APPENDIX - A

Current State Map

Activity-Therblig relationship (ATR)

	SO	L	CFS	SR	XF	YF	ZF	TS	TC	C
1	1	1	0	0	0	0	0	0	0	0
2	1	1	0	1	0	0	0	0	0	0
3	1	1	1	1	0	0	0	0	0	0
4	1	1	1	1	0	0	1	0	0	0
5	1	1	1	1	1	1	0	0	0	0
6	1	1	1	1	0	1	0	0	0	0
7	1	1	1	1	0	0	1	0	0	0
8	1	1	1	1	0	0	1	0	0	0
9	1	1	1	1	1	0	0	0	0	1
10	1	1	1	1	0	1	0	0	0	0
11	1	1	1	1	1	0	0	0	0	1
12	1	1	1	1	0	1	0	0	0	0
13	1	1	1	1	1	0	0	0	0	1
14	1	1	1	1	0	1	0	0	0	0
15	1	1	1	1	1	0	0	0	0	1
16	1	1	1	1	0	1	0	0	0	0
17	1	1	1	1	1	0	0	0	0	1
18	1	1	1	1	0	1	0	0	0	0
19	1	1	1	1	1	0	0	0	0	1
20	1	1	1	1	0	1	0	0	0	0
21	1	1	1	1	1	0	0	0	0	1
22	1	1	1	1	0	1	0	0	0	0
23	1	1	1	1	1	0	0	0	0	1
24	1	1	1	1	0	1	0	0	0	0
25	1	1	1	1	1	0	0	0	0	1
26	1	1	1	1	0	1	0	0	0	0
27	1	1	1	1	1	0	0	0	0	1
28	1	1	1	1	0	0	1	0	0	0
29	1	1	0	1	0	0	0	0	0	0
30	1	1	0	1	0	0	1	0	0	0
31	1	1	0	1	1	1	0	0	0	0
32	1	1	0	1	1	0	0	0	0	0
33	1	1	0	0	0	0	0	0	0	0
34	1	1	0	0	0	0	0	1	0	0
35	1	1	0	0	0	0	0	0	1	0
36	1	1	0	1	0	0	0	0	0	0
37	1	1	1	1	0	0	0	0	0	0
38	1	1	1	1	0	0	1	0	0	0
39	1	1	1	1	1	1	0	0	0	0
40	1	1	1	1	1	0	0	0	0	0
41	1	1	1	1	0	0	1	0	0	1
42	1	1	1	1	0	0	1	0	0	0
43	1	1	1	1	0	0	1	0	0	0
44	1	1	0	1	0	0	0	0	0	0
45	1	1	0	1	0	0	1	0	0	0
46	1	1	0	1	1	1	0	0	0	0
47	1	1	0	1	1	0	0	0	0	0
48	1	1	0	0	0	0	0	0	0	0
49	1	1	0	0	0	0	0	1	0	0
50	1	1	0	0	0	0	0	0	1	0
51	1	1	0	1	0	0	0	0	0	0
52	1	1	1	1	0	0	0	0	0	0
53	1	1	1	1	0	0	1	0	0	0
54	1	1	1	1	1	1	0	0	0	0
55	1	1	1	1	1	0	0	0	0	0
56	1	1	1	1	0	0	1	0	0	0
57	1	1	1	1	0	0	1	0	0	1
58	1	1	1	1	0	1	0	0	0	1
59	1	1	1	1	1	0	0	0	0	1
60	1	1	1	1	1	1	0	0	0	1
61	1	1	1	1	1	0	0	0	0	1

Therblig power (TP)

