



SUMITOMO

SUMITOMO RUBBER THAILAND

HARUKI TAKAHASHI

CHOLADA WANGPIPATKIJ

TUMSAT

MU

About Our Factory Training in SUMITOMO RUBBER

Date : 17.Mar.2014 - 27. Mar.2014

Term : 2weeks

Participation : IE (Industrial Engineering)

Training : TPS Study - Find "MUDA" in Material Process

Safety Messages

Best : Have to keep my hair in the hat.
Don't use my mobile phone while walking.

Haruki : Sleeping enough.
Having meals enough.



Answer First :

We learned

Communication is everything.

Outline

1. Overview of Sumitomo Rubber (Thailand) Co., Ltd
2. Training Schedule

-TRAINING-

1. Structure of Radial Tire
2. About Ply assemble Machine
3. Cycle Time (CT)
4. Standard Work Combination Table
5. Standard Work Table (Lay out chart)
6. Problem / Solution
7. Action
8. Result

-IMPRESSION-

1. After Training - Haruki Takahashi
2. After Training - Cholada [Best] W.
3. Ruk – Sa – Kod

Overview

Sumitomo Rubber (Thailand) Co., Ltd

President : Mr. Toru Nagahata

Products :
Radial Tires for Passenger Car

Foundation : May 2005

Land area : 608,880 m²

Capacity : 73,450 pcs / day

Headcount : 6,311 employees including 33 Japanese

The Big Factory
In A-ma-ta City

Training Schedule

1st week :



17. Mar. : Orientation & Factory Tour

18. Mar. : TPS Studying – How to find “Muda”

19. Mar. : Observation

20. Mar. : Observation & Analysis

21. Mar. : Analysis

Training Schedule

2nd week :



24. Mar. : TEST & Checking

25. Mar. : Preparing “KAIZEN” presentation

26. Mar. : Preparing “KAIZEN” presentation

27. Mar. : Final presentation

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Structure of Radial Tire

7 materials

Joint less band

Polyester fiber :
To hold other materials

Tread

Contact point with road surface

Breaker

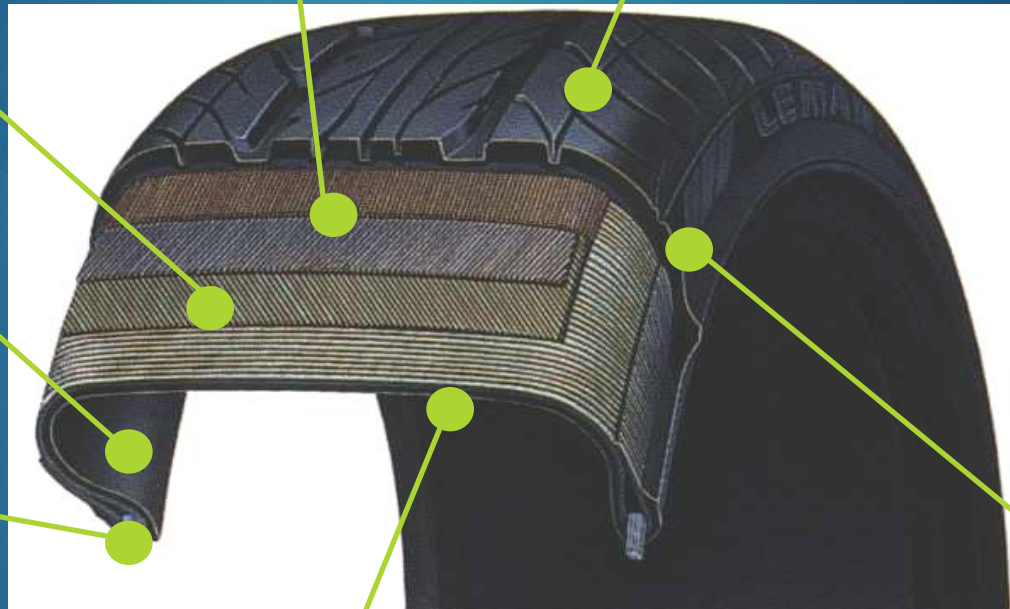
Steels :
To control elasticity

Inner liner

To keep air as tube

Bead

Band of piano wires :
To fix to a wheel



Side wall

Tough material :
To seal producer name & brand name

Ply

Polyester fiber :
To make frame of "Tire"

