

CHAPTER 6

CONCLUSION AND SUGGESTION

6.1. Conclusion

The total workload assigned in current condition shows that the distribution of operators' workload is not equal. The condition shows that the highest workload assigned to operator is nearly 30,000 indexes while the lowest workload assigned is only over 6,000 indexes with standard deviation 6401.99. The revised work shift considers the working hour per shift and the placement of operators. The new work shift is based on Miller's suggestion (1992) and adapts 9M-9D-6N model. After an adjustment into [4M-5D]-[4A-5E]-6N model, the new work shift has:

1. Morning Shift, starts at 06.00 and ends at 10.00 with 4 operators employed,
2. Day Shift, starts at 10.00 and ends at 15.00 with 5 operators employed,
3. Afternoon Shift, starts at 15.00 and ends at 19.00 with 5 operators employed,
4. Evening Shift, starts at 19.00 and ends at 00.00 with 4 operators employed, and
5. Night Shift, starts at 00.00 and ends at 06.00 in the next day with 2 male operators employed.

Morning Shift and Day Shift are initially derived from 9-hour Morning Shift of the model and Afternoon Shift and Evening Shift are initially derived from 9-hour Day Shift of the model. The new work shift also shows that the distribution of expected workload assigned per

month to all operators has been equally allocated. The highest workload assigned is now 17,641.91 indexes and the lowest workload assigned is now 14,446.73 with standard deviation 841.58.

6.2. Suggestion

The company should keep the workload distribution data updated at least every year to maintain that the operators' workload allocation is still equal. If the company hires additional operators in the future, then it should reanalyze the work shift to keep the workload still equally distributed. With two alternatives of work shift model, the company's manager may allow to discuss the work shift with the operators to appropriately deal which work shift model is suitable to be implemented in the company.

However, male operators who work in Night Shift should also start to live in a new regimen, according to K. Kroemer et. al. (2001) for setting the biological clock, obtaining restful sleep and maintaining satisfying social and domestic interactions for example:

1. Sleep should be taken directly after the shift, not in the afternoon,
2. Sleep time should be regular and kept free from interruptions,
3. Shift workers should seek to gain their family's and friends' understanding of their rest needs,
4. Certain times of the day should be set aside specifically and regularly to be spent with family and friends, etc.

The manager could also provide and suggest operators who work in Night Shift to have a rest or nap during Night Shift, according to T. Åkerstedt et. al. (2005). The study showed that driving home from night shift clearly caused incidents, decreased time to accidents, increased variability in lateral position, increased eye closure durations and increased subjective sleepiness. Having a rest or nap (company may allow operators to rest when there is no incoming vehicles to be served, between 03.00 and 05.00) is supposed to reduce all risks above, but not fully eliminate them if the operators still have sleep deprived. Manager may also give compensation and insurance to operators whenever they have got an accident or injury.

The manager must also concern with female operators who work in Evening Shift that ends at 00.00. In Indonesia, Ministry of Manpower and Transmigration (*Menteri Tenaga Kerja dan Transmigrasi*) released a Decree No. KEP.224/MEN/2003 in 2003 about female labors or workers who work between 23.00 and 05.00. On the decree, the manager must:

1. Provide nutritious food and beverage,
2. Maintain decency and safety in the workplace, and
3. Provide rides to pick up and drop off from and to their workplace.

Based on the decree, the manager of the company may provide transportation for female operators who work in Evening Shift that end at 00.00. The transportation should pick up female operators from the workplace

after they have finished their shift at 00.00 and the drop-off point must also be accessible and safe.



