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**Appendix 1: Frequency Multiplier Table (FM)** 

Frequency						
Lifts/min	≤11	lour	>1 but≤	2 Hours	>2 but <	8 Hours
(F) ‡	V < 30†	V ≥ 30	V < 30	V≥30	V < 30	V ≥ 30
≤0.2	1.00	1.00	.95	.95	.85	.85
0.5	.97	.97	.92	.92	.81	.81
1	.94	.94	.88	.88	.75	.75
2	.91	.91	.84	.84	.65	.65
3	.88	.88	.79	.79	.55	.55
4	.84	.84	.72	.72	.45	.45
5	.80	.80	.60	.60	.35	.35
6	.75	.75	.50	.50	.27	.27
7	.70	.70	.42	.42	.22	.22
8	.60	.60	.35	.35	.18	.18
9	.52	.52	.30	.30	.00	.15
10	.45	.45	.26	.26	.00	.13
11	.41	.41	.00	.23	.00	.00
12	.37	.37	.00	.21	.00	.00
13	.00	.34	.00	.00	.00	.00
14	.00	.31	.00	.00	.00	.00
15	.00	.28	.00	.00	.00	.00
>15	.00	.00	.00	.00	.00	.00

**Appendix 2: Table for Coupling Multiplier (CM)** 

Coupling Type	Coupling Multiplier	
	V< 30 inches ( 75 cm)	V ≥ 30 inches (75 cm)
Good	1.00	1.00
Fair	0.95	1.00
Poor	0.90	0.90

## **Biography**

**Mohd Norzaimi Che Ani** is Lecturer of Manufacturing Section from Universiti Kuala Lumpur, Malaysian Spanish Institute. He earned B.Eng. in Mechanical Engineering and M.Sc. degree from Universiti Teknologi Malaysia. Research interests include the field related in industrial engineering and completed various research projects focusing continuous improvement programs.

**Shahrul Kamaruddin** is an Associate Professor, of Mechanical Engineering Department from Universiti Teknologi Petronas. He received the B.Eng. from University of Strathclyde, M.Sc. degree and PhD from University of Birmingham. Various past experiences with manufacturing industries from different industries especially in the field of industrial engineering and focusing on the manufacturing systems and related field.

**Ishak Abdul Azid** is Professor of Mechanical Section from Universiti Kuala Lumpur, Malaysian Spanish Institute. He received the B.Sc. degree in Mechanical Engineering from Clarkson University, M.Sc. degree and Ph.D. from University of Wales. He has various experiences in manufacturing industries especially in the field of industrial engineering.