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LAMPIRAN

Lampiran 1. Proses Objek Penelitian



Lampiran 2. Proses Objek Penelitian



Lampiran 3. Kondisi Objek Penelitian



Lampiran 4. Proses Objek Penelitian



Lampiran 5. Penilaian RULA Agung

ERGONOMICS PLUS **RULA Employee Assessment Worksheet** Task Name: Agung Date:

A. Arm and Wrist Analysis

Step 1: Locate Upper Arm Position:

Step 1a: Adjust...
If shoulder is raised: +1
If upper arm is abducted: +1
If arm is supported or person is leaning: -1

Step 2: Locate Lower Arm Position:

Step 2a: Adjust...
If either arm is working across midline or out to side of body: Add +1

Step 3: Locate Wrist Position:

Step 3a: Adjust...
If wrist is bent from midline: Add +1

Step 4: Wrist Twist:
If wrist is twisted in mid-range: +1
If wrist is at or near end of range: +2

Step 5: Look-up Posture Score in Table A:
Using values from steps 1-4 above, locate score in Table A

Step 6: Add Muscle Use Score
If posture mainly static (i.e. held >10 minutes), Or if action repeated occurs 4X per minute: +1

Step 7: Add Force/Load Score
If load < 4.4 lbs. (intermittent): +0
If load 4.4 to 22 lbs. (intermittent): +1
If load 4.4 to 22 lbs. (static or repeated): +2
If more than 22 lbs. or repeated or shocks: +3

Step 8: Find Row in Table C
Add values from steps 5-7 to obtain Wrist and Arm Score. Find row in Table C.

B. Neck, Trunk and Leg Analysis

Step 9: Locate Neck Position:

Step 9a: Adjust...
If neck is twisted: +1
If neck is side bending: +1

Step 10: Locate Trunk Position:

Step 10a: Adjust...
If trunk is twisted: +1
If trunk is side bending: +1

Step 11: Legs:
If legs and feet are supported: +1
If not: +2

Step 12: Look-up Posture Score in Table B:
Using values from steps 9-11 above, locate score in Table B

Step 13: Add Muscle Use Score
If posture mainly static (i.e. held >10 minutes), Or if action repeated occurs 4X per minute: +1

Step 14: Add Force/Load Score
If load < 4.4 lbs. (intermittent): +0
If load 4.4 to 22 lbs. (intermittent): +1
If load 4.4 to 22 lbs. (static or repeated): +2
If more than 22 lbs. or repeated or shocks: +3

Step 15: Find Column in Table C
Add values from steps 12-14 to obtain Neck, Trunk and Leg Score. Find Column in Table C.

Scores

Table A: Upper Arm, Lower Arm, Wrist Twist

Upper Arm	Lower Arm	Wrist Twist	Wrist Twist	Wrist Twist	Wrist Twist
1	1	1	2	2	3
2	2	2	2	2	3
3	3	3	3	3	4
4	4	4	4	4	5
5	5	5	5	5	6
6	6	6	6	6	7

Table B: Neck, Trunk, Leg Score

Neck Posture Score	Legs	Legs	Legs	Legs	Legs
1	1	2	3	4	5
2	2	3	4	5	6
3	3	4	5	6	7
4	4	5	6	7	8
5	5	6	7	8	9
6	6	7	8	9	10