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APPENDICES

Appendix B - Data of Number of Incoming Vehicles to All Stations In January 2012

Table B.1. Number of Incoming Vehicles to Station 1

Hour	1/1/12		1/2/12		1/3/12		1/4/12		1/5/12		1/6/12		1/7/12		1/8/12		1/9/12		1/10/12		1/11/12		1/12/12		1/13/12		1/14/12		1/15/12		1/16/12	
	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2
00.00-01.00			8	62	5	13	8	38	4	50	13	33	11	28	12	66	3	49	5	27	9	49	3	12	9	38			4	29		13
01.00-02.00				24	4	8	4	30	3	21	5	13	4	10	5	23	1	33	4	15	5	27	2	9	2	16			6	28		3
02.00-03.00									5	7	1	7									4	10				3						1
03.00-04.00																																
04.00-05.00																																
05.00-06.00			6	33	1	5	6	24	2	18	4	8	1	3	7	17	1	20	3	11	6	33	2	35	10	35						6
06.00-07.00			10	84	7	31	13	72	13	60	10	57	18	57	7	60	20	65	7	33	4	70	3	25	5	28			3	26		35
07.00-08.00			16	136	6	76	2	100	4	155	2	133	6	137	2	68	3	150	4	87	3	140	2	233	4	142	4	140	4	76	6	221
08.00-09.00			1	130	3	137	2	112	5	157	3	134	6	145	2	93	4	165	3	97	10	188	3	234	3	240	7	160	4	63	4	218
09.00-10.00			2	144	4	127	4	106	4	139	2	103	7	117	8	85	8	165	1	138	9	153	2	209	4	180		176	6	72	6	221
10.00-11.00			6	93	4	171	8	110	8	165	6	129	5	154	2	99	6	140	3	107	13	127	5	236	1	184	4	135	5	62	4	235
11.00-12.00			5	125	6	126	2	84	3	163	5	125	14	159	3	91	10	140	1	94	8	165	8	201	5	165	6	160	6	42	6	224
12.00-13.00			4	128	2	158	4	65	2	192	4	75	11	152	4	61	8	153	5	106	5	193	1	200	1	108	16	188	8	34	3	195
13.00-14.00				116	5	97	6	38	3	170	2	97	10	114	1	91	8	116	1	74	9	200	7	247	3	156	21	216	10	40	6	172
14.00-15.00	9	104	8	145	1	120	4	123	6	162	5	89	6	162	2	129	6	131	6	65	11	80	4	100	10	133	3	91	4	75	4	118
15.00-16.00	3	107	4	153	6	139	3	134	7	168	6	74	3	161	1	118	2	172	2	65	2	70	6	98	13	130	3	89	4	80	8	119
16.00-17.00	1	142	5	167	5	206	1	148	6	184	5	79	2	187	4	152		182	5	90	17	77	7	103	8	212	1	150	3	118	8	192
17.00-18.00	3	147	3	158	5	188	1	152	5	162	1	104	5	167	2	152	7	178	4	95	3	107	4	140	6	179	1	146	4	174	1	166
18.00-19.00	1	117	6	141	3	191	5	145	3	177		97	2	214	2	176	5	190	6	87	3	91	2	109	7	124	5	172	2	141	3	142
19.00-20.00	1	145	1	165	6	133	4	124	1	181	11	126	1	151		170	6	185	2	90	2	87	8	106	4	137	5	126	3	190	1	158
20.00-21.00	4	140	4	139	3	147	4	168	1	171	5	134	2	188	4	237	10	155	1	85	4	83		95	3	154	4	191	2	186	3	212
21.00-22.00		125	3	104	2	105	1	109		171	2	85	4	176	2	168	1	162	1	65	9	46	5	106	4	101	5	106	1	185	3	168
22.00-23.00	10	64	7	35	12	73	11	85	11	54	2	61	8	83	4	86	13	58	11	61	6	23	5	47			3	44	2	35	8	61
23.00-00.00	4	53	6	30	8	54	10	61	8	36	9	32	10	79	4	60	7	48	12	55	4	21	6	33			2	34		27	9	44

