

ภาคผนวก ข.4

ตัวอย่างเอกสารตรวจสอบการทำงานของระบบหล่อเย็น



ENPHOENIX

CORPORATION

**EXCELLENCE
PERFORMANCE
COOLING TOWER**

Our goals are to create more effective and better maintenance with world best quality products. We do not only offer excellent service with attractive price , but we also make a firm commitment to guarantee safety at work and on-time delivery as customers required.



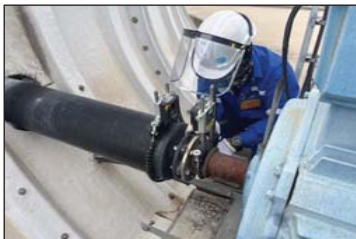
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PHOTOGRAPHS REPORT

FOR

***COOLING TOWER
CELL 1&2***



Pict. 1 Check drive shaft alignment motor before.



Pict. 2 Check drive shaft alignment gearbox before.



Pict. 3 Check coupling gap before dis-connect drive shaft.



Pict. 4 Check distance between shaft ends before dis-connect drive shaft.

EPC : Anucha Buttrasorn (Anucha Buttrasorn) 30 / Dec / 24



Pict. 5 Measure Tip track, Blade tip clearance, and Blade pitch angle before.



Pict. 6 Adjust drive shaft alignment motor after.




Pict. 7 Adjust drive shaft alignment gearbox after.



Pict. 8 Check coupling gap after final alignment.

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	Enphoenix Corporation Co.,Ltd. 68 National Highway Route 363, Tombon Thap Ma, Amphoe Muang, Rayong 21000, Thailand		
	Cell 1&2	Plant : B-Grimm Power (WHA)1	Unit :
	Cooling Tower	Job Name : Preventive Maintenance Cooling Tower	Date : 27-30 Dec 24
PHOTO REPORT			Job No. :
			Prepare by : Supakit K.



Pict. 9 Check distance between shaft ends after drive shaft.



Pict. 10 Tighten torque bolt of drive shaft coupling.




Pict. 11 Measure Tip track, Blade pitch angle, Tip clearance after replace fan blade set.



Pict. 12 Tighten torque bolt of fan blade.

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	Cooling Tower	Job Name : Preventive Maintenance Cooling Tower	Date : 27-30 Dec 24
PHOTO REPORT			Job No. :
			Prepare by : Supakit K.



Pict. 13 Tighten torque bolt of hub plate.



Pict. 14 Check Gear

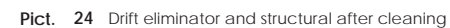
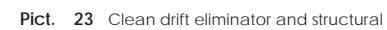


Pict. 15 Refuel gearbox oil.



Pict. 16 Coating on hub fan blade.

EPC : Anucha Buttrasorn (Anucha Buttrasorn) 30 / Dec / 24





Contact Us



Head Office :

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Muang, Rayong 21000 THAILAND
Tel. 038-017-951 TAX ID 0105557096531

สำนักงานใหญ่ :

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อ.เมือง จ.ระยอง 21000
โทร 038-017-951 เลขที่ประจำตัวผู้เสียภาษี 0105557096531



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MECHANICAL

INSPECTION Report

FOR



B.GRIMM

SINCE 1878

B.Grimm Power (WHA) I Limited.

**Preventive Maintenance
and
Cleaning**


For


**➤ Cooling Tower
Cell I**




Enphoenix Corporation

68 National Highway Route 363, Tombon Thap Ma
Amphoe Muang, Rayong 21000 Thailand,
Tel : 038-017951

																	
Enphoenix Corporation Co.,Ltd. 68 National Highway Route 363, Tombon Thap Ma, Amphoe Muang, Rayong 21000, Thailand																	
Cell 1	Plant : B-Grimm Power (WHA)1	Unit :	Date : 27-30 Dec 2024														
Cooling Tower	Job Name : PM&Cleaning Cooling Tower Gearbox		Job No. :														
CONTENT			Prepare by : Supakit K.														
<div>Content</div> <table><thead><tr><th></th><th>Page</th></tr></thead><tbody><tr><td>1. Summary - Scope of work</td><td>1</td></tr><tr><td>2. Inspection Check Sheet</td><td>2</td></tr><tr><td>3. Inspection Report</td><td>3 - 8</td></tr><tr><td>4. Spare Parts List</td><td>9</td></tr><tr><td>5. Alignment Before</td><td>10-13</td></tr><tr><td>6. Alignment After</td><td>14-17</td></tr></tbody></table>					Page	1. Summary - Scope of work	1	2. Inspection Check Sheet	2	3. Inspection Report	3 - 8	4. Spare Parts List	9	5. Alignment Before	10-13	6. Alignment After	14-17
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EPC : <u>Anucha Buttrasorn</u> (<u>Anucha Buttrasorn</u>) <u>30</u> / <u>Dec</u> / <u>24</u>																	
Customer : _____ (_____) ____ / ____ / ____																	