Table C: Neck, Trunk, Leg Score

Neck, Trunk, Leg Score	Neck, Trunk, Leg Score	Neck, Trunk, Leg Score	Neck, Trunk, Leg Score	Neck, Trunk, Leg Score	Neck, Trunk, Leg Score
1	2	3	4	5	6
2	3	4	5	6	7
3	4	5	6	7	8
4	5	6	7	8	9
5	6	7	8	9	10
6	7	8	9	10	11
7	8	9	10	11	12
8	9	10	11	12	13
9	10	11	12	13	14
10	11	12	13	14	15
11	12	13	14	15	16
12	13	14	15	16	17
13	14	15	16	17	18
14	15	16	17	18	19
15	16	17	18	19	20
16	17	18	19	20	21
17	18	19	20	21	22
18	19	20	21	22	23
19	20	21	22	23	24
20	21	22	23	24	25
21	22	23	24	25	26
22	23	24	25	26	27
23	24	25	26	27	28
24	25	26	27	28	29
25	26	27	28	29	30
26	27	28	29	30	31
27	28	29	30	31	32
28	29	30	31	32	33
29	30	31	32	33	34
30	31	32	33	34	35
31	32	33	34	35	36
32	33	34	35	36	37
33	34	35	36	37	38
34	35	36	37	38	39
35	36	37	38	39	40
36	37	38	39	40	41
37	38	39	40	41	42
38	39	40	41	42	43
39	40	41	42	43	44
40	41	42	43	44	45
41	42	43	44	45	46
42	43	44	45	46	47
43	44	45	46	47	48
44	45	46	47	48	49
45	46	47	48	49	50
46	47	48	49	50	51
47	48	49	50	51	52
48	49	50	51	52	53
49	50	51	52	53	54
50	51	52	53	54	55
51	52	53	54	55	56
52	53	54	55	56	57
53	54	55	56	57	58
54	55	56	57	58	59
55	56	57	58	59	60
56	57	58	59	60	61
57	58	59	60	61	62
58	59	60	61	62	63
59	60	61	62	63	64
60	61	62	63	64	65
61	62	63	64	65	66
62	63	64	65	66	67
63	64	65	66	67	68
64	65	66	67	68	69
65	66	67	68	69	70
66	67	68	69	70	71
67	68	69	70	71	72
68	69	70	71	72	73
69	70	71	72	73	74
70	71	72	73	74	75
71	72	73	74	75	76
72	73	74	75	76	77
73	74	75	76	77	78
74	75	76	77	78	79
75	76	77	78	79	80
76	77	78	79	80	81
77	78	79	80	81	82
78	79	80	81	82	83
79	80	81	82	83	84
80	81	82	83	84	85
81	82	83	84	85	86
82	83	84	85	86	87
83	84	85	86	87	88
84	85	86	87	88	89
85	86	87	88	89	90
86	87	88	89	90	91
87	88	89	90	91	92
88	89	90	91	92	93
89	90	91	92	93	94
90	91	92	93	94	95
91	92	93	94	95	96
92	93	94	95	96	97
93	94	95	96	97	98
94	95	96	97	98	99
95	96	97	98	99	100

Scoring: (final score from Table C)
1-2 = acceptable posture
3-4 = further investigation, change may be needed
5-6 = further investigation, change soon
7 = investigate and implement change

Original Worksheet Developed by Dr. Alan Hedge. Based on RULA: a survey method for the investigation of work-related upper limb disorders, McAtamney & Corlett, Applied Ergonomics 1993, 24(2), 91-99.

Lampiran 6. Penilaian RULA Ando

ERGONOMICS PLUS RULA Employee Assessment Worksheet

Task Name: Ando Date: _____

A. Arm and Wrist Analysis

Step 1: Locate Upper Arm Position:

Step 1a: Adjust...
If shoulder is raised: +1
If upper arm is abducted: +1
If arm is supported or person is leaning: -1

Step 2: Locate Lower Arm Position:

Step 2a: Adjust...
If either arm is working across midline or out to side of body: Add +1

Step 3: Locate Wrist Position:

Step 3a: Adjust...
If wrist is bent from midline: Add +1

Step 4: Wrist Twist:
If wrist is twisted in mid-range: +1
If wrist is at or near end of range: +2

Step 5: Look-up Posture Score in Table A:
Using values from steps 1-4 above, locate score in Table A

Step 6: Add Muscle Use Score
If posture mainly static (i.e. held >10 minutes), Or if action repeated occurs 4X per minute: +1

Step 7: Add Force/Load Score
If load < 4.4 lbs. (intermittent): +0
If load 4.4 to 22 lbs. (intermittent): +1
If load 4.4 to 22 lbs. (static or repeated): +2
If more than 22 lbs. or repeated or shocks: +3

Step 8: Find Row in Table C
Add values from steps 5-7 to obtain Wrist and Arm Score. Find row in Table C.