Hour	1/17/12		1/18/12		1/19/12		1/20/12		1/21/12		1/22/12		1/23/12		1/24/12		1/25/12		1/26/12		1/27/12		1/28/12		1/29/12		1/30/12		1/31/12		
	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	
00.00-01.00	6	29	13	35	6	28	8	31	2	27	5	28	2	24	7	24	9	40	5	51	4	20	8	27	6	43	2	15	8	45	
01.00-02.00	4	15	8	27	3	19	9	20	3	15	4	12					2	26	3	23	3	18	3	7	5	18			2	24	
02.00-03.00																															
03.00-04.00																															
04.00-05.00																															
05.00-06.00	15	52	3	30	15	30	7	40			3	9	3	20	3	33	3	41	9	44	8	32	2	11	3	16	7	14	10	37	
06.00-07.00	5	71	8	78	19	44	13	42	11	42	7	50	4	53	6	35	5	84	3	60	9	24	2	68	13	42	3	50	4	43	
07.00-08.00	3	120	1	96	4	83	12	231	6	92	1	53	3	51	2	60	2	118	2	146	4	141	4	189	1	94	5	208	6	111	
08.00-09.00	7	123	1	115	2	103	19	252	1	107		87	3	65	5	76		124	4	199	1	163	3	211	3	92	8	193	5	163	
09.00-10.00	6	117	2	99		119	13	214	2	127	3	82	2	80	5	89		66	2	120	2	142	3	151	3	115	4	190	10	177	
10.00-11.00	5	121	6	107	3	122	14	207	3	137		77	8	102	4	129			4	133	2	174		155	3	112	15	238	8	156	
11.00-12.00	3	87	5	101	1	128	9	210	2	150		93	3	106	3	103			4	117	3	162	2	142	4	105	7	105	4	130	
12.00-13.00	2	97	1	71	1	118	7	183		157	2	95	7	118	5	102			2	150	3	156	1	117	1	113	9	180	2	160	
13.00-14.00	9	97	5	79	1	111	22	239		170		114	5	130	5	108			4	209	4	162	6	140	2	99	18	170	8	142	
14.00-15.00	2	109	5	125	5	120	6	72	8	87	2	44	4	101	1	182			3	113	13	100	7	66	8	63	7	80	9	110	
15.00-16.00	4	207	7	193	4	142	21	153	6	97	4	87	1	112	1	191			4	116	10	163	6	95	4	106	6	93	3	117	
16.00-17.00	3	238	3	182	3	119	20	183	3	113	3	81		111	3	191	24	418	6	151	9	158	4	107	12	93	4	98	6	119	
17.00-18.00	10	229	2	182	2	125	4	174	1	108	2	75	2	132	4	200	5	418	6	212	11	182	9	130	8	150	7	111	5	144	
18.00-19.00	1	279	5	132	16	136	9	167	2	142		50		114	1	187	8	425	4	145	7	165	6	132	3	155	3	113	4	151	
19.00-20.00	2	291	5	179		116	8	159	2	127		66	4	147		217	12	389	5	130	9	163	6	130	4	120	4	97	5	146	
20.00-21.00	2	198	6	178		105	2	179	2	137	1	60	1	149	2	206	12	363	2	150	9	150	7	171	8	123	2	91	5	145	
21.00-22.00	1	262	5	198	1	115	7	143	5	109	2	57	2	116		176	6	329	1	107	6	170	6	155	1	75	6	113	2	144	
22.00-23.00	12	100	11	66	12	41	6	62	3	55	8	65	9	64	9	80	6	67	8	31	9	64	9	78	8	51	5	82	6	56	
23.00-00.00	10	33	9	42	14	41	7	32	4	65	4	36	5	34	6	54	7	61	5	26	6	32	6	57	8	41	5	70	4	49	

