear that the issues of economic use come in in order to save resources which are limited when carrying out operations

The safe, effective way of excavator use in digging, travelling, undertaking constructional works brings about a sustainable use of resources

The module further emphasizes the need to know the prohibited operation of an excavator.

AFTERNOON SESSION FROM 1300HRS-1700HRS

The learning objectives achieved during the lesson are summarized as follows

Operation Practice (ZX200-5G) (Wheel Loader) (Dump Truck Simulator)

using the sensor motion excavator gave us an experience that will make it possible for us to quickly learn how to operate the actual machine.

CHALLENGES

The following are some of the key challenges faced during execution of the training

1. Faced delays in the receipt of logistical support due to prolonged admin processes.

RECOMMENDATIONS

The following are some of the recommendations suggested for future Trainings:

1. Training on actual Dump truck to be conducted before commencement of training at KVTC.
2. Procure the wheel loader and dump truck and arrange inhouse TOT for dump truck and wheel loader with a master trainer at KVTC before commencement of training of beneficiaries.

CONCLUSION

In conclusion, the training was successfully executed, meeting all objectives, and the key lessons provided are outlined, covering various aspects of safety, equipment information, maintenance, and operational practices for different machines.



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| Event Name | HEO Master Trainer Combined Training |
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|------------------|----------|
| IO Number | 50750225 |
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| Venue | PEO Ibaraki Training Centre, Tschirua Japan |
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|-----------------|--------|
| Duration | 5 Days |
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|-------------------|-----------|
| Start Date | 13-Nov-23 |
|-------------------|-----------|

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|-----------------|-----------|
| End Date | 17-Nov-23 |
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| Facilitator | HCM JAPAN |
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| Assistant | NIL |
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| Batch Number | TOT 07 - MCTC |
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| Contact Hours | 48 HOURS |
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| Batch Score | - |
|--------------------|---|

| | |
|-----------------------|-----|
| Feedback Score | 50% |
|-----------------------|-----|

| | Report Prepared By: |
|------------------|---|
| Name | Chipo Nkomo |
| Signature |  |
| Date | 27-Nov-23 |

| | Received By: |
|------------------|--|
| Name | Chrispin Kakoma |
| Signature |  |
| Date | 27-Nov-23 |



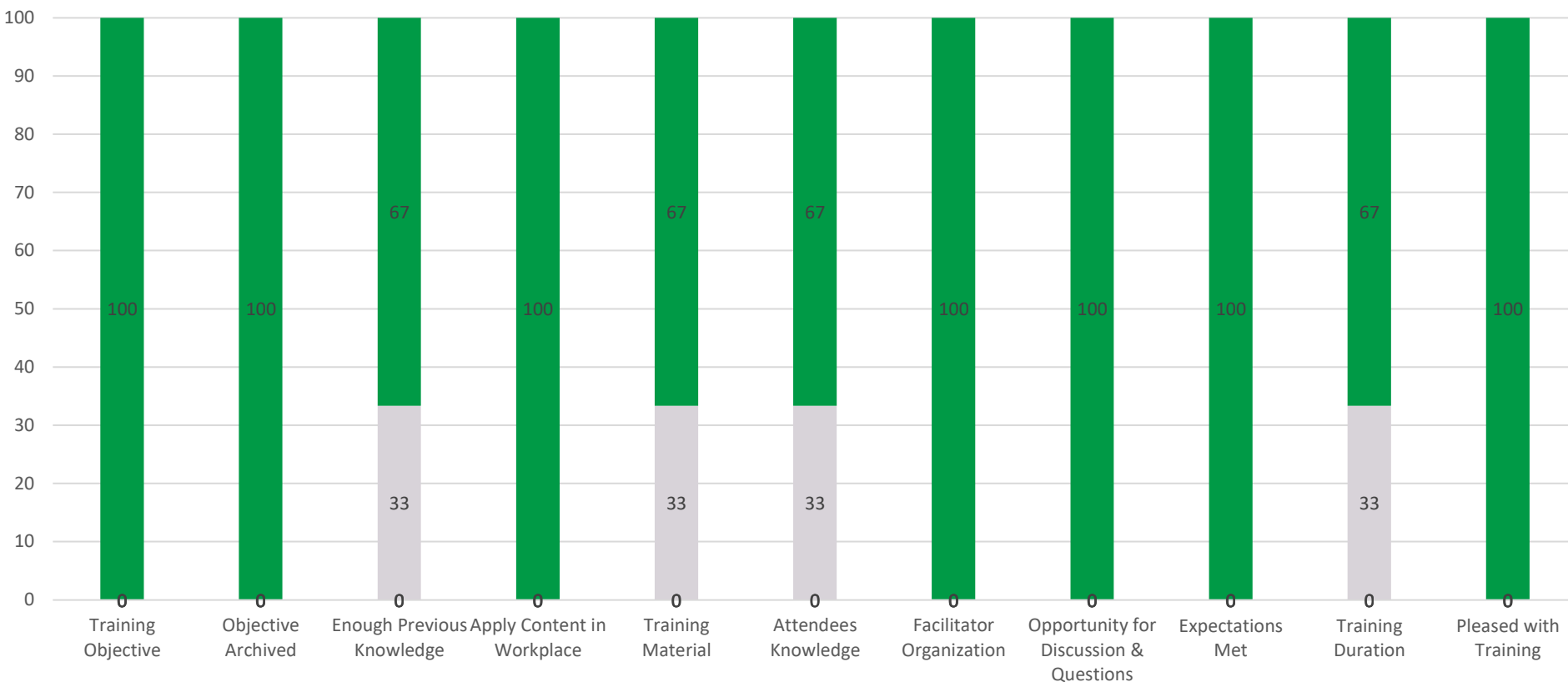
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TRAINING CONTENT FEEDBACK REPORT



I do not Agree at All (1) I strongly Agree (5)

■ 1 ■ 2 ■ 3 ■ 4 ■ 5



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WHAT DID YOU FIND MOST BENEFICIARY?

- ❖ Training of operations of the dump truck, wheel loader excavators and tactics of operating them in a safe manner
- ❖ Working culture was of high standard based on their corporate social responsibility
- ❖ Their teaching skills were highly beneficial



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WHAT DID YOU FIND LEAST BENEFICIARY?

- ❖ NOTHING
- ❖ NOTHING
- ❖ NOTHING



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ANY OTHER POINTS OF VIEW?

- ❖ Dump truck training is required on a real machine
- ❖ The trip has potential to change someone's mindset
- ❖ There instructors were well coordinated, kind and helpful
- ❖ The instructors showed great respect and were very helpful



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STAFF DEVELOPMENT

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Kitwe Vocational Training Centre

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November, 2023



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KVTC TRAINERS ATTENDING A THEORY CLASS



KVTC TRAINERS UNDERGOING AN ORIENTATION ON THE EXCAVATOR



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KVTC TRAINER BEING TRAINED ON AN EXCAVATOR



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KVTC TRAINER BEING TRAINED ON A WHEEL LOADER



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KVTC TRAINER BEING TRAINED ON A DUMP TRUCK SIMULATOR



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KVTC TRAINER BEING TRAINED ON A DUMP TRUCK SIMULATOR



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KVTC FEMALE HEO TRAINER MAKING A PRESENTATION



KVTC TRAINERS AFTER COMPLETING THE FIVE (5) DAY TRAINING



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