B. Neck, Trunk and Leg Analysis

Step 9: Locate Neck Position:

Step 9a: Adjust...
If neck is twisted: +1
If neck is side bending: +1

Step 10: Locate Trunk Position:

Step 10a: Adjust...
If trunk is twisted: +1
If trunk is side bending: +1

Step 11: Legs:
If legs and feet are supported: +1
If not: +2

Step 12: Look-up Posture Score in Table B:
Using values from steps 9-11 above, locate score in Table B

Step 13: Add Muscle Use Score
If posture mainly static (i.e. held >10 minutes), Or if action repeated occurs 4X per minute: +1

Step 14: Add Force/Load Score
If load < 4.4 lbs. (intermittent): +0
If load 4.4 to 22 lbs. (intermittent): +1
If load 4.4 to 22 lbs. (static or repeated): +2
If more than 22 lbs. or repeated or shocks: +3

Step 15: Find Column in Table C
Add values from steps 12-14 to obtain Neck, Trunk and Leg Score. Find Column in Table C.

Scores

Table A

Upper Arm	Lower Arm	Wrist Score							
		Wrist Twist	Wrist Twist	Wrist Twist	Wrist Twist				
1	1	1	2	2	2	3	3	3	3
1	2	2	2	2	2	3	3	3	3
1	3	2	3	3	3	3	3	4	4
1	4	1	2	3	3	3	4	4	4
2	1	2	3	3	3	3	4	4	4
2	2	3	3	3	3	3	4	4	4
2	3	3	4	4	4	4	4	5	5
2	4	1	3	3	4	4	4	4	5
3	1	2	3	4	4	4	4	4	5
3	2	3	4	4	4	4	4	5	5
3	3	4	4	4	4	4	4	5	5
3	4	4	4	4	4	4	4	5	5
4	1	4	4	4	4	4	4	5	5
4	2	4	4	4	4	4	4	5	5
4	3	4	4	4	4	4	4	5	5
4	4	4	4	4	4	4	4	5	5
5	1	5	5	5	5	5	5	6	6
5	2	5	5	5	5	5	5	6	6
5	3	6	6	6	6	6	6	7	7
5	4	6	6	6	6	6	6	7	7
6	1	7	7	7	7	7	7	8	8
6	2	7	7	7	7	7	7	8	8
6	3	8	8	8	8	8	8	9	9
6	4	8	8	8	8	8	8	9	9

Table B: Neck, Trunk, Leg Score

Neck Posture Score	Trunk Posture Score					
	1	2	3	4	5	6
1	1	2	1	2	1	2
2	1	2	3	3	4	5
3	1	2	3	4	5	6
4	1	2	3	4	5	6
5	1	2	3	4	5	6
6	1	2	3	4	5	6

Table C

Wrist / Arm Score	Neck, Trunk, Leg Score					
	1	2	3	4	5	6
1	1	2	3	3	4	5
2	2	2	3	4	4	5
3	3	3	3	4	4	5
4	4	3	3	4	5	6
5	4	4	4	5	6	7
6	4	4	5	6	6	7
7	5	5	6	6	7	7
8	5	5	6	7	7	7

Scoring: (final score from Table C)
1-2 = acceptable posture
3-4 = further investigation, change may be needed
5-6 = further investigation, change soon
7 = investigate and implement change

Final Scores:
Upper Arm Score: 3
Lower Arm Score: 3
Wrist Twist Score: 1
Wrist Score: 3
Posture Score A: 4
Muscle Use Score: 1
Force / Load Score: 2
Wrist & Arm Score: 7
Neck Score: 4
Trunk Score: 4
Leg Score: 2
Posture B Score: 7
Muscle Use Score: 1
Force / Load Score: 2
Neck, Trunk, Leg Score: 10
RULA Score: 7

Original Worksheet Developed by Dr. Alan Hedge. Based on RULA, a survey method for the investigation of work-related upper limb disorders. McAtamney & Corlett, Applied Ergonomics 1993, 24(2), 91-99

Lampiran 7. Penilaian RULA EKA

ERGONOMICS PLUS

RULA Employee Assessment Worksheet

Task Name: Eka

A. Arm and Wrist Analysis

Step 1: Locate Upper Arm Position:

Step 1a: Adjust...
 If shoulder is raised: +1
 If upper arm is abducted: +1
 If arm is supported or person is leaning: -1

Step 2: Locate Lower Arm Position:

Step 2a: Adjust...
 If either arm is working across midline or out to side of body: Add +1

Step 3: Locate Wrist Position:

Step 3a: Adjust...
 If wrist is bent from midline: Add +1

Step 4: Wrist Twist:
 If wrist is twisted in mid-range: +1
 If wrist is at or near end of range: +2

Step 5: Look-up Posture Score in Table A:
 Using values from steps 1-4 above, locate score in Table A

Step 6: Add Muscle Use Score
 If posture mainly static (i.e. held >10 minutes),
 Or if action repeated occurs 4X per minute: +1

Step 7: Add Force/Load Score
 If load < 4.4 lbs. (intermittent): +0
 If load 4.4 to 22 lbs. (intermittent): +1
 If load 4.4 to 22 lbs. (static or repeated): +2
 If more than 22 lbs. or repeated or shocks: +3

Step 8: Find Row in Table C
 Add values from steps 5-7 to obtain Wrist and Arm Score. Find row in Table C.