Note: 4 = 4-wheeled vehicles; 2 = 2-wheeled vehicles

Table B.2. Number of Incoming Vehicles to Station 2

Hour	1/1/12		1/2/12		1/3/12		1/4/12		1/5/12		1/6/12		1/7/12		1/8/12		1/9/12		1/10/12		1/11/12		1/12/12		1/13/12		1/14/12		1/15/12		1/16/12		
	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	
00.00-01.00			3	20	7	8	3	26	6	11	3	4	4	10	5	17	4	7	12	5	3	15	3	13	4	7	3	24	9	28	3	9	
01.00-02.00			1	4	14	15	1	10	4	6	10	9	2	8	3	14	3	8	1	9	4	3	2	7	6	4		8	6	15	4	7	
02.00-03.00									3	4							2	4						2	3								
03.00-04.00																																	
04.00-05.00																																	
05.00-06.00			4	19	2	7	2	30	3	7					3	11	3	14	3	4	3	10							2	8			
06.00-07.00			27	45	19	35	1	17	14	23	5	14	6	36	11	24	23	35	18	40	7	25	6	46	11	24	8	49	14	40	7	22	
07.00-08.00			15	51	10	55	18	98	11	48	7	61	12	41	12	22	10	35	20	103	13	46	8	61	14	85	11	60	5	22	3	13	
08.00-09.00			25	61	15	78	14	75	16	54	15	75	10	34	16	27	5	40	11	82	12	36	9	83	3	70	21	34	15	24	7	33	
09.00-10.00			21	36	27	86	13	77	12	44	24	78	14	41	22	50	5	25	2	77			12	91			10	41	19	45	11	32	
10.00-11.00			31	52	26	58	19	57	21	38	7	58	17	25	23	40	13	45	5	75			9	45			7	34	9	28	11	25	
11.00-12.00			29	45	21	57	28	47	11	15	17	33	20	36	27	28	10	45	17	55			25	58			12	69	11	6	8	15	
12.00-13.00			29	40	38	79	24	60	7	15	18	7	7	34	18	37	5	40	18	90			21	48	14	65	4	41	2	1	2	17	
13.00-14.00			45	58	16	61	28	106			22	21	22	66	25	22	10	30	9	49			14	45	5	50	11	69	8	11	2	13	
14.00-15.00	13	26	13	21	18	47	22	27	9	14	28	60	23	21	17	34	17	55	10	47			18	34	13	43	13	34	14	25	25	54	
15.00-16.00	13	27	39	51	30	40	36	46	2	22	14	24	15	12	18	41	27	49	19	59			17	25	17	36	20	49	14	27	25	37	
16.00-17.00	17	49	29	61	15	37	27	78			24	64	18	35	19	45	28	74	12	45	20	68	13	59	19	51	25	80	27	42	45	106	
17.00-18.00	19	35	18	64	19	42	25	39			18	56	22	18	19	53	39	123	20	64	28	51	27	61	29	56	28	65	19	63	57	100	
18.00-19.00	14	43	15	46	16	34	19	45	27	51	24	122	24	40	11	68	33	84	13	35	27	44	14	65	12	53	16	66	16	64	26	85	
19.00-20.00	19	53	28	74	11	38	23	71	20	48	19	81	12	45	10	60	18	171	12	43	14	42	11	44	10	31	7	84	24	58	40	60	
20.00-21.00	17	36	14	46	16	32	32	55	24	32	23	66	14	40	15	84	35	68	16	57	11	43	6	51	13	53	11	76	18	60	31	89	
21.00-22.00	6	22	10	40	11	20	11	42	25	26	21	47	5	30	15	47	14	83	24	44	10	33	13	25	8	43	13	51	17	38	21	83	
22.00-23.00	5	27	10	32	16	25	14	18	11	16	7	30	12	29	12	31	11	23	6	30	7	10	9	12	12	53	11	40	6	25	7	28	
23.00-00.00	10	31	11	18	9	15	7	9	5	7	7	16	11	14	9	17	22	22	7	10	5	12	7	14	6	40	5	26	7	17	8	16	