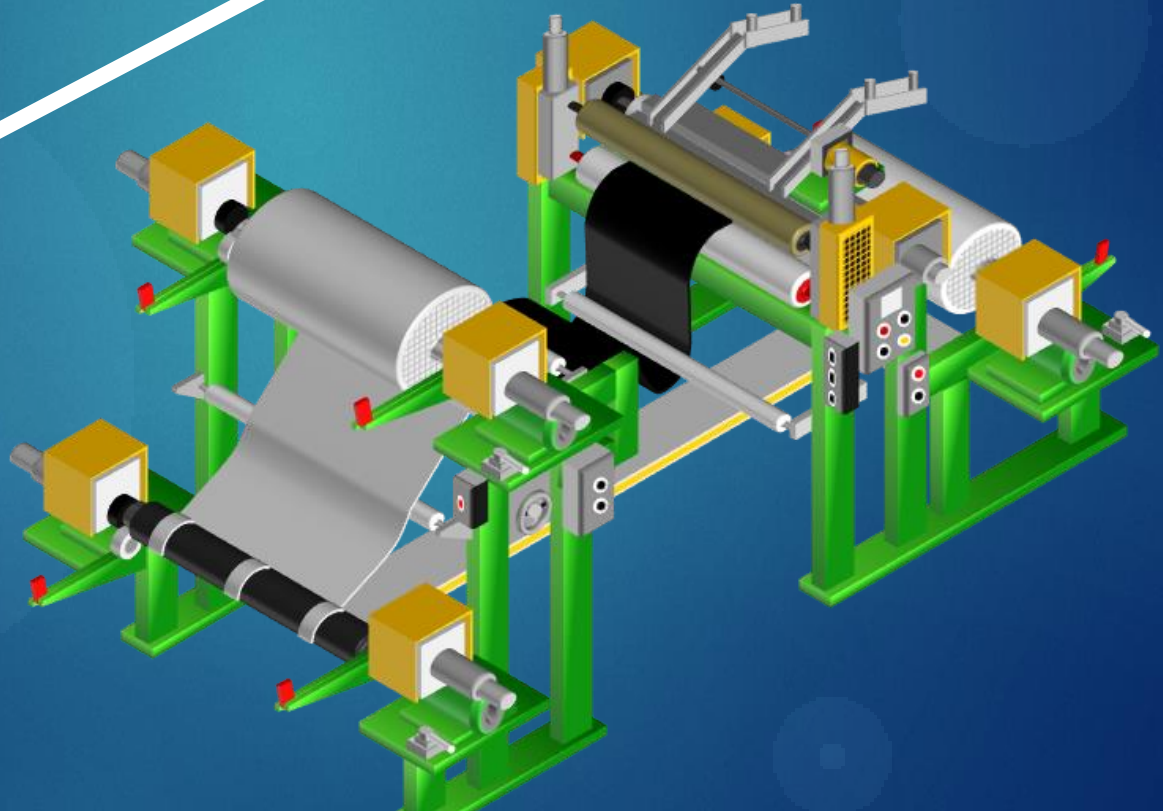
Ply assemble machine

To stick Edge Strip on Ply

Edge Strips + Ply

16 steps

Wind-up



-Training Result-

WOA (Work Observe Activity) Process



Studying



Visiting
process



Observation

Meeting & KAIZEN



Time Checking



-Training Result-

Cycle Time(CT)

No.	Step Operation	Cycle No.						minimum (CT-2)
		1	2	3	4	5	6	
1	Lift the products into the stock area	67	67	76	1	72	90	67
2	Set the Liner @Wind up Section	37	39	32	43	201	71	37
3	Feed the Liner	0	29	26	22	23	127	23
4	Set Edge Strip	131	92	112	64	123	6	112
5	Set and Feed the Ply	27	33	60	43	13	150	33
6	Cut the poly	27	26	39	68	15	16	27
7	Auto	1143	452	409	466	626	544	544
8	Reset	42	17	43	28	37	33	28
9	Feed the old Ply @Let off Section	27	12	0	156	0	0	27
10	Set and Join the Ply	78	40	143	0	196	158	40
11	Feed the New Ply @Let off Section	20	85	13	14	20	99	20
12	Change the Edge Strip	96	90	27	29	296	272	27
13	Record the data	22	20	67	74	55	70	55
14	Feed the Ply from Let off Section to Wind up section	12	106	44	65	25	57	25
15	Set the Edge Strip and Cut the Poly	52	117	53	35	140	92	52
16	Feed the old products	149	22	26	17	98	100	22
Total		1930	1247	1170	1125	1940	1885	1139

