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PERFORMANCE TEST RESULTS FOR NEW FANS INSTALLED ON TRUWATER COOLING TOWERS AT SILTRONIC SINGAPORE PTE LTD

By

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1.0 INTRODUCTION

The conventional TRUWATER cooling tower fans in Siltronic Singapore Pte Ltd were replaced with energy efficient H'FLO fans with optimized blade profiles as part of an energy efficiency improvement project.

Measurements were carried out before and after the fans were replaced to verify the performance of the new fans and this report summarises the measured data and findings.

2.0 TRUWATER AND H'FLO FAN PERFORMANCE TESTS

2.1 Specification of fans

The specification of the original TRUWATER and new H'FLO fans are given below.

Parameter / Manufacturer	TRUWATER	H'FLO
Material	Aluminium	Fibre-reinforced plastic (FRP)
Fan diameter (mm)	3050	3050
Hub diameter (mm)	500	750
Traverse area (m^2)	7.75	7.11
Ring / Stack diameter (m)	3100	3100
Blade angle (^{o})	NA	18
Rated motor power (kW)	30	30

2.2 Pre and post-performance data

The performance, in terms of airflow and vibration, of the conventional TRUWATER cooling tower fans prior to removal and the new H'FLO fans after installation were measured for each cooling tower and the results are tabulated below.

2.2.1 Airflow

Cooling tower	Airflow (m^3/sec) using TRUWATER fan blades (pre-measurement)	Airflow (m^3/sec) using H'FLO fan blades (post-measurement)	Increase in airflow (%)
AV 101	97.37	107.36	10
AV 102	92.99	105.93	14
AV104	91.74	105.66	15
AV105	93.84	106.12	13
AV106	92.88	105.98	14
AV107	94.13	106.80	13
AV108	96.12	107.05	11

On average, an increase in airflow of nearly 13% is observed for the cooling towers after fan blade replacement.

2.2.2 Vibration

Cooling tower	Vibration (mm/s) using TRUWATER fan blades (pre-measurement) X|Y axis	Vibration (mm/s) using H'FLO fan blades (post-measurement) X|Y axis	Reduction in vibration (%)
AV 101	3.5|4.5	2.3|2.6	42
AV 102	4.6|9.8	2.8|4.5	54
AV104	4.6|8.3	2.8|4.4	47
AV105	4.1|3.4	2.5|1.2	65
AV106	5.8|2.1	3.2|1.3	38
AV107	3.7|2.2	1.9|1.1	50
AV108	3.9|3.8	2.3|1.6	58

On average, a reduction in vibration of approximately 50% is observed for the cooling towers after fan blade replacement.

3.0 CONCLUSION

Based on the data presented above, it is clear that there is both an increase in airflow and decrease in vibration after the original TRUWATER cooling tower fan blades were replaced with H'FLO fan blades. Therefore, it can be concluded that the H'FLO fan blades have met the project objectives.