	Enphoenix Corporation Co.,Ltd. 68 National Highway Route 363, Tombon Thap Ma, Amphoe Muang, Rayong 21000, Thailand			
	Cell 1	Plant : B-Grimm Power (WHA)1	Unit :	Date : 27-30 Dec 2024
	Cooling Tower	Job Name : PM&Cleaning Cooling Tower Gearbox	Job No. :	
SUMMARY REPORT			Prepare by : Supakit K.	
<p><u>Scope of work</u></p> <ol style="list-style-type: none"> For Gearbox <ol style="list-style-type: none"> Check bolts tightening of gear support. Replace gear oil ISO VG 220 50 liters/cell. Refill grease for labyrinth seal of low speed shaft. Check drain and vent piping and hose. Inspect / check condition of gear teeth and condition of gearbox. For Fan <ol style="list-style-type: none"> Check all bolts tightening of hub and blade by torque wrench. Measurement and record tip clearance,blade angle. Check drain hole of fan blades. Check and clean deposits on blades and hub by high pressure water jet pump. Check condition of coating attack / corrosion and erosion of fasteners and leading edge. Check cracks on blades. For Transmission Shaft and Couplings <ol style="list-style-type: none"> Check tightness of bolt coupling. Check and record alignment. Check flexible elements condition for crack, wear, and tear or corrosion. Check and clean deposits and corrosion of shaft. Measurement gap between the spacer flange and the hub flange coupling on both ends. For Drift eliminators <ol style="list-style-type: none"> Check condition for damage. Check gaps between panels. Check and clean all deposits (salt, mud, scaling, algae) by high pressure water pump. For water distribution and spray nozzles set <ol style="list-style-type: none"> Inspect condition of spray nozzles. Tightening of sprayers if necessary. Check piping distribution for damage. Clean and remove deposits from nozzle and fill pack area. Random check and record weight of fill pack 6 ea. <p><u>Issues As-Found</u></p> <ol style="list-style-type: none"> <p><u>Solving Problems As-Found</u></p> <ol style="list-style-type: none"> <p><u>Additional & Extra Work / Other</u></p> <ol style="list-style-type: none"> 				
EPC : <u>Anucha Buttrasorn</u> (<u>Anucha Buttrasorn</u>) <u>30</u> / <u>Dec</u> / <u>24</u>				
Customer : _____ (_____) ____ / ____ / ____				
Pages 1 of 17				

	Enphoenix Corporation Co.,Ltd. 68 National Highway Route 363, Tombon Thap Ma, Amphoe Muang, Rayong 21000, Thailand				
	Cell 1	Plant : B-Grimm Power (WHA)1	Unit :	Date : 27-30 Dec 2024	
	Cooling Tower	Job Name : PM&Cleaning Cooling Tower Gearbox	Job No. :		
<input checked="" type="checkbox"/> Before <input checked="" type="checkbox"/> After		Check Sheet	Prepare by : Supakit K.		
Parts Name	Inspection Items	Inspection method	Result		
			Accepted /Reuse	Recondite/ Repaired	Replaced
HUB Coupling	Surface contact (Scratch, Trace, Seizing, Melting etc.)	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Abrasion, Crack	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fretting corrosion on back Surface	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Rust & Corrosion	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Disc Coupling	Surface contact (Scratch, Trace, Seizing, Melting etc.)	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Abrasion, Crack	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fretting corrosion on back Surface	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Rust & Corrosion	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fan blade	Deformation and defect on	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Split surface	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Abrasion, Crack	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gear	Oil Seal	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Rust & Corrosion	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stack	Abrasion, Crack	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VI. : Visual Inspection DC. : Dimension Check PT. : Penetrant Test FC. : Function test					
<p><u>Remarks</u></p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>					
EPC : <u>Anucha Buttrasorn</u> (<u>Anucha Buttrasorn</u>) <u>30</u> / <u>Dec</u> / <u>24</u>					
Customer : _____ (_____) ____ / ____ / ____					
Pages 2 of 17					



INSPECTION ACTIVITIES

FOR

PREVENTIVE MAINTENANCE AND CLEANING

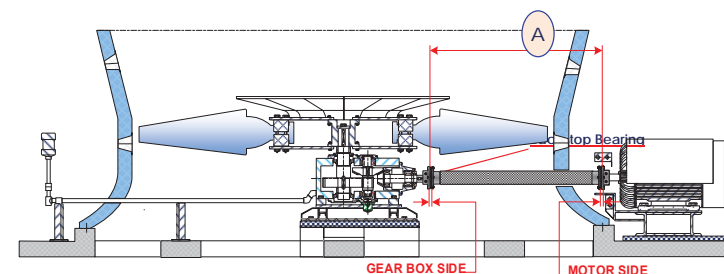
COOLING TOWER CELL 1



Enphoenix Corporation Co.,Ltd. 68 National Highway Route 363, Tombon Thap Ma, Amphoe Muang, Rayong 21000, Thailand

Cell 1	Plant : B-Grimm Power (WHA)1	Unit :	Date : 27-30 Dec 2024
Cooling Tower	Job Name : PM&Cleaning Cooling Tower Gearbox	Job No. :	
<input checked="" type="checkbox"/> Before	<input checked="" type="checkbox"/> After	Inspection Sheet	Prepare by : Supakit K.