Hour	1/17/12		1/18/12		1/19/12		1/20/12		1/21/12		1/22/12		1/23/12		1/24/12		1/25/12		1/26/12		1/27/12		1/28/12		1/29/12		1/30/12		1/31/12				
	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2			
00.00-01.00	4	23	11	6	6	14		9	4	11	3	13	10	29	2	9	6	18	11	6	5	6	9	7	11	25	8	14	8	8			
01.00-02.00	3	9	1		7	6	3	12	4	7	6	9	1	16	1	16	3	14	10	8	6	8	3	4	1	7	2	7	4	12			
02.00-03.00																																	
03.00-04.00																																	
04.00-05.00																																	
05.00-06.00	1	7		3					2	3	2	14	3	13	2	12		20					3	10		11	2	8	2	7			
06.00-07.00	12	40		24	12	5	5	22	7	7	7	26	11	24	13	40	8	40	8	22	9	11	8	29	12	26	9	27	4	40			
07.00-08.00	22	140	10	57	7	6	8	22	18	38	8	24	8	24	16	31	76	89	37	61	10	22	16	97	5	40	44	115	14	56			
08.00-09.00	13	62	31	45	9	26	3	19	22	19	15	61	21	28	16	30	91	80	26	67	19	51	22	63	9	47	65	125	23	44			
09.00-10.00	28	75	30	58	11	24	9	18	26	29	25	58	29	36	10	43	71	22	37	73	13	18	35	37	7	41	70	130	25	53			
10.00-11.00	25	47	20	40	18	49	7	17	34	35	23	68	36	33	15	39			45	79	27	30	21	48	8	42	88	140	34	31			
11.00-12.00	21	45	20	39	12	37	6	27	20	69	15	61	17	18	18	32			32	77	11	35	15	41	11	53	71	115	12	18			
12.00-13.00	7	42	38	37	15	53	4	13	30	41	18	80	38	16	16	41			24	46	7	32	42	49	8	59			13	32			
13.00-14.00	14	26	32	50	16	39	11	14	28	46	10	40	20	15	13	53			13	23	17	50	39	61	14	58			19	45			
14.00-15.00	10	28	16	38	8	27	30	34	12	50	14	54	12	83	16	53			12	55	16	24	21	31	16	27			33	28			
15.00-16.00	27	47	15	41	16	37	32	38	12	24	22	39	14	38	20	49	5		22	32	9	26	16	18	16	23			40	52			
16.00-17.00	23	58	25	75	20	40	28	30	19	57	18	62	25	43	25	50	71	60	36	40	32	77	25	29	29	55	32	55	56	63			
17.00-18.00	18	60	14	76	27	39	30	42	21	70	26	51	8	63	30	50	83	132	33	60	29	65	7	12	17	47	38	68	39	35			
18.00-19.00	16	77	12	75	15	38	19	34	12	50	27	47	5	54	26	81	74	47	18	54	16	18	20	59	22	58	35	53	23	33			
19.00-20.00	34	96	6	68	8	35	16	39	31	52	25	74	9	54	19	59	83	40	15	52	19	36	17	60	16	73	39	59	20	49			
20.00-21.00	28	78	15	76	20	54	20	36	11	89	19	51	8	82	16	53	87	48	19	46	18	29	20	36	33	84	25	64	25	53			
21.00-22.00	29	52	10	72	11	25	18	25	8	65	9	48	13	63	24	59	60	55	13	45	4	18	12	37	21	51	36	59	20	55			
22.00-23.00	8	36	18	12		32	15	11	7	36	5	33	4	38	6	40	14	17	6	12	11	16	5	17	8	31	12	23	11	27			
23.00-00.00	4	17	7	11	2	12	4	7	5	25	9	29	2	18	9	12	9	8	8	7	5	13	3	33	10	26	6	16	9	16			