Scores

Table A		Wrist Score					
		1		2		3	
Upper Arm	Lower Arm	Wrist	Wrist	Wrist	Wrist	Wrist	Wrist
1	1	1	2	2	2	3	3
	2	2	2	2	3	3	3
	3	2	3	3	3	3	4
	4	2	3	3	3	4	4
	5	3	3	3	4	4	5
	6	3	4	4	4	4	5
2	1	1	2	2	2	3	3
	2	2	2	2	3	3	3
	3	2	3	3	3	3	4
	4	2	3	3	3	4	4
	5	3	3	3	4	4	5
	6	3	4	4	4	4	5
3	1	1	2	2	2	3	3
	2	2	2	2	3	3	3
	3	2	3	3	3	3	4
	4	2	3	3	3	4	4
	5	3	3	3	4	4	5
	6	3	4	4	4	4	5
4	1	1	2	2	2	3	3
	2	2	2	2	3	3	3
	3	2	3	3	3	3	4
	4	2	3	3	3	4	4
	5	3	3	3	4	4	5
	6	3	4	4	4	4	5
5	1	1	2	2	2	3	3
	2	2	2	2	3	3	3
	3	2	3	3	3	3	4
	4	2	3	3	3	4	4
	5	3	3	3	4	4	5
	6	3	4	4	4	4	5
6	1	1	2	2	2	3	3
	2	2	2	2	3	3	3
	3	2	3	3	3	3	4
	4	2	3	3	3	4	4
	5	3	3	3	4	4	5
	6	3	4	4	4	4	5

Table C		Neck, Trunk, Leg Score					
		1	2	3	4	5	6
Wrist / Arm Score	1	1	2	3	3	4	5
	2	2	2	3	4	4	5
	3	3	3	3	4	4	5
	4	4	3	3	4	5	6
	5	4	4	4	5	6	7
	6	4	4	5	6	6	7
Posture Score A	1	1	2	3	3	4	5
	2	2	2	3	4	4	5
	3	3	3	3	4	4	5
	4	4	3	3	4	5	6
	5	4	4	4	5	6	7
	6	4	4	5	6	6	7
Muscle Use Score	1	1	2	3	3	4	5
	2	2	2	3	4	4	5
	3	3					

Lampiran 8. Penilaian RULA Ridwan

ERGONOMICS PLUS RULA Employee Assessment Worksheet

Task Name: Ridwan Date: _____

A. Arm and Wrist Analysis

Step 1: Locate Upper Arm Position:

Step 1a: Adjust...
 If shoulder is raised: +1
 If upper arm is abducted: +1
 If arm is supported or person is leaning: -1

Step 2: Locate Lower Arm Position:

Step 2a: Adjust...
 If either arm is working across midline or out to side of body: Add +1

Step 3: Locate Wrist Position:

Step 3a: Adjust...
 If wrist is bent from midline: Add +1

Step 4: Wrist Twist:
 If wrist is twisted in mid-range: +1
 If wrist is at or near end of range: +2

Step 5: Look-up Posture Score in Table A:
 Using values from steps 1-4 above, locate score in Table A

Step 6: Add Muscle Use Score
 If posture mainly static (i.e. held > 10 minutes): +0
 Or if action repeated occurs 4X per minute: +1

Step 7: Add Force/Load Score
 If load < 4.4 lbs. (intermittent): +0
 If load 4.4 to 22 lbs. (intermittent): +1
 If load 4.4 to 22 lbs. (static or repeated): +2
 If more than 22 lbs. or repeated or shocks: +3

Step 8: Find Row in Table C
 Add values from steps 5-7 to obtain Wrist and Arm Score. Find row in Table C.