	SO	L	CFS	SR	XF	YF	ZF	TS	TC	C
1	0.5	0.03	0	0	0	0	0	0	0	0
2	0.5	0.03	0	0.33	0	0	0	0	0	0
3	0.5	0.03	1.1	0.33	0	0	0	0	0	0
4	0.5	0.03	1.1	0.33	0	0	1.14	0	0	0
5	0.5	0.03	1.1	0.33	0.36	0.36	0	0	0	0
6	0.5	0.03	1.1	0.33	0	0.36	0	0	0	0
7	0.5	0.03	1.1	0.33	0	0	1.14	0	0	0
8	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
9	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.15
10	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
11	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.15
12	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
13	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.15
14	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
15	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.15
16	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
17	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.15
18	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
19	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.15
20	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
21	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.15
22	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
23	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.15
24	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
25	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.15
26	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
27	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.15
28	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
29	0.5	0.03	0	0.33	0	0	0	0	0	0
30	0.5	0.03	0	0.33	0	0	1.14	0	0	0
31	0.5	0.03	0	0.33	0.36	0.36	0	0	0	0
32	0.5	0.03	0	0.33	0.36	0	0	0	0	0
33	0.5	0.03	0	0	0	0	0	0	0	0
34	0.5	0.03	0	0	0	0	0	0.18	0	0
35	0.5	0.03	0	0	0	0	0	0	0.25	0
36	0.5	0.03	0	0.25	0	0	0	0	0	0
37	0.5	0.03	1.1	0.25	0	0	0	0	0	0
38	0.5	0.03	1.1	0.25	0	0	1.14	0	0	0
39	0.5	0.03	1.1	0.25	0.36	0.36	0	0	0	0
40	0.5	0.03	1.1	0.25	0.36	0	0	0	0	0
41	0.5	0.03	1.1	0.25	0	0	0.09	0	0	0.19
42	0.5	0.03	1.1	0.25	0	0	0.09	0	0	0
43	0.5	0.03	1.1	0.25	0	0	1.14	0	0	0
44	0.5	0.03	0	0.25	0	0	0	0	0	0
45	0.5	0.03	0	0.25	0	0	1.14	0	0	0
46	0.5	0.03	0	0.25	0.36	0.36	0	0	0	0
47	0.5	0.03	0	0.25	0.36	0	0	0	0	0
48	0.5	0.03	0	0	0	0	0	0	0	0
49	0.5	0.03	0	0	0	0	0	0.18	0	0
50	0.5	0.03	0	0	0	0	0	0	0.25	0
51	0.5	0.03	0	0.33	0	0	0	0	0	0
52	0.5	0.03	1.1	0.33	0	0	0	0	0	0
53	0.5	0.03	1.1	0.33	0	0	1.14	0	0	0
54	0.5	0.03	1.1	0.33	0.36	0.36	0	0	0	0
55	0.5	0.03	1.1	0.33	0.36	0	0	0	0	0
56	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
57	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.14
58	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
59	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
60	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.03
61	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03

62	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.03
63	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
64	1	1	1	1	0	1	0	0	0	0		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
65	1	1	1	1	0	0	1	0	0	1		0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.14
66	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
67	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
68	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.03
69	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
70	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.03
71	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
72	1	1	1	1	0	1	0	0	0	0		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
73	1	1	1	1	0	0	1	0	0	1		0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.14
74	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
75	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
76	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.03
77	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
78	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.03
79	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
80	1	1	1	1	0	1	0	0	0	0		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
81	1	1	1	1	0	0	1	0	0	1		0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.14
82	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
83	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
84	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.03
85	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
86	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.03
87	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
88	1	1	1	1	0	1	0	0	0	0		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
89	1	1	1	1	0	0	1	0	0	0		0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
90	1	1	1	1	0	0	1	0	0	0		0.5	0.03	1.1	0.33	0	0	1.14	0	0	0
91	1	1	1	1	1	1	0	0	0	0		0.5	0.03	1.1	0.33	0.36	0.36	0	0	0	0
92	1	1	1	1	1	0	0	0	0	0		0.5	0.03	1.1	0.33	0.36	0	0	0	0	0
93	1	1	1	1	0	0	1	0	0	0		0.5	0.03	1.1	0.33	0	0	0.04	0	0	0
94	1	1	1	1	0	0	1	0	0	0		0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
95	1	1	1	1	0	1	0	0	0	0		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
96	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.06
97	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.06
98	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.06
99	1	1	1	1	0	1	0	0	0	0		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
100	1	1	1	1	0	0	1	0	0	0		0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
101	1	1	1	1	0	1	0	0	0	0		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
102	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.06
103	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.06
104	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.06
105	1	1	1	1	0	1	0	0	0	0		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
106	1	1	1	1	0	0	1	0	0	0		0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
107	1	1	1	1	0	1	0	0	0	0		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
108	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.06
109	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.06
110	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.06
111	1	1	1	1	0	1	0	0	0	0		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
112	1	1	1	1	0	0	1	0	0	0		0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
113	1	1	1	1	0	0	1	0	0	0		0.5	0.03	1.1	0.33	0	0	1.14	0	0	0
114	1	1	1	1	1	0	0	0	0	0		0.5	0.03	1.1	0.33	0.36	0	0	0	0	0
115	1	1	1	1	0	0	1	0	0	0		0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
116	1	1	1	1	0	0	1	0	0	1		0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.14
117	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
118	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
119	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
120	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
121	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
122	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
123	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
124	1	1	1	1	0	0	1	0	0	1		0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.14
125	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
126	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
127	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
128	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03