Note: 4 = 4-wheeled vehicles; 2 = 2-wheeled vehicles

Table B.3. Number of Incoming Vehicles to Station 3

Hour	1/1/12			1/2/12			1/3/12			1/4/12			1/5/12			1/6/12			1/7/12			1/8/12			1/9/12			1/10/12			1/11/12			1/12/12			1/13/12			1/14/12			1/15/12			1/16/12			
	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H				
00.00-01.00				1	6		6	7	2	2	8	1	9	21	1	5	20	3	2		4	10	12	2	2	17	1	4	25	1	4	13		4	14		3	12	2	8	8	3	5	16	1	5	2		
01.00-02.00				4			3	4	1	2	2		6	10	3	3	8	2	2	6	2	3	9	3	2	12		2	2	4	1				5	10				11	2	3	20		7	12			
02.00-03.00												2	3								6	4	3	2	3	1																							
03.00-04.00																																																	
04.00-05.00																																																	
05.00-06.00				12	1		1	9		1	8			18	1												1	8		2	8		2	15												2	9		
06.00-07.00				16			5	30	2	18	35	4	4	30	3	3	16	1	13	19	8	3	14	2	5	19		5	31	2	10	13	3	11	30	1	8	28	3	14	37	6	6	15	3	17	40		
07.00-08.00				19	12	21	4	30	6	10	15	9	22	28	10	7	24	8	7	1	5	13	11	3	17	22	12	13	3	7	6	31	5	19	19	3	12	41	9	11	21	12	4	21	2	22	20		
08.00-09.00				17	35	6	12	35	18	8	15	22	12	26	14	20	31	13	25	18	21	21	22	5	26	20	12	18	20	12	17	26	11	21	37	14	20	27	18	8	21	18	18	12	9	25	14	1	
09.00-10.00				18	11	15	13	24	28	15	8	19	9	15	30	22	13	16	21	15	13	11	11	5	22	15	16	27	20	16	22	13	13	28	17	11	47	32	16	3	15	20	15	10	8	21	15	1	
10.00-11.00				21	9	13	13	28	18	29	27	18	17	13	13	32	14	12	20	18	15	12	7	11	23	15	12	25	18	8	15	30	3	23	13	13	36	30	11	19	20	22	13	10	4	35	26	1	
11.00-12.00				6	9	3	30	34	14	7	9	6	17	12	19	18	10	13	10	13	21	12	6	13	17	8	8	14	4	13	17	20	4	23	15	6	39	45	11	10	30	16	7	5	2	21	13		
12.00-13.00				20	6	5	14	22	20	14	11	9	15	19	12	13	9	11	14	12	15	13	13	11	15	6	15	8		17	20	30	8	22	17	12	29	34	7	21	43	25	12	7	2	24	19	1	
13.00-14.00				28	7	6	10	11	16	6	10	18	27	40	6	8		2	11	13	15	12	19	10	15	11	17	20	12	9	13	25	4	20	14	14	16	21	19	11	24	27	12	8	2	13	9		
14.00-15.00	16	14	1	25	14	7	17	6	12	7	13	12	11	12	14	12	13	9	14	2	9	12	5	9	16	6	6	16	9	11	32	32	9	11	10	8	23	13	10	5	4	15	18	8	2	10	13		
15.00-16.00	17	9	8	17	3	5	7	9	8	8	12	16	10	30	15	9	20	7	9	4	6	20	7	5	21	8	14	11	4	5	30	25	11	8	10	7	16	9	7	11	3	30	9	8	4	7	20	1	
16.00-17.00	17	15	1	8	4	6	20	15	6	26	25	20	22	12	18	11	17	12	20	10	18	8	15	8	24	9	12	17	6	1	8	5	17	21	22	25	23	8	17	8	3	25	9	15	8	10	23		
17.00-18.00	15	12	4	15	8	11	19	9	11	45	20	22	38	18	12	13	25	18	26	25	20	28	24	9	22	25	11	17	18	14	19	32	11	17	16	10	14	12	9	6		25	34	32	7	9	24	1	
18.00-19.00	15	23	2	2	8	3	15	10	13	17	17	13	8	8	7	22	20	14	21	17	9	8	9	3	20	39	10	12	3	13	5	16	7	4	13	14	15	21	9	10	49	16	31	34	1	4	14		
19.00-20.00	15	30	2	8	2	6	10	11	13	35	21	14	5	17	3	16	26	22	19	23	6	20	25	3	23	15	8	17	19	10	12	15	13	5	3	13	4	7	6	19	21	18	39	34	3	5	18		
20.00-21.00	14	12		5	10	3	9	6	9	15	10	9	16	10	5	15	14	8	19	25	3	25	38	5	23	11	7	15	20	7	7	3	2	15	13	3	6	14	2	2	22	9	22	11	3	6	8		
21.00-22.00	8	3		8	8	4	9	3	5	11	15	5	12	14	9	3	16	5	18	10	1	14	24	4	20	19	4	15	8	4		6	12	8	3	10	11	7	27	43	3	16	12	4	4	19			
22.00-23.00	6	2	1	6	22	1	12	16	2	4	17	12	5	12	6	10	3	6	3	13	3	5	15	1	13	25	6	9	9	6	6	12	1	5	1	3	8	17	4	5	14	1	8	14		21	12		
23.00-00.00	3	4		5	16	3	12	18		1	8	9	11	20	4	4	2	7	6	16	4	4	8	3	10	18	1	4	7		3	6		3	13		9	12	7	3	19	3	3	9		7	1		