B. Neck, Trunk and Leg Analysis

Step 9: Locate Neck Position:

Step 9a: Adjust...
 If neck is twisted: +1
 If neck is side bending: +1

Step 10: Locate Trunk Position:

Step 10a: Adjust...
 If trunk is twisted: +1
 If trunk is side bending: +1

Step 11: Legs:
 If legs and feet are supported: +1
 If not: +2

Step 12: Look-up Posture Score in Table B:
 Using values from steps 9-11 above, locate score in Table B

Step 13: Add Muscle Use Score
 If posture mainly static (i.e. held > 10 minutes): +0
 Or if action repeated occurs 4X per minute: +1

Step 14: Add Force/Load Score
 If load < 4.4 lbs. (intermittent): +0
 If load 4.4 to 22 lbs. (intermittent): +1
 If load 4.4 to 22 lbs. (static or repeated): +2
 If more than 22 lbs. or repeated or shocks: +3

Step 15: Find Column in Table C
 Add values from steps 12-14 to obtain Neck, Trunk and Leg Score. Find Column in Table C.

Scores

Table A: Upper Arm / Lower Arm

	Upper Arm	Lower Arm	Wrist Score				
			1	2	3	4	
1	1	1	2	2	2	3	3
2	2	2	2	2	2	3	3
3	3	2	3	3	3	3	4
4	1	2	3	3	3	3	4
5	2	3	3	3	3	4	4
6	3	3	3	3	3	4	4
7	4	4	4	4	4	5	5
8	5	4	4	4	4	5	5
9	6	5	4	4	4	5	5
10	7	6	5	5	5	6	6
11	8	7	6	6	6	7	7
12	9	8	7	7	7	8	8
13	10	9	8	8	8	9	9
14	11	10	9	9	9	10	10
15	12	11	10	10	10	11	11
16	13	12	11	11	11	12	12
17	14	13	12	12	12	13	13
18	15	14	13	13	13	14	14
19	16	15	14	14	14	15	15
20	17	16	15	15	15	16	16
21	18	17	16	16	16	17	17
22	19	18	17	17	17	18	18
23	20	19	18	18	18	19	19
24	21	20	19	19	19	20	20
25	22	21	20	20	20	21	21
26	23	22	21	21	21	22	22
27	24	23	22	22	22	23	23
28	25	24	23	23	23	24	24
29	26	25	24	24	24	25	25
30	27	26	25	25	25	26	26
31	28	27	26	26	26	27	27
32	29	28	27	27	27	28	28
33	30	29	28	28	28	29	29
34	31	30	29	29	29	30	30
35	32	31	30	30	30	31	31
36	33	32	31	31	31	32	32
37	34	33	32	32	32	33	33
38	35	34	33	33	33	34	34
39	36	35	34	34	34	35	35
40	37	36	35	35	35	36	36
41	38	37	36	36	36	37	37
42	39	38	37	37	37	38	38
43	40	39	38	38	38	39	39
44	41	40	39	39	39	40	40
45	42	41	40	40	40	41	41
46	43	42	41	41	41	42	42
47	44	43	42	42	42	43	43
48	45	44	43	43	43	44	44
49	46	45	44	44	44	45	45
50	47	46	45	45	45	46	46
51	48	47	46	46	46	47	47
52	49	48	47	47	47	48	48
53	50	49	48	48	48	49	49
54	51	50	49	49	49	50	50
55	52	51	50	50	50	51	51
56	53	52	51	51	51	52	52
57	54	53	52	52	52	53	53
58	55	54	53	53	53	54	54
59	56	55	54	54	54	55	55
60	57	56	55	55	55	56	56
61	58	57	56	56	56	57	57
62	59	58	57	57	57	58	58
63	60	59	58	58	58	59	59
64	61	60	59	59	59	60	60
65	62	61	60	60	60	61	61
66	63	62	61	61	61	62	62
67	64	63	62	62	62	63	63
68	65	64	63	63	63	64	64
69	66	65	64	64	64	65	65
70	67	66	65	65	65	66	66
71	68	67	66	66	66	67	67
72	69	68	67	67	67	68	68
73	70	69	68	68	68	69	69
74	71	70	69	69	69	70	70
75	72	71	70	70	70	71	71
76	73	72	71	71	71	72	72
77	74	73	72	72	72	73	73
78	75	74	73	73	73	74	74
79	76	75	74	74	74	75	75
80	77	76	75	75	75	76	76
81	78	77	76	76	76	77	77
82	79	78	77	77	77	78	78
83	80	79	78	78	78	79	79
84	81	80	79	79	79	80	80
85	82	81	80	80	80	81	81
86	83	82	81	81	81	82	82
87	84	83	82	82	82	83	83
88	85	84	83	83	83	84	84
89	86	85	84	84	84	85	85
90	87	86	85	85	85	86	86
91	88	87	86	86	86	87	87
92	89	88	87	87	87	88	88
93	90	89	88	88	88	89	89
94	91	90	89	89	89	90	90
95	92	91	90	90	90	91	91
96	93	92	91	91	91	92	92
97	94	93	92	92	92	93	93
98	95	94	93	93	93	94	94
99	96	95	94	94	94	95	95
100	97	96	95	95	95	96	96
101	98	97	96	96	96	97	97
102	99	98	97	97	97	98	98
103	100	99	98	98	98	99	99
104	101	100	99	99	99	100	100
105	102	101	100	100	100	101	101
106	103	102	101	101	101	102	102
107	104	103	102	102	102	103	103
108	105	104	103	103	103	104	104
109	106	105	104	104	104	105	105
110	107	106	105	105	105	106	106
111	108	107	106	106	106	107	107
112	109	108	107	107	107	108	108
113	110	109	108	108	108	109	109
114	111	110	109	109	109	110	110
115	112	111	110	110	110	111	111
116	113	112	111	111	111	112	112
117	114	113	112	112	112	113	113
118	115	114	113	113	113	114	114
119	116	115	114	114	114	115	115
120	117	116	115	115	115	116	116
121	118	117	116	116	116	117	117
122	119	118	117	117	117	118	118
123	120	119	118	118	118	119	119
124	121	120	119	119	119	120	120
125	122	121	120	120	120	121	121
126	123	122	121	121	121	122	122
127	124	123	122	122	122	123	123
128	125	124	123	123	123	124	124
129	126	125	124	124	124	125	125
130	127	126	125	125	125	126	126
131	128	127	126	126	126	127	127
132	129	128	127	127	127	128	128
133	130	129	128	128	128	129	129
134	131	130	129	129	129	130	130
135	132	131	130	130	130	131	131
136	133	132	131	131	131	132	132
137	134	133	132	132	132	133	133
138	135	134	133	133	133	134	134
139	136	135	134	134	134	135	135
140	137	136	135	135	135	136	136
141	138	137	136	136	136	137	137
142	139	138	137	137	137	138	138
143	140	139	138	138	138	139	139
144	141	140	139	139	139	140	140
145	142	141	140	140	140	141	141
146	143	142	141	141	141	142	142
147	144	143	142	142	142	143	143
148	145	144	143	143	143	144	144
149	146	145	144	144	144	145	145
150	147	146	145	145	145	146	146