129	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
130	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
131	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
132	1	1	1	1	0	0	1	0	0	1		0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.14
133	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
134	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
135	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
136	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
137	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
138	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
139	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
140	1	1	1	1	0	0	1	0	0	1		0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.14
141	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
142	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
143	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
144	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
145	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
146	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
147	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
148	1	1	1	1	0	0	1	0	0	1		0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.14
149	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
150	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
151	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
152	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
153	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
154	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
155	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
156	1	1	1	1	0	0	1	0	0	1		0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.14
157	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
158	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
159	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
160	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
161	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
162	1	1	1	1	0	1	0	0	0	1		0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
163	1	1	1	1	1	0	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
164	1	1	1	1	0	0	1	0	0	0		0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
165	1	1	1	1	0	0	1	0	0	0		0.5	0.03	1.1	0.33	0	0	1.14	0	0	0
166	1	1	0	1	0	0	0	0	0	0		0.5	0.03	0	0.33	0	0	0	0	0	0
167	1	1	0	1	0	0	1	0	0	0		0.5	0.03	0	0.33	0	0	1.14	0	0	0
168	1	1	0	1	1	1	0	0	0	0		0.5	0.03	0	0.33	0.36	0.36	0	0	0	0
169	1	1	0	1	1	0	0	0	0	0		0.5	0.03	0	0.33	0.36	0	0	0	0	0
170	1	1	0	0	0	0	0	0	0	0		0.5	0.03	0	0	0	0	0	0	0	0
171	1	1	0	0	0	0	0	1	0	0		0.5	0.03	0	0	0	0	0	0.18	0	0
172	1	1	0	0	0	0	0	0	1	0		0.5	0.03	0	0	0	0	0	0	0.25	0
173	1	1	0	1	0	0	0	0	0	0		0.5	0.03	0	0.33	0	0	0	0	0	0
174	1	1	1	1	0	0	0	0	0	0		0.5	0.03	1.1	0.33	0	0	0	0	0	0
175	1	1	1	1	1	1	0	0	0	0		0.5	0.03	1.1	0.33	0.36	0.36	0	0	0	0
176	1	1	1	1	1	0	0	0	0	0		0.5	0.03	1.1	0.33	0.36	0	0	0	0	0
177	1	1	1	1	0	0	1	0	0	0		0.5	0.03	1.1	0.33	0	0	1.14	0	0	0
178	1	1	1	1	0	0	1	0	0	0		0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
179	1	1	1	1	0	0	1	0	0	1		0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.39
180	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
181	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
182	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
183	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
184	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
185	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
186	1	1	1	1	1	1	0	0	0	0		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0
187	1	1	1	1	0	0	1	0	0	1		0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.39
188	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
189	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
190	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
191	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
192	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
193	1	1	1	1	1	1	0	0	0	1		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
194	1	1	1	1	1	1	0	0	0	0		0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0
195	1	1	1	1	0	0	1	0	0	1		0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.39