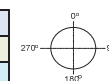
1. Gearbox, motor, drive shaft details



Item	Description	Brand	Frame no.	Serial no.	Output (RPM)
Motor	Before	OMEC MOTORS	-	-	1480
	After	OMEC MOTORS	-	-	1480
Item	Description	Brand	Model no.	Serial no.	Input (RPM)
Gearbox	Before	Hansen	ORIO10928-QVER2-CUN-12.5 <DP>	2015 / AN0083	1485
	After	Hansen	ORIO10928-QVER2-CUN-12.5 <DP>	2015 / AN0083	1485
Item	Description	Brand	Model no.		
Drive shaft	Before	Addax	LRR650.825SS		
	After	Addax	LRR650.825SS		

Position	Parts Description	Before				After				Design
		0°	90°	180°	270°	0°	90°	180°	270°	
A	Distance Between Shaft Ends (DBSE)	4801	4801	4801	4801	4801	4801	4801	4801	4800.0

Gap gearbox side				
Before				
0°	90°	180°	270°	
18.76	18.68	18.52	18.83	
After				
0°	90°	180°	270°	
18.65	18.66	18.63	18.73	



Gap motor side				
Before				
0°	90°	180°	270°	
19.05	19.14	19.12	19.09	
After				
0°	90°	180°	270°	
19.37	19.37	19.38	19.40	

Note: Maximun Parallel/ Angular misalignment: 0.05 mm.

Measurement :	1 <u>Tape measure</u>	Tool no. : <u>1</u>	Unit : <u>mm.</u>
	2 <u>Vernier caliper</u>	Tool no. : <u>1</u>	
	3 _____	Tool no. : _____	
	4 _____	Tool no. : _____	
	5 _____	Tool no. : _____	

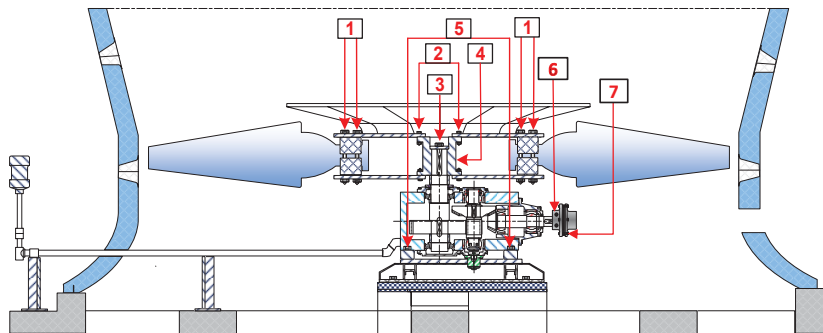
Note : Specification from manufacturer service manual or Customer requirement

EPC : Anucha B. (Anucha Buttrasorn) 30 / Dec / 24



Cell 1	Plant : B-Grimm Power (WHA)1	Unit :	Date : 27-30 Dec 2024
Cooling Tower	Job Name : PM&Cleaning Cooling Tower Gearbox	Job No. :	
<input checked="" type="checkbox"/> Before	<input checked="" type="checkbox"/> After	Inspection Sheet	Prepare by : Supakit K.

2. Torque bolt equipment



Position	Parts Description			Tightening Torque
1	Blade clamp bolt	M20	30 mm.	250 Nm.
2	Hub plate bolt	M30	46 mm.	917 Nm.
3	Lock plate bolt	M30	46 mm.	spring washer flat
4	Set screw lock bolt	-	-	-
5	Bolt lock gearbox	M30	46 mm.	Hammer Wrench
6	Set screw lock coupling	-	-	-
7	Shaft coupling bolt	M10	16 mm.	45 Nm.

Measurement : 1 Torque wrench Tool no. : 1 Unit : mm.
2 _____ Tool no. : _____
3 _____ Tool no. : _____
4 _____ Tool no. : _____
5 _____ Tool no. : _____

Note : Specification from manufacturer service manual or Customer requirement

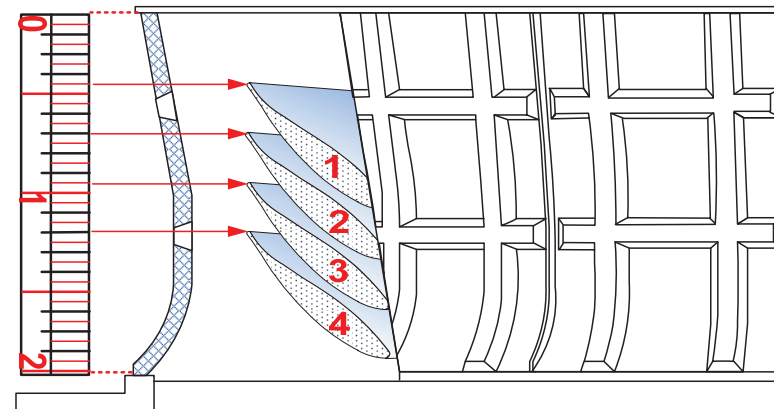
EPC : Anucha B. (Anucha Buttrasorn) 30 / Dec / 24

Customer : _____ (_____) _____ / _____ / _____



Cell 1	Plant : B-Grimm Power (WHA)1	Unit :	Date : 27-30 Dec 2024
Cooling Tower	Job Name : PM&Cleaning Cooling Tower Gearbox	Job No. :	
<input checked="" type="checkbox"/> Before	<input checked="" type="checkbox"/> After	Inspection Sheet	Prepare by : Supakit K.