Lampiran 9. Penilaian RULA Roki

ERGONOMICS PLUS RULA Employee Assessment Worksheet Task Name: *Roki* Date:

A. Arm and Wrist Analysis

Step 1: Locate Upper Arm Position:

Step 1a: Adjust...
If shoulder is raised: +1
If upper arm is abducted: +1
If arm is supported or person is leaning: -1

Step 2: Locate Lower Arm Position:

Step 2a: Adjust...
If either arm is working across midline or out to side of body: Add +1

Step 3: Locate Wrist Position:

Step 3a: Adjust...
If wrist is bent from midline: Add +1

Step 4: Wrist Twist:

Step 4a: Adjust...
If wrist is twisted in mid-range: +1
If wrist is at or near end of range: +2

Step 5: Look-up Posture Score in Table A:
Using values from steps 1-4 above, locate score in Table A

Step 6: Add Muscle Use Score
If posture mainly static (i.e. held >10 minutes), Or if action repeated occurs 4X per minute: +1

Step 7: Add Force/Load Score
If load < 4.4 lbs. (intermittent): +0
If load 4.4 to 22 lbs. (intermittent): +1
If load 4.4 to 22 lbs. (static or repeated): +2
If more than 22 lbs. or repeated or shocks: +3

Step 8: Find Row in Table C
Add values from steps 5-7 to obtain Wrist and Arm Score, Find row in Table C.