196	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
197	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
198	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
199	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
200	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
201	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
202	1	1	1	1	1	1	0	0	0	0	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0
203	1	1	1	1	0	0	1	0	0	1	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.39
204	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
205	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
206	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
207	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
208	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
209	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
210	1	1	1	1	1	1	0	0	0	0	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0
211	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
212	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.33	0	0	1.14	0	0	0
213	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.33	0	0	1.14	0	0	0
214	1	1	0	1	0	0	0	0	0	0	0.5	0.03	0	0.33	0	0	0	0	0	0
215	1	1	0	0	0	0	0	0	0	0	0.5	0.03	0	0	0	0	0	0	0	0

Future State Map

	Activity-Therblig relationship (ATR)										Therblig power (TP)									
	SO	L	CFS	SR	XF	YF	ZF	TS	TC	C	SO	L	CFS	SR	XF	YF	ZF	TS	TC	C
1	1	1	0	0	0	0	0	0	0	0	0.5	0.03	0	0	0	0	0	0	0	0
2	1	1	0	0	0	0	1	0	0	0	0.5	0.03	0	0	0	0	1.14	0	0	0
3	1	1	0	0	1	1	0	0	0	0	0.5	0.03	0	0	0.36	0.37	0	0	0	0
4	1	1	0	0	0	1		0	0	0	0.5	0.03	0	0	0	0.36		0	0	0
5	1	1	0	0	0	0	1	0	0	0	0.5	0.03	0	0	0	0	1.14	0	0	0
6	1	1	0	1	0	0	0	0	0	0	0.5	0.03	0	0.33	0	0	0	0	0	0
7	1	1	1	1	0	0	0	0	0	0	0.5	0.03	1.1	0.33	0	0	0	0	0	0
8	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
9	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.15
10	1	1	1	1	0	1	0	0	0	0	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
11	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.15
12	1	1	1	1	0	1	0	0	0	0	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
13	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.15
14	1	1	1	1	0	1	0	0	0	0	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
15	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.15
16	1	1	1	1	0	1	0	0	0	0	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
17	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.15
18	1	1	1	1	0	1	0	0	0	0	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
19	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.15
20	1	1	1	1	0	1	0	0	0	0	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
21	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.15
22	1	1	1	1	0	1	0	0	0	0	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
23	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.15
24	1	1	1	1	0	1	0	0	0	0	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
25	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.15
26	1	1	1	1	0	1	0	0	0	0	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
27	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.15
28	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
29	1	1	0	1	0	0	0	0	0	0	0.5	0.03	0	0.33	0	0	0	0	0	0
30	1	1	0	0	0	0	0	0	0	0	0.5	0.03	0	0	0	0	0	0	0	0
31	1	1	0	0	0	0	1	0	0	0	0.5	0.03	0	0	0	0	1.14	0	0	0
32	1	1	0	0	0	0	0	1	0	0	0.5	0.03	0	0	0	0	0	0.18	0	0
33	1	1	0	0	0	0	0	0	1	0	0.5	0.03	0	0	0	0	0	0	0.25	0
34	1	1	0	0	0	0	1	0	0	0	0.5	0.03	0	0	0	0	1.14	0	0	0