3. Fan blade measurement and Tip track



BEFORE			AFTER		
Blade No.	Blade Tracking	Design	Blade No.	Blade Tracking	Design
1	0	±25.4	1	0	±25.4
2	+5		2	+4	
3	-1		3	+2	
4	+5		4	-17	
5	-12		5	-18	
6	-9		6	-12	
7	-20		7	-7	
8	-15		8	-12	

Note: Fan Blade tracking Tolerance not over 25.4 mm

Measurement : 1 Ruler Tool no. : 1 Unit : mm.
2 _____ Tool no. : _____
3 _____ Tool no. : _____
4 _____ Tool no. : _____
5 _____ Tool no. : _____

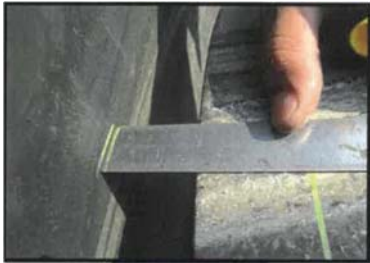
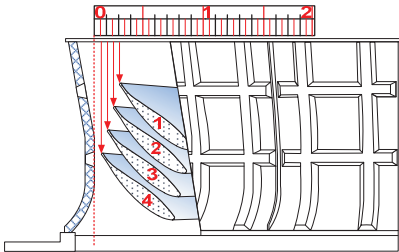
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Cell 1	Plant : B-Grimm Power (WHA)1	Unit :	Date : 27-30 Dec 2024
Cooling Tower	Job Name : PM&Cleaning Cooling Tower Gearbox	Job No. :	
<input checked="" type="checkbox"/> Before	<input checked="" type="checkbox"/> After	Inspection Sheet	Prepare by : Supakit K.

4. BLADE TIP CLEARANCE MEASUREMENT



Before										After									
Blade No.	Tip Clearance								Design	Blade No.	Tip Clearance								Design
	0	45	90	135	180	225	270	315			0	45	90	135	180	225	270	315	
1	28.0	31.0	33.0	30.0	28.0	30.0	36.0	50.0		1	26.0	29.0	31.0	28.0	26.0	28.0	34.0	48.0	
2	25.0	28.0	30.0	27.0	25.0	27.0	33.0	47.0		2	24.0	27.0	29.0	26.0	24.0	26.0	32.0	46.0	
3	24.0	27.0	29.0	26.0	24.0	26.0	32.0	46.0		3	24.0	27.0	29.0	26.0	24.0	26.0	32.0	46.0	
4	26.0	29.0	31.0	28.0	26.0	28.0	34.0	48.0		4	25.0	28.0	30.0	27.0	25.0	27.0	33.0	47.0	
5	26.0	29.0	31.0	28.0	26.0	28.0	34.0	48.0		5	25.0	28.0	30.0	27.0	25.0	27.0	33.0	47.0	
6	25.0	28.0	30.0	27.0	25.0	27.0	33.0	47.0		6	24.0	27.0	29.0	26.0	24.0	26.0	32.0	46.0	
7	25.0	28.0	30.0	27.0	25.0	27.0	33.0	47.0		7	25.0	28.0	30.0	27.0	25.0	27.0	33.0	47.0	
8	27.0	30.0	32.0	29.0	27.0	29.0	35.0	49.0		8	25.0	28.0	30.0	27.0	25.0	27.0	33.0	47.0	

Note:

Measurement : 1 Ruler Tool no. : 1 Unit : mm.
 2 _____ Tool no. : _____
 3 _____ Tool no. : _____
 4 _____ Tool no. : _____
 5 _____ Tool no. : _____

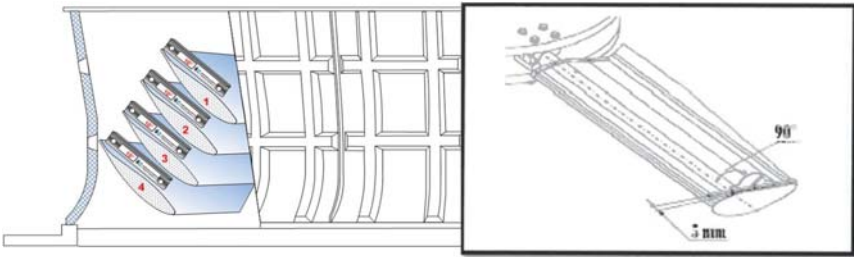
Note : Specification from manufacturer service manual or Customer requirement

EPC : Anucha Buttrasorn (Anucha Buttrasorn) 30 / Dec / 24

Customer : _____ (_____) _____ / _____ / _____

Enphoenix Corporation Co.,Ltd. 68 National Highway Route 363, Tombon Thap Ma, Amphoe Muang, Rayong 21000, Thailand			
Cell 1	Plant : B-Grimm Power (WHA)1	Unit :	Date : 27-30 Dec 2024
Cooling Tower	Job Name : PM&Cleaning Cooling Tower Gearbox	Job No. :	
<input checked="" type="checkbox"/> Before	<input checked="" type="checkbox"/> After	Inspection Sheet	Prepare by : Supakit K.