Time (sec)

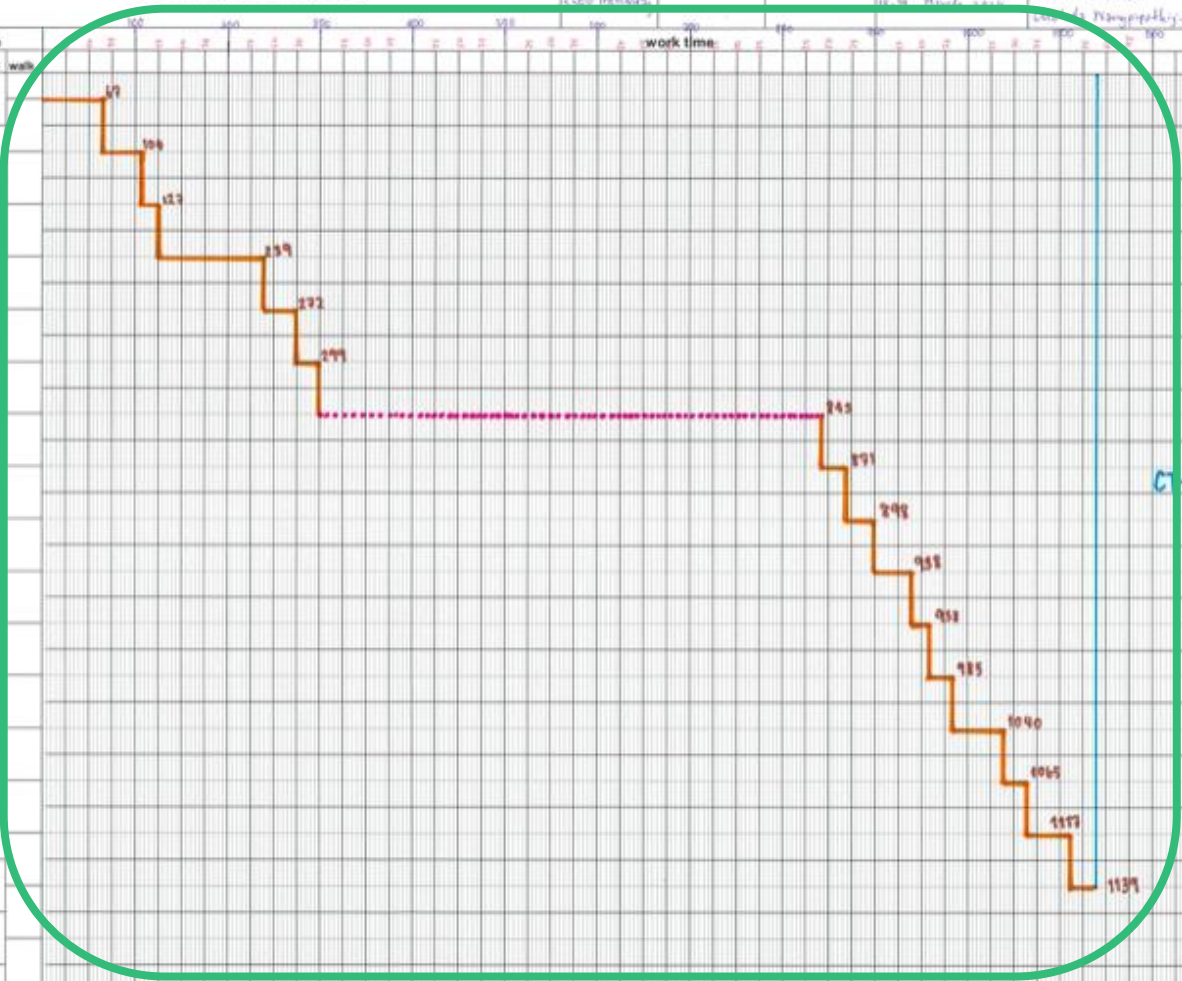
CT-2 (Standard Time)