35	1	1	0	0	1	1	0	0	0	0	0.5	0.03	0	0	0.36	0.36	0	0	0	0
36	1	1	0	0	1	0	0	0	0	0	0.5	0.03	0	0	0.36	0	0	0	0	0
37	1	1	0	1	0	0	0	0	0	0	0.5	0.03	0	0.25	0	0	0	0	0	0
38	1	1	1	1	0	0	0	0	0	0	0.5	0.03	1.1	0.25	0	0	0	0	0	0
39	1	1	1	1	0	0	1	0	0	1	0.5	0.03	1.1	0.25	0	0	0.09	0	0	0.19
40	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.25	0	0	0.09	0	0	0
41	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.25	0	0	1.14	0	0	0
42	1	1	0	1	0	0	0	0	0	0	0.5	0.03	0	0.25	0	0	0	0	0	0
43	1	1	0	0	0	0	0	0	0	0	0.5	0.03	0	0	0	0	0	0	0	0
44	1	1	0	1	0	0	1	0	0	0	0.5	0.03	0	0.25	0	0	1.14	0	0	0
45	1	1	0	0	0	0	0	1	0	0	0.5	0.03	0	0	0	0	0	0.18	0	0
46	1	1	0	0	0	0	0	0	1	0	0.5	0.03	0	0	0	0	0	0	0.25	0
47	1	1	0	0	0	0	1	0	0	0	0.5	0.03	0	0	0	0	1.14	0	0	0
48	1	1	0	0	0	1	0	0	0	0	0.5	0.03	0	0	0	0.36	0	0	0	0
49	1	1	0	1	0	0	0	0	0	0	0.5	0.03	0	0.33	0	0	0	0	0	0
50	1	1	1	1	0	0	0	0	0	0	0.5	0.03	1.1	0.33	0	0	0	0	0	0
51	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
52	1	1	1	1	0	0	1	0	0	1	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.14
53	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
54	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
55	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.03
56	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
57	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.03
58	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
59	1	1	1	1	0	1	0	0	0	0	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
60	1	1	1	1	0	0	1	0	0	1	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.14
61	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
62	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
63	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.03
64	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
65	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.03
66	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
67	1	1	1	1	0	1	0	0	0	0	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
68	1	1	1	1	0	0	1	0	0	1	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.14
69	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
70	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
71	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.03
72	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
73	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.03
74	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
75	1	1	1	1	0	1	0	0	0	0	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
76	1	1	1	1	0	0	1	0	0	1	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.14
77	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
78	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
79	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.03
80	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
81	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.03
82	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
83	1	1	1	1	0	1	0	0	0	0	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
84	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
85	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.33	0	0	1.14	0	0	0
86	1	1	1	1	1	1	0	0	0	0	0.5	0.03	1.1	0.33	0.36	0.36	0	0	0	0
87	1	1	1	1	1	0	0	0	0	0	0.5	0.03	1.1	0.33	0.36	0	0	0	0	0
88	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
89	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
90	1	1	1	1	0	1	0	0	0	0	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
91	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.06
92	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.06

93	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.06
94	1	1	1	1	0	1	0	0	0	0	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
95	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
96	1	1	1	1	0	1	0	0	0	0	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
97	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.06
98	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.06
99	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.06
100	1	1	1	1	0	1	0	0	0	0	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
101	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
102	1	1	1	1	0	1	0	0	0	0	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
103	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.06
104	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.06
105	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.06
106	1	1	1	1	0	1	0	0	0	0	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0
107	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
108	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.33	0	0	1.14	0	0	0
109	1	1	1	1	1	0	0	0	0	0	0.5	0.03	1.1	0.33	0.36	0	0	0	0	0
110	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
111	1	1	1	1	0	0	1	0	0	1	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.14
112	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
113	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
114	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
115	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
116	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
117	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
118	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
119	1	1	1	1	0	0	1	0	0	1	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.14
120	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
121	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
122	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
123	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
124	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
125	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
126	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
127	1	1	1	1	0	0	1	0	0	1	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.14
128	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
129	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
130	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
131	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
132	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
133	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
134	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
135	1	1	1	1	0	0	1	0	0	1	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.14
136	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
137	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
138	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
139	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
140	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
141	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
142	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
143	1	1	1	1	0	0	1	0	0	1	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.14
144	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
145	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
146	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
147	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
148	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
149	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
150	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03