5. BLADE PITCH ANGLE MEASUREMENT



BEFORE			AFTER		
BLADE NO.	BLADE PITCH ANGLE	DESIGN	BLADE NO.	BLADE PITCH ANGLE	DESIGN
1	3.5	4.7	1	4.8	4.7
2	3.5		2	4.6	
3	3.7		3	4.7	
4	3.1		4	4.8	
5	3.7		5	4.7	
6	3.6		6	4.9	
7	3.5		7	4.8	
8	3.7		8	4.7	

Note: Fan Pitch Angle Tolerance degree 4.7 +/- 0.2 degree.

Measurement : 1 Digital level Tool no. : 1 Unit : mm.
 2 _____ Tool no. : _____
 3 _____ Tool no. : _____
 4 _____ Tool no. : _____
 5 _____ Tool no. : _____

Note : Specification from manufacturer service manual or Customer requirement

EPC : Anucha Buttrasorn (Anucha Buttrasorn) 30 / Dec / 24

Customer : _____ (_____) _____ / _____ / _____



Enphoenix Corporation Co.,Ltd. 68 National Highway Route 363, Tombon Thap Ma, Amphoe Muang, Rayong 21000, Thailand

Cell 1

Plant : B-Grimm Power (WHA)1

Unit :

Date : 27-30 Dec 2024

Cooling Tower

Job Name : PM&Cleaning Cooling Tower Gearbox

Job No. :

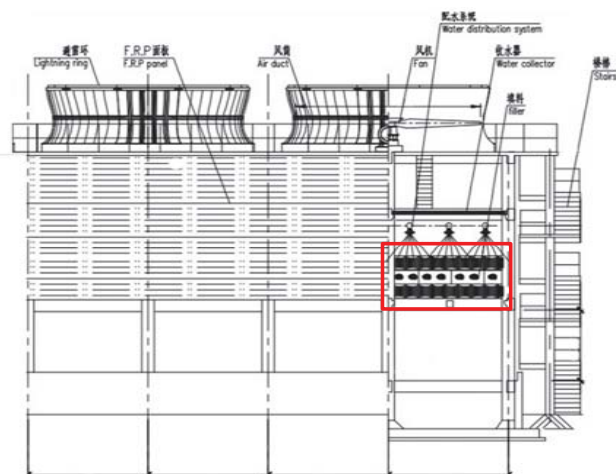
☒ Before

☐ After

Inspection Sheet

Prepare by : Supakit K.

6. RANDOM WEIGHT FILL PACK FOR BEFORE



Layer	CTW 1												Remark
	Point 1		Point 2		Point 3		Point 4		Point 5		Point 6		
1	Fill Size	Weight (Kgs)	Fill Size	Weight (Kgs)	Fill Size	Weight (Kgs)	Fill Size	Weight (Kgs)	Fill Size	Weight (Kgs)	Fill Size	Weight (Kgs)	
	2000		2000		2000		2000		2000		2000		
	x		x		x		x		x		x		
	500	12.8	500	13.0	500	13.5	500	13.2	500	12.8	500	13.0	
	x		x		x		x		x		x		
	500		500		500		500		500		500		
Note :													

Measurement :	1 <u>scales</u>	Tool no. :	<u>1</u>	Unit :	<u>Kg.</u>
	2 _____	Tool no. :	_____		
	3 _____	Tool no. :	_____		
	4 _____	Tool no. :	_____		
	5 _____	Tool no. :	_____		
Note : Specification from manufacturer service manual or Customer requirement					

EPC : Anucha Buttrasorn (Anucha Buttrasorn) 30 / Dec / 24

Customer : _____ (_____) _____ / _____ / _____



USED PART LIST FOR COOLING TOWER FAN CELL 1

[illegible]

***DRIVE SHAFT
ALIGNMENT BEFORE
FOR
COOLING TOWER FAN
CELL 1***

HORIZONTAL REPORT

VERTICAL

Offset (mm)



-0.01

Angle (mm/100 mm)

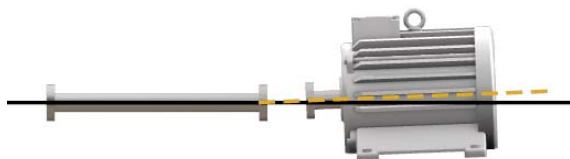


0.07

Feet Values (mm)

MF1 0.26

MF2 0.57



*as found results

HORIZONTAL

Offset (mm)



-0.02

Angle (mm/100 mm)

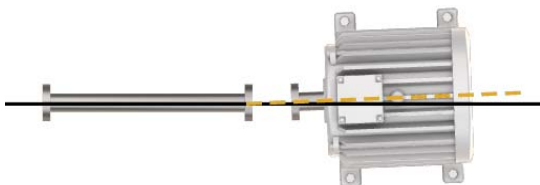


0.07

Feet Values (mm)

MF1 0.24

MF2 0.54



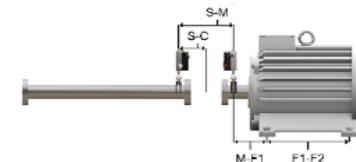
Signature: _____

MACHINE SETUP

COUPLING	SHORT FLEX
COUPLING Ø (mm)	---
S-C (mm)	65
S-M (mm)	130
M-F1 (mm)	320
MF1-F2 (mm)	450

(S) Empty Shaft

(M) Electric Motor



TOLERANCE (EASY-LASER)