B. Neck, Trunk and Leg Analysis

Step 9: Locate Neck Position:

Step 9a: Adjust...
If neck is twisted: +1
If neck is side bending: +1

Step 10: Locate Trunk Position:

Step 10a: Adjust...
If trunk is twisted: +1
If trunk is side bending: +1

Step 11: Legs:
If legs and feet are supported: +1
If not: +2

Step 12: Look-up Posture Score in Table B:
Using values from steps 9-11 above, locate score in Table B

Step 13: Add Muscle Use Score
If posture mainly static (i.e. held >10 minutes), Or if action repeated occurs 4X per minute: +1

Step 14: Add Force/Load Score
If load < 4.4 lbs. (intermittent): +0
If load 4.4 to 22 lbs. (intermittent): +1
If load 4.4 to 22 lbs. (static or repeated): +2
If more than 22 lbs. or repeated or shocks: +3

Step 15: Find Column in Table C
Add values from steps 12-14 to obtain Neck, Trunk and Leg Score, Find Column in Table C.

Scores

Table A: Wrist Score

Upper Arm	Lower Arm	Wrist Twist	Wrist Twist	Wrist Twist	Wrist Twist
1	1	1	2	3	4
2	2	2	3	4	5
3	3	3	4	5	6
4	4	4	5	6	7
5	5	5	6	7	8
6	6	6	7	8	9

Table B: Trunk Posture Score

Neck	Legs	Legs	Legs	Legs	Legs
1	1	2	3	4	5
2	2	3	4	5	6
3	3	4	5	6	7
4	4	5	6	7	8
5	5	6	7	8	9
6	6	7	8	9	10

Table C: Neck, Trunk, Leg Score

Neck	Trunk	Leg	Score
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
10	10	10	10

Scoring: (final score from Table C)
1-2 = acceptable posture
3-4 = further investigation, change may be needed
5-6 = further investigation, change soon
7 = investigate and implement change

Final Scores:
Upper Arm Score: 3
Lower Arm Score: 3
Wrist Twist Score: 1
Wrist Score: 5
Posture Score A: 4
Muscle Use Score: 1
Force / Load Score: 2
Wrist & Arm Score: 7
Neck Score: 4
Trunk Score: 4
Leg Score: 2
Posture B Score: 7
Muscle Use Score: 1
Force / Load Score: 2
Neck, Trunk, Leg Score: 10
RULA Score: 7

ERGONOMICS PLUS is a registered trademark of Alan Hedge. Based on RULA: a survey method for the investigation of work-related upper limb disorders. McAtamney & Corlett, Applied Ergonomics 1993, 24(2), 91-99

Lampiran 10. Penilaian RULA Wisnu

ERGONOMICS PLUS RULA Employee Assessment Worksheet Task Name: Wisnu Date: _____

A. Arm and Wrist Analysis

Step 1: Locate Upper Arm Position:

Step 1a: Adjust...
If shoulder is raised: +1
If upper arm is abducted: +1
If arm is supported or person is leaning: -1

Step 2: Locate Lower Arm Position:

Step 2a: Adjust...
If either arm is working across midline or out to side of body: Add +1

Step 3: Locate Wrist Position:

Step 3a: Adjust...
If wrist is bent from midline: Add +1

Step 4: Wrist Twist:
If wrist is twisted in mid-range: +1
If wrist is at or near end of range: +2

Step 5: Look-up Posture Score in Table A:
Using values from steps 1-4 above, locate score in Table A

Step 6: Add Muscle Use Score
If posture mainly static (i.e. held >10 minutes): +0
Or if action repeated occurs 4X per minute: +1

Step 7: Add Force/Load Score
If load < 4.4 lbs. (intermittent): +0
If load 4.4 to 22 lbs. (intermittent): +1
If load 4.4 to 22 lbs. (static or repeated): +2
If more than 22 lbs. or repeated or shocks: +3

Step 8: Find Row in Table C
Add values from steps 5-7 to obtain Wrist and Arm Score. Find row in Table C.