Hour	1/17/12			1/18/12			1/19/12			1/20/12			1/21/12			1/22/12			1/23/12			1/24/12			1/25/12			1/26/12			1/27/12			1/28/12			1/29/12			1/30/12			1/31/12							
	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H	4	2	H								
00.00-01.00	2	5	2	4	4	18	1	1	4	1	1	4	3	4	2	2	5	12		3	3	1	2	10	2		8	23	1	4	3	3	2	2	2		6	2	1	3		3	18	2						
01.00-02.00		1	1	4	11	1	1				3	2	4						1		1	20					5	12			7	2	1	3	1	1	8		2	9		3	12	1						
02.00-03.00																																																		
03.00-04.00																																																		
04.00-05.00																																																		
05.00-06.00	7	12		2	18											1	2																																	
06.00-07.00	13	25		8	40	2	7	13	3	4	15	2	2	4	3	3	17		1	2	6	7	15	1			2	1	28	3	3	28	3	6	4	3	3	17	5	7	32		14	40						
07.00-08.00	16	35	6	15	23	2	11		5	23	29	9	6	19	5	9	14	6	6		4	10	5	3	5	3	4	14	36	6	3	15	8	8	13	8	11	22	2	5	3	4	8	7	4					
08.00-09.00	12	45	10	11	4	14	15	9	3	32	27	16	11	41	11	15	18	4	7	2	5	15	12	6	4		6	11	18	12	6	16	7	11	22	18	7	11	22	18	7	12	2	3		6	10	12	10	
09.00-10.00	25	23	14	25	22	17	17	10	14	24	24	12	18	27	17	17	16	13	4	1	7	29	23	16	2	1	6	26	13	18	4	11	11	15	18	21	10	16	9	2		7	11	12	19					
10.00-11.00	9	17	10	33	8	18	15	5	7	30	14	21	11	37	20	16	12	7	2	2	4	24	7	14	15	55	18	13	17	12	4	12	18	11	13	26	15	14	8	6		8	11	9	11					
11.00-12.00	11	11	21	19	17	2	11	4	8	18	27	11	16	42	23	28	6	14	2	1	5	18	19	9	15	61	10	27	17	7	12	10	8	20	17	29	14	16	3	24	6	7	15	10	7					
12.00-13.00	15	8	12	15	13	4	11	7	9	18	17	10	15	27	25	17	4	11	5	2	7	8	5	7	9	55	12	16	24	11	8	9	12	14	22	23	11	18	7	48	12	9	14	11	9					
13.00-14.00	11	27																																																