-Training Result-

Standard Work Combination Table

Standard work combination table

Standard Work Combination Table			Production plan	Takt time	Cycle time	Making day	Record By	hand	Number		
Process:	Ply SA		2500 pcs/shift	300	300	16.7	Hayato Takahashi	****	Auto		
Product:							Wataru Yamaguchi		Auto		
order	work contents	time	work time								
		hand	Auto	walk							
1	Life Product into stock place	07									
2	Set Liner @ wind up	37									
3	Feed Liner	23									
4	Set Edge Strip and Measure	112									
5	Set Ply and Feed Ply	33									
8	Cut Poly	67									
7	Auto	544									
8	Reset	58									
9	Feed old Ply @ Let off	07									
10	Set and Join Ply	40									
11	Feed new Ply @ Let off	20									
12	Change Edge Strip	07									
13	Record data @ PC and notebook	55									
14	Feed Ply from Let off to Wind up	05									
15	Set Edge Strip and Cut Poly	02									
16	Feed old Product	00									
17											
18											
19											
20											
Total		595	544								



**CT-2 = 1139 sec
(Standard Time)**

-Training Result-

Problem / Solution

No.	Step Operations	Problems	Solutions
9	Feed the old Ply @Let Off Section	Operator has to search next Plys too long Liner / too short Ply SV has to wait while operator is recording	reduce stock areas (Next 1) use the fit Liner & design standard length make direction manual
10	Set and Join the Ply	Operator has to search next Plys too much cart Ply stock areas	reduce stock areas (Next 1) reduce cart stock areas (Next 1)
11	Feed the new Ply @Let Off section	the machine has to wait while operator's other tasks route loss (finding new Edge Strip)	make direction manual make another route & reduce stock areas & make direction manual
12	Change the Edge Strip	new Edge Strip stock areas is so far scissors position is dangerous	change new Edge Strip stock areas area & make another route design the box for keep scissors
13	Record	long record time (on notebook & PC) Operator do many things in the same time	record PC only (but ISO9001 needs recording on paper) & make easy operation make direction manual
14	Feed the Ply from Let Off to Wind up section	hand adjustment (tape guide)	auto adjustment (tape guide)
15	Set the Edge Strip and Cut the Poly	stop the machine & cut the blue tape in the machine Poly breaks many times R/L Edge Strip run out different time attach the blue tape for long time scissors position is dangerous wrong PolyBox position wrong Edge Strip position(right angle)	wait for blue tape go to PolyBox & cut blue tape at PolyBox change material & change the speed rate design the length of Edge Strip prepare the tapes or use the branch for hanging the tape design the box for keep scissors set PolyBox near the control set Edge Strip position behind the L-O
16	Feed the old products	Operator do many things in the same time	make direction manual
8	Reset	too much stock areas stop rolling to prevent Poly dropping out	prepare just next 1 use tray