B. Neck, Trunk and Leg Analysis

Step 9: Locate Neck Position:

Step 9a: Adjust...
If neck is twisted: +1
If neck is side bending: +1

Step 10: Locate Trunk Position:

Step 10a: Adjust...
If trunk is twisted: +1
If trunk is side bending: +1

Step 11: Legs:
If legs and feet are supported: +1
If not: +2

Step 12: Look-up Posture Score in Table B:
Using values from steps 9-11 above, locate score in Table B

Step 13: Add Muscle Use Score
If posture mainly static (i.e. held >10 minutes): +0
Or if action repeated occurs 4X per minute: +1

Step 14: Add Force/Load Score
If load < 4.4 lbs. (intermittent): +0
If load 4.4 to 22 lbs. (intermittent): +1
If load 4.4 to 22 lbs. (static or repeated): +2
If more than 22 lbs. or repeated or shocks: +3

Step 15: Find Column in Table C
Add values from steps 12-14 to obtain Neck, Trunk and Leg Score. Find Column in Table C.

Scoring (final score from Table C)

1-2 = acceptable posture
3-4 = further investigation, change may be needed
5-6 = further investigation, change soon
7 = investigate and implement change

Table A: Upper Arm / Lower Arm

	Upper Arm	Lower Arm	Wrist Score				
			Wrist Twist	Wrist Twist	Wrist Twist	Wrist Twist	
1	1	1	2	2	2	3	3
2	2	2	2	2	2	3	3
3	3	3	3	3	3	4	4
4	4	4	4	4	4	5	5
5	5	5	5	5	5	6	6
6	6	6	6	6	6	7	7

Table B: Neck Posture Score

Neck Posture Score	Legs					
	1	2	3	4	5	6
1	1	2	3	4	5	6
2	2	3	4	5	6	7
3	3	4	5	6	7	8
4	4	5	6	7	8	9
5	5	6	7	8	9	10
6	6	7	8	9	10	11

Table C: Neck, Trunk, Leg Score

Neck, Trunk, Leg Score	Neck, Trunk, Leg Score					
	1	2	3	4	5	6
1	1	2	3	4	5	6
2	2	3	4	5	6	7
3	3	4	5	6	7	8
4	4	5	6	7	8	9
5	5	6	7	8	9	10
6	6	7	8	9	10	11
7	7	8	9	10	11	12
8	8	9	10	11	12	13

Final Scores:

- Upper Arm Score: **4**
- Lower Arm Score: **3**
- Wrist Twist Score: **2**
- Wrist Score: **4**
- Posture Score A: **6**
- Muscle Use Score: **1**
- Force / Load Score: **1**
- Wrist & Arm Score: **8**
- Neck Score: **3**
- Trunk Score: **4**
- Leg Score: **2**
- Posture B Score: **6**
- Muscle Use Score: **1**
- Force / Load Score: **1**
- Neck, Trunk, Leg Score: **8**
- RULA Score: **7**

Original Worksheet Developed by Dr. Alan Hedge. Based on RULA: a survey method for the investigation of work-related upper limb disorders. McAtamney & Corlett, Applied Ergonomics 1993, 24(2), 91-99.

Lampiran 11. Instruksi Perbaikan Postur Kerja

INSTRUKSI PERBAIKAN POSTUR KERJA

Dibuat oleh: I Wayan Angga Saputra

Instruksi perbaikan postur kerja saat pencetakan dan *finishing* karbon dilakukan dengan cara sebagai berikut:

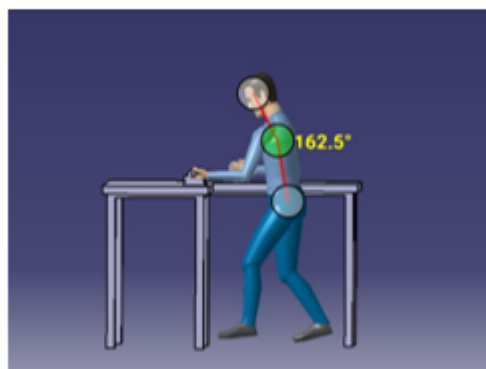
- Berdiri tegak dengan punggung tidak membungkuk lebih dari 20° .
- Postur tubuh netral dan seimbang dengan tumpuan kedua kaki sejajar bahu.
- Leher tegak dengan tidak menunduk lebih dari 20° .
- Postur leher netral sejajar dengan punggung.
- Postur lengan menekuk 90° pada posisi dekat tubuh.
- Pandangan mengarah ke alat dan objek kerja.

Ilustrasi Postur Tubuh Pekerja



Pekerja tidak membungkuk lebih dari 20°

Ilustrasi Postur Leher Pekerja



Pekerja tidak menunduk lebih dari 20°