RPM 1500

	Offset (mm)	Angle (mm/100 mm)
Acceptable (*)	0.07	0.07
Excellent (**)	0.05	0.05

THERMAL COMPENSATION

VERTICAL OFFSET (mm)	---
HORIZONTAL OFFSET (mm)	---
VERTICAL ANGLE (mm/100 mm)	---
HORIZONTAL ANGLE (mm/100 mm)	---

SOFTFOOT

---	---	0.02	0.11
			
---	---	0.00	0.02

NOTES

HOZTOP(AL ZE) OZ(
dEZ(NCAL

Offset gmm. 0*02
AnVle gmm/100 mm. -0*06
★★ ★★

Feet d alues gmm.
MF1 -0*2R
MF2 -0*46

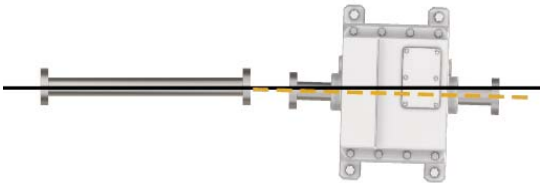


Sas founUresults

HOZTOP(AL

Offset gmm. 0*00
AnVle gmm/100 mm. -0*06
★★ ★★

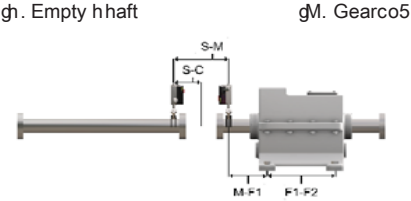
Feet d alues gmm.
MF1 -0*23
MF2 -0*44



hiVnature: _____

MACHNPE hE(X)

COX) LNP G	hHOZ(FLEY
COX) LNP G b gmm.	---
h-C gmm.	3R
h-M gmm.	160
M-F1 gmm.	700
MF1-F2 gmm.	R20



(OLEZAPCE gEAhx-LAhEZ.

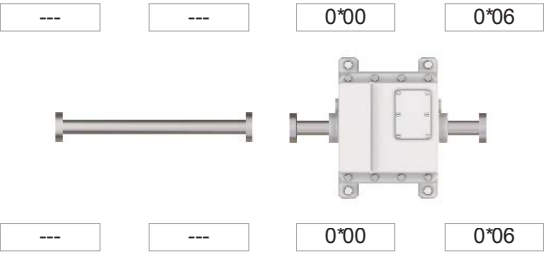
Z) M 1R00

	Offset gmm.	AnVle gmm/100 mm.
A, , eptacle gS	0*07	0*07
E5, ellent gSS	0*0R	0*0R

(HEZMAL COM) EPPhA(NOP

dEZ(NCAL OFFhE(gmm.	---
HOZTOP(AL OFFhE(gmm.	---
dEZ(NCAL APGLE gmm/100 mm.	---
HOZTOP(AL APGLE gmm/100 mm.	---

hOF(FOO(



PO(Eh



***DRIVE SHAFT
ALIGNMENT AFTER

FOR

COOLING TOWER FAN
CELL 1***

EASY-LASER®

Date: 12-27-2024 11:21 AM
Company: Easy-Laser AB
Operator:
Measurement: Horizontal
File name: After Motor B-Grimm - Cell 1
Detector serial: 165527, 165537

HORIZONTAL REPORT

VERTICAL

Offset (mm)



0.00

★★

0.00 *

Angle (mm/100 mm)



0.01

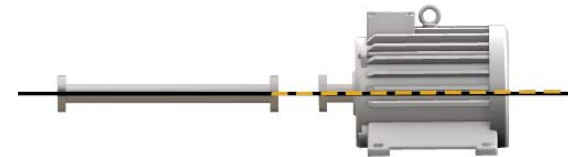
★★

0.06 *

Feet Values (mm)

MF1 0.04

MF2 0.09



*as found results

HORIZONTAL

Offset (mm)



0.00

★★

-0.01 *

Angle (mm/100 mm)



0.03

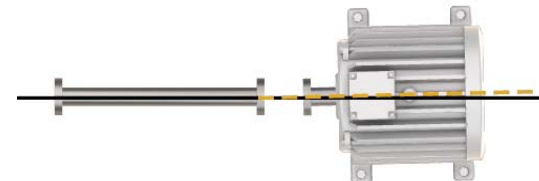
★★

0.06 *

Feet Values (mm)

MF1 0.12

MF2 0.27



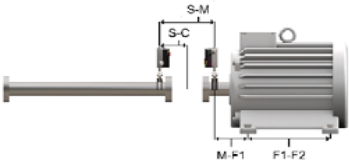
Signature: _____

MACHINE SETUP

COUPLING	SHORT FLEX
COUPLING Ø (mm)	---
S-C (mm)	70
S-M (mm)	140
M-F1 (mm)	300
MF1-F2 (mm)	450

(S) Empty Shaft

(M) Electric Motor



TOLERANCE (EASY-LASER)