-Training Result-

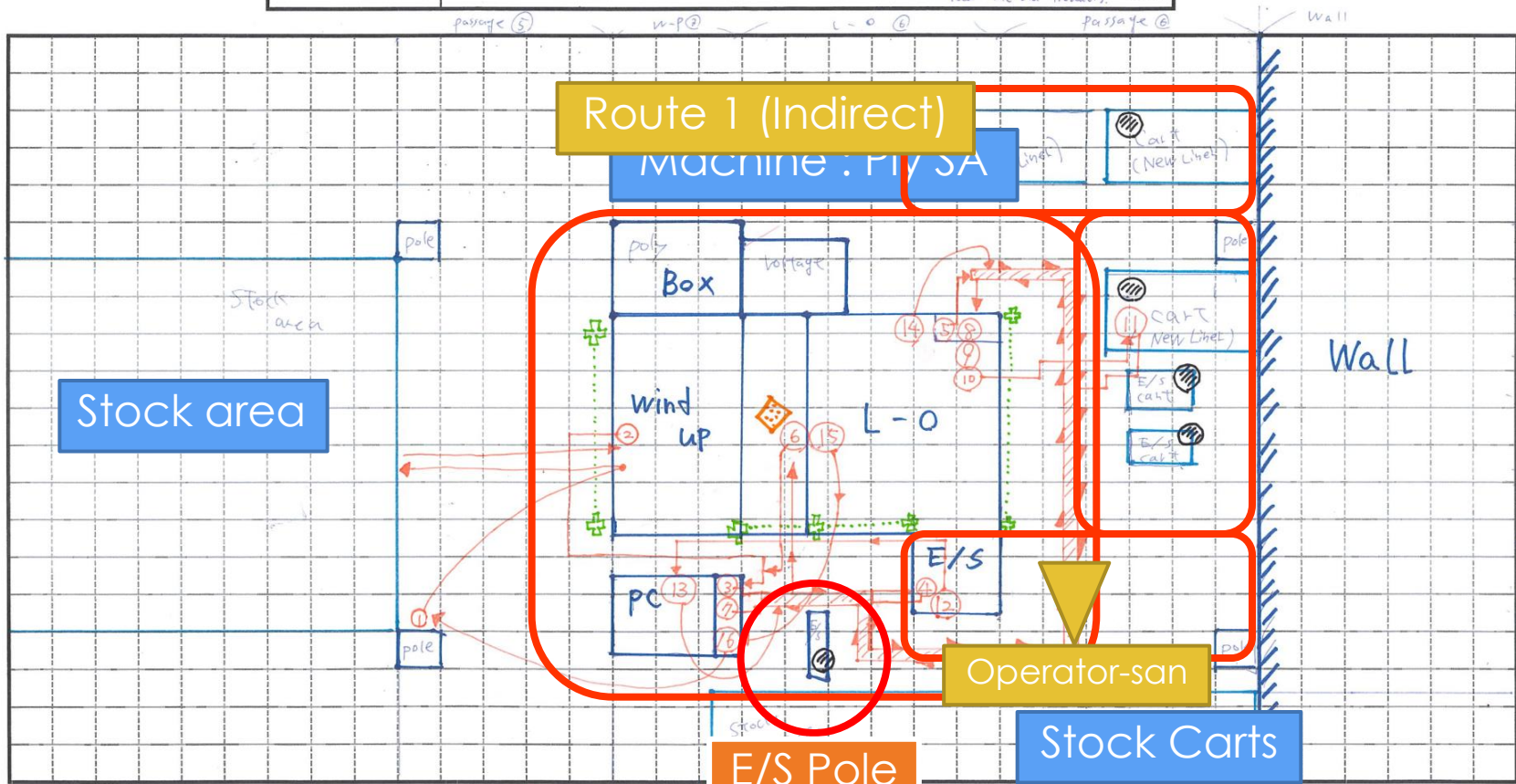
Standard Work Table (Lay out chart)

1 - length = 2 slices

Standard Work Table

Date:	18-19 March 2014
Record By:	Haruki and Best

Step Operation	Lift the Product into stock area	Start
	Feed the old Products.	Finish



- ① Lift product
- ② set Liner @ W-U
- ③ Feed Liner @ W-U
- ④ set E/s + Measure
- ⑤ set Ply + Feed @ L-0
- ⑥ cut poly
- ⑦ Auto
- ⑧ Reret @ L-0
- ⑨ Feed old ply @ L-0
- ⑩ set + join ply @ L-0
- ⑪ Feed new ply @ L-0
- ⑫ Change E/s
- ⑬ Record
- ⑭ Feed ply @ L-0
- ⑮ set E/s + cut poly

Quality	Safety	Stock	Stock Qty	W/WK	Q/CSTP	Q/T (Loss)
◇	+	●	6	/6		

-Training Result-

Simple Solutions

1. Reduce the stock behind the machine.
2. Prepare the tape or use the branch for hanging the tape.
3. Design the box for keeping the scissors.
4. Adjust the machine setting for stability.
5. Make the direction manual.
6. Change the route.