151	1	1	1	1	0	0	1	0	0	1	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.14
152	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
153	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
154	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
155	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
156	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
157	1	1	1	1	0	1	0	0	0	1	0.5	0.03	1.1	0.33	0	0.04	0	0	0	0.03
158	1	1	1	1	1	0	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0	0	0	0	0.03
159	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
160	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.33	0	0	1.14	0	0	0
161	1	1	0	1	0	0	0	0	0	0	0.5	0.03	0	0.33	0	0	0	0	0	0
162	1	1	0	0	0	0	0	0	0	0	0.5	0.03	0	0	0	0	0	0	0	0
163	1	1	0	0	0	0	1	0	0	0	0.5	0.03	0	0	0	0	1.14	0	0	0
164	1	1	0	0	0	0	0	1	0	0	0.5	0.03	0	0	0	0	0	0.18	0	0
165	1	1	0	0	0	0	0	0	1	0	0.5	0.03	0	0	0	0	0	0	0.25	0
166	1	1	0	0	1	1	0	0	0	0	0.5	0.03	0	0	0.36	0.36	0	0	0	0
167	1	1	0	0	1	0	0	0	0	0	0.5	0.03	0	0	0.36	0	0	0	0	0
168	1	1	0	0	0	0	1	0	0	0	0.5	0.03	0	0	0	0	1.14	0	0	0
169	1	1	0	1	0	0	0	0	0	0	0.5	0.03	0	0.33	0	0	0	0	0	0
170	1	1	1	1	0	0	0	0	0	0	0.5	0.03	1.1	0.33	0	0	0	0	0	0
171	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
172	1	1	1	1	0	0	1	0	0	1	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.39
173	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
174	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
175	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
176	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
177	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
178	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
179	1	1	1	1	1	1	0	0	0	0	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0
180	1	1	1	1	0	0	1	0	0	1	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.39
181	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
182	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
183	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
184	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
185	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
186	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
187	1	1	1	1	1	1	0	0	0	0	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0
188	1	1	1	1	0	0	1	0	0	1	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.39
189	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
190	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
191	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
192	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
193	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
194	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
195	1	1	1	1	1	1	0	0	0	0	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0
196	1	1	1	1	0	0	1	0	0	1	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0.39
197	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
198	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
199	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
200	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
201	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
202	1	1	1	1	1	1	0	0	0	1	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0.1
203	1	1	1	1	1	1	0	0	0	0	0.5	0.03	1.1	0.33	0.04	0.04	0	0	0	0
204	1	1	1	1	0	0	1	0	0	0	0.5	0.03	1.1	0.33	0	0	0.09	0	0	0
205	1	1	0	1	0	0	0	0	0	0	0.5	0.03	0	0.33	0	0	0	0	0	0
206	1	1	0	0	0	0	0	0	0	0	0.5	0.03	0	0	0	0	0	0	0	0
207	1	1	0	0	0	0	1	0	0	0	0.5	0.03	0	0	0	0	1.14	0	0	0
208	1	1	0	0	0	0	1	0	0	0	0.5	0.03	0	0	0	0	1.14	0	0	0

APPENDIX - B

Peer – Reviewed International Journal Publications

1. Sihag, N., Sangwan, K. S. (2019). An improved micro analysis-based energy consumption and carbon emissions modeling approach for a milling center. *The International Journal of Advanced Manufacturing Technology*, 1-17.
2. Sihag, N., Sangwan, K. S. (2019). Development of a sustainability assessment index for machine tools. *Procedia CIRP*, 80, 156-161.
3. Sihag, N., Leiden, A., Bhakar, V., Thiede, S., Sangwan, K. S., Herrmann, C. (2019). The Influence of Manufacturing Plant Site Selection on Environmental Impact of Machining Processes. *Procedia CIRP*, 80, 186-191.
4. Sihag, N., Sangwan, K. S. (2018). Development of a multi-criteria optimization model for minimizing carbon emissions and processing time during machining. *Procedia CIRP*, 69, 300-305.
5. Sihag, N., Sangwan, K. S., Pundir, S. (2018). Development of a structured algorithm to identify the status of a machine tool to improve energy and time efficiencies. *Procedia CIRP*, 69, 294-299.

Book Chapter

6. Sihag, N., Sangwan, K. S. (2020). Development of an Electric-Load Intelligence system for component level disaggregation to improve energy efficiency of machine tools. In Eds Kuldip Singh Sangwan, Christoph Herrmann. *Enhancing future Skills and Entrepreneurship*, Springer Nature book series, Heidelberg. (accepted)

Working Papers

7. A systematic literature review on machining energy: classification, modelling, saving strategies and evaluation measures
8. Energy efficient machining with high productivity and surface quality: a case study