RPM 1500

	Offset (mm)	Angle (mm/100 mm)
Acceptable (*)	0.07	0.07
Excellent (**)	0.05	0.05

THERMAL COMPENSATION

VERTICAL OFFSET (mm)	---
HORIZONTAL OFFSET (mm)	---
VERTICAL ANGLE (mm/100 mm)	---
HORIZONTAL ANGLE (mm/100 mm)	---

SOFTFOOT

---	---	0.00	0.01
---	---	0.00	0.02

NOTES

EASY-LASER®

Date: 12-27-2024 2:66 AM
Company: Easy-Laser BO
Operator:
Measurement: i orl ontaF
File name: BGr O-c rznm c ear 5eF1
Detector serial: F1, 3327R1, 3367

i u l Z u T P B L I E A u l P

VEI PZCBL



feet ValFes (mm)
Mf 1 -0.0,
Mf 2 -0.11

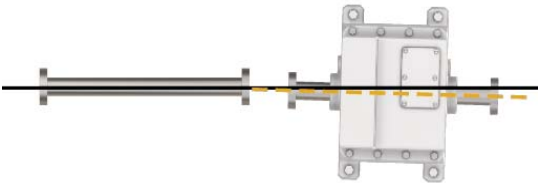


*as GHd reshFs

i u l Z u T P B L



feet ValFes (mm)
Mf 1 -0.23
Mf 2 -0.46



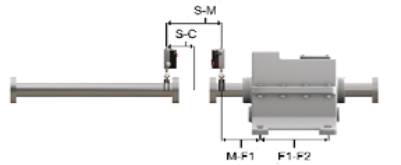
Signature: _____

MBCi ZTE SEPUA

Cu UALZTc	Si u l P f LEY
Cu UALZTc b (mm)	---
S-C (mm)	, 3
S-M (mm)	160
M-f 1 (mm)	700
Mf 1-f 2 (mm)	320

(S) Empty ShaG

(M) c earXoh



Pu LEI BTCE (EBSx-LBSEI)

I AM 1300

	u Gbet (mm)	BngFe (mm/100 mm)
B55eptaXfe (*)	0.07	0.07
Eh5eFeent (**)	0.03	0.03

Pi EI MBL Cu MAETSBPZ T

VEI PZBL uff SEP (mm)	---
i u l Znu TPBL uff SEP (mm)	---
VEI PZBL BTc LE (mm/100 mm)	---
i u l Znu TPBL BTc LE (mm/100 mm)	---

Su f Pf u u P

---	---	0.01	0.01
-----	-----	------	------



---	---	0.00	0.01
-----	-----	------	------

Tu PES

Contact Us



Head Office :
Head Office : 68 ,363 Road, Tambol Tabma ,
Muang, Rayong 21000 THAILAND
Tel. 038-017-951 TAX ID 0105557096531

สำนักงานใหญ่ :
68 ถ.ทางหลวงแผ่นดินสาย 363 ต.ทับมา
อ.เมือง จ.ระยอง 21000
โทร 038-017-951 เลขที่ประจำตัวผู้เสียภาษี 0105557096531



website : www.enphoenix.co.th <<<>>> email : anucha@enphoenix.co.th



ENPHOENIX

CORPORATION

**EXCELLENCE
PERFORMANCE
COOLING TOWER**

Our goals are to create more effective and better maintenance with world best quality products. We do not only offer excellent service with attractive price, but we also make a firm commitment to guarantee safety at work and on-time delivery as customers required.



www.enphoenix.co.th

MECHANICAL

INSPECTION Report

FOR



B.Grimm Power (WHA) I Limited.


**Preventive Maintenance
and
Cleaning**


For

**➤ Cooling Tower
Cell 2**



Enphoenix Corporation
68 National Highway Route 363, Tombon Thap Ma
Amphoe Muang, Rayong 21000 Thailand,
Tel : 038-017951

	Enphoenix Corporation Co.,Ltd. 68 National Highway Route 363, Tombon Thap Ma, Amphoe Muang, Rayong 21000, Thailand																	
	Cell 2	Plant : B-Grimm Power (WHA)1	Unit :	Date : 27 - 30 Dec 2024														
	Cooling Tower	Job Name : PM&Cleaning Cooling Tower Gearbox	Job No. :															
CONTENT			Prepare by : Supakit K.															
<div>Content</div> <table><thead><tr><th></th><th>Page</th></tr></thead><tbody><tr><td>1. Summary - Scope of work</td><td>1</td></tr><tr><td>2. Inspection Check Sheet</td><td>2</td></tr><tr><td>3. Inspection Report</td><td>3 - 8</td></tr><tr><td>4. Spare Parts List</td><td>9</td></tr><tr><td>5. Alignment Before</td><td>10-13</td></tr><tr><td>6. Alignment After</td><td>14-17</td></tr></tbody></table>						Page	1. Summary - Scope of work	1	2. Inspection Check Sheet	2	3. Inspection Report	3 - 8	4. Spare Parts List	9	5. Alignment Before	10-13	6. Alignment After	14-17
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6. Alignment After	14-17																	
EPC : <u>Anucha Buttrasorn</u> (<u>Anucha Buttrasorn</u>) <u>30</u> / <u>Dec</u> / <u>24</u>																		
Customer : _____ (_____) ____ / ____ / ____																		