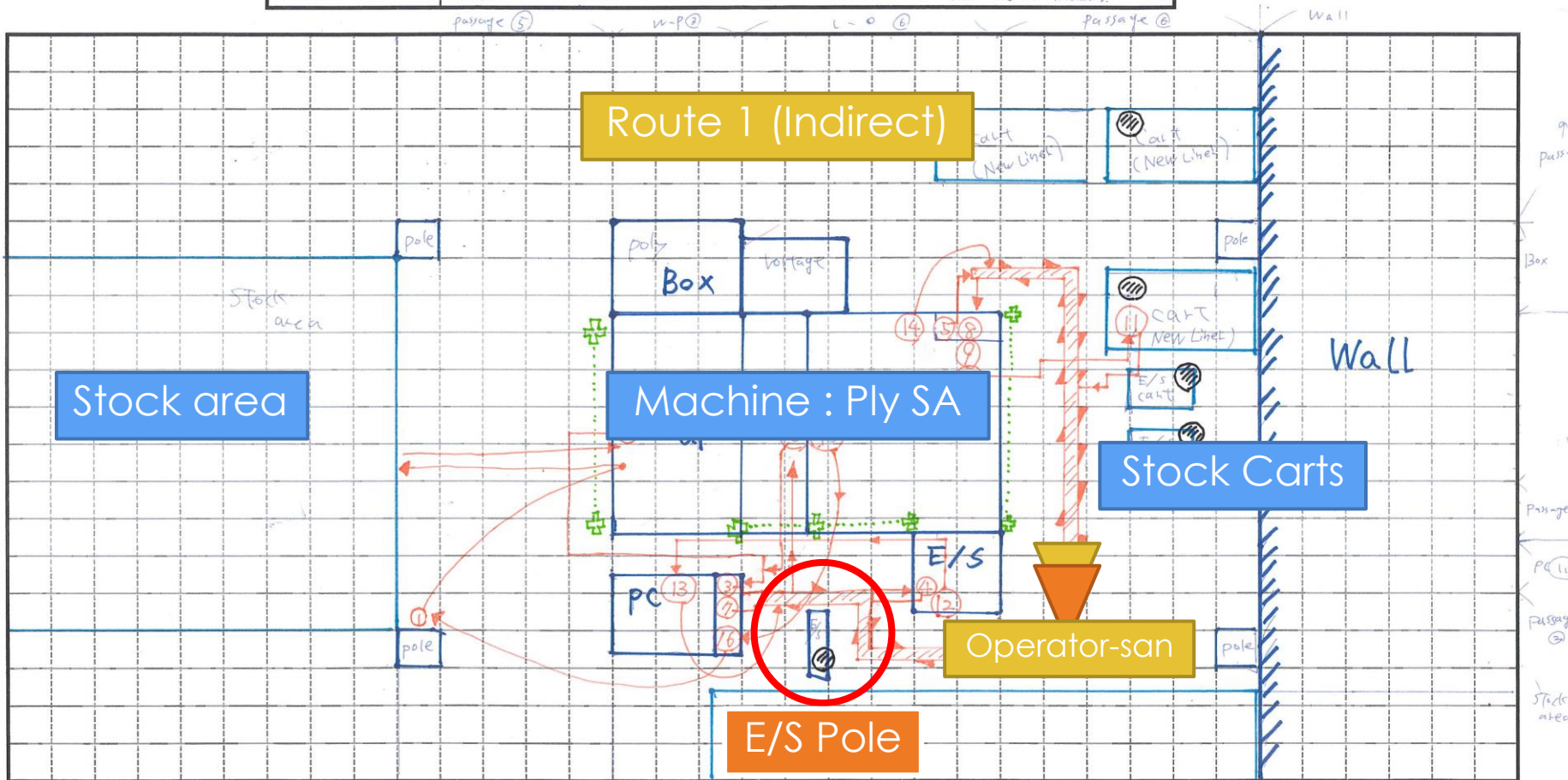
-Training Result-

Action

Standard Work Table

Date:	18-19 March 2014
Record By:	Haruki and Best

Step Operation	Lift the Product into stock area	Start
	Feed the old Products.	Finish



- ① cut poly
- ② Auto
- ③ Reset @ L-o
- ④ Feed old ply @ L-o
- ⑤ Feed M
- ⑥ Change
- ⑦ Record
- ⑧ Feed ply @ L-o

Route 2 (Direct)

Quality	Safety	Stock	stock No.	work	QT(STP)	QT(Loss)
			6	1/6		

-Training Result-

Result of Action

Action	Time (sec)		
	1	2	Avg.
Route 1 (Indirect)	156	157	157
Route 2 (Direct)	93	94	94

Direct Route can reduce time for 40%

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-IMPRESSION-

HARUKI TAKAHASHI

Good System

Making rule (STD.) Communication

FOUNDATION

-IMPRESSION-

CHOLADA [BEST] W.

- Can apply the WOA idea to every process.
- Learn about how to work in real life with foreigner.
- Communicate in working.
- Ruk – Sa – Kod (Keeps the rule).

รักษากฎครับ / ค่ะ

(Ruk – Sa – Kod – Krub/Ka)

ルールを守る

(Ru-ru wo mamoru)