**Appendix C - Number of Vehicles Served by Operators
Data Form**

Name: _____
 Day/Date: _____
 Working Shift: **MORNING** (07.00-14.00)
 Station: **1 2 3 4** *Please circle (information of station on rear page)

Hour	Vehicles Type		
	Four-Wheeled (Cars)	Two-Wheeled (Motorcycles)	Heavy (Trucks, Bus, etc.)
07.00-08.00			
08.00-09.00			
09.00-10.00			
10.00-11.00			
11.00-12.00			
12.00-13.00			
13.00-14.00			

Figure C.1. Data Form for Morning Shift

Name: _____
 Day/Date: _____
 Working Shift: **DAY** (14.00-22.00)
 Station: **1 2 3 4** *Please circle (information of station on rear page)

Hour	Vehicles Type		
	Four-Wheeled (Cars)	Two-Wheeled (Motorcycles)	Heavy (Trucks, Bus, etc.)
14.00-15.00			
15.00-16.00			
16.00-17.00			
17.00-18.00			
18.00-19.00			
19.00-20.00			
20.00-21.00			
21.00-22.00			

Figure C.2. Data Form for Day Shift

Name: _____
 Day/Date: _____ / _____
 Working Shift: **NIGHT** (22.00-07.00)
 Station: **1** **2** **3** **4** *Please circle (information of station on rear page)

Hour	Vehicles Type		
	Four-Wheeled (Cars)	Two-Wheeled (Motorcycles)	Heavy (Trucks, Bus, etc.)
22.00-23.00			
23.00-00.00			
00.00-01.00			
01.00-02.00			
02.00-03.00			
03.00-04.00			
04.00-05.00			
05.00-06.00			
06.00-07.00			

Figure C.3. Data Form for Night Shift

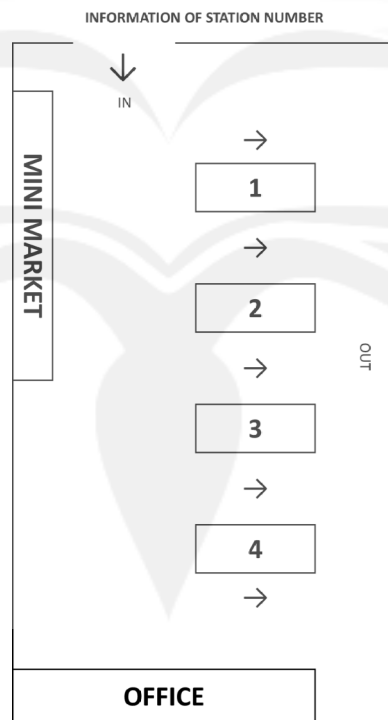


Figure C.4. Information of Station Number

Appendix D - Workload Unit Assessment Data Form
(Adopted from NASA Task Load Index (TLX) Form)

NASA-TLX BASED WORKLOAD ASSESSMENT FORM
PERTAMINA DIPONEGORO SPBU 74.94205

Name : _____

Gender : Male/Female (please circle)

Vehicle type : 2-wheeled/4-wheeled/Heavy

1. MENTAL DEMAND (thinking, deciding, remembering, etc.)
|-----|-----|-----|-----|-----|
Low High

2. PHYSICAL DEMAND (physical exertion/activity)
|-----|-----|-----|-----|-----|
Low High

3. TEMPORAL DEMAND (time pressure)
|-----|-----|-----|-----|-----|
Low High

4. EFFORT (how hard you worked)
|-----|-----|-----|-----|-----|
Low High

5. PERFORMANCE (success in accomplishing the task)
|-----|-----|-----|-----|-----|
Perfect Failure

6. FRUSTRATION (irritation, discouraged)
|-----|-----|-----|-----|-----|
Low High

TOTAL RATING : _____
AVERAGE : _____