	Enphoenix Corporation Co.,Ltd. 68 National Highway Route 363, Tombon Thap Ma, Amphoe Muang, Rayong 21000, Thailand			
	Cell 2	Plant : B-Grimm Power (WHA)1	Unit :	Date : 27 - 30 Dec 2024
	Cooling Tower	Job Name : PM&Cleaning Cooling Tower Gearbox	Job No. :	
SUMMARY REPORT			Prepare by : Supakit K.	
<div>Scope of work</div> <div>1. For Gearbox</div> <div>1.1 Check bolts tightening of gear support.</div> <div>1.2 Replace gear oil ISO VG 220 50 liters/cell.</div> <div>1.3 Refill grease for labyrinth seal of low speed shaft.</div> <div>1.4 Check drain and vent piping and hose.</div> <div>1.5 Inspect / check condition of gear teeth and condition of gearbox.</div> <div>2. For Fan</div> <div>2.1 Check all bolts tightening of hub and blade by torque wrench.</div> <div>2.2 Measurement and record tip clearance,blade angle.</div> <div>2.3 Check drain hole of fan blades.</div> <div>2.4 Check and clean deposits on blades and hub by high pressure water jet pump.</div> <div>2.5 Check condition of coating attack / corrosion and erosion of fasteners and leading edge.</div> <div>2.6 Check cracks on blades.</div> <div>3. For Transmission Shaft and Couplings</div> <div>3.1 Check tightness of bolt coupling.</div> <div>3.2 Check and record alignment.</div> <div>3.3 Check flexible elements condition for crack, wear, and tear or corrosion.</div> <div>3.4 Check and clean deposits and corrosion of shaft.</div> <div>3.5 Measurement gap between the spacer flange and the hub flange coupling on both ends.</div> <div>4. For Drift eliminators</div> <div>4.1 Check condition for damage.</div> <div>4.2 Check gaps between panels.</div> <div>4.3 Check and clean all deposits (salt, mud, scaling, algae) by high pressure water pump.</div> <div>5. For water distribution and spray nozzles set</div> <div>5.1 Inspect condition of spray nozzles.</div> <div>5.2 Tightening of sprayers if necessary.</div> <div>5.3 Check piping distribution for damage.</div> <div>5.4 Clean and remove deposits from nozzle and fill pack area.</div> <div>5.5 Random check and record weight of fill pack 6 ea.</div> <div>Issues As-Found</div> <div>1. _____</div> <div>2. _____</div> <div>Solving Problems As-Found</div> <div>1. _____</div> <div>2. _____</div> <div>Additional & Extra Work / Other</div> <div>1. _____</div> <div>2. _____</div>				
EPC : <u>Anucha Buttrasorn</u> (<u>Anucha Buttrasorn</u>) <u>30</u> / <u>Dec</u> / <u>24</u>				
Customer : _____ (_____) ____ / ____ / ____				
Pages 1 of 17				

 ENPHOENIX	Enphoenix Corporation Co.,Ltd. 68 National Highway Route 363, Tombon Thap Ma, Amphoe Muang, Rayong 21000, Thailand			
	Cell 2	Plant : B-Grimm Power (WHA)1	Unit :	Date : 27 - 30 Dec 2024
Cooling Tower	Job Name : PM&Cleaning Cooling Tower Gearbox		Job No. :	
<input checked="" type="checkbox"/> Before <input checked="" type="checkbox"/> After		Check Sheet	Prepare by : Supakit K.	

Parts Name	Inspection Items	Inspection method	Result		
			Accepted /Reuse	Recondite/ Repaired	Replaced
HUB Coupling	Surface contact (Scratch, Trace, Seizing, Melting etc.)	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Abrasion, Crack	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fretting corrosion on back Surface	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Rust & Corrosion	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Disc Coupling	Surface contact (Scratch, Trace, Seizing, Melting etc.)	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Abrasion, Crack	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fretting corrosion on back Surface	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Rust & Corrosion	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fan blade	Deformation and defect on	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Split surface	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Abrasion, Crack	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gear	Oil Seal	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Rust & Corrosion	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stack	Abrasion, Crack	<input checked="" type="checkbox"/> VI <input type="checkbox"/> DC <input type="checkbox"/> PT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

VI. : Visual Inspection	DC. : Dimension Check	PT. : Penetrant Test	FC. : Function test
-------------------------	-----------------------	----------------------	---------------------

Remarks

EPC :		(<u>Anucha Buttrasorn</u>) <u>30</u> / <u>Dec</u> / <u>24</u>
Customer :	(_____) ____ / ____ / ____	

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INSPECTION ACTIVITIES

FOR

PREVENTIVE MAINTENANCE

AND CLEANING

COOLING TOWER

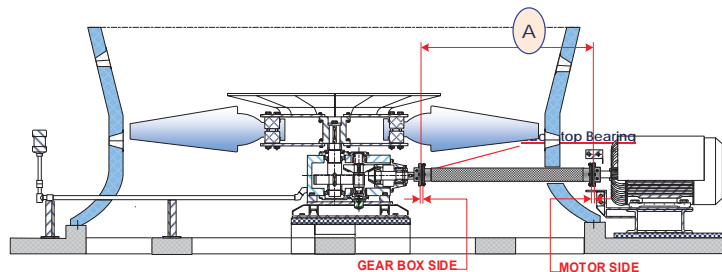
CELL 2



Enphoenix Corporation Co.,Ltd. 68 National Highway Route 363, Tombon Thap Ma, Amphoe Muang, Rayong 21000, Thailand

Cell 2	Plant : B-Grimm Power (WHA)1	Unit :	Date : 27 - 30 Dec 2024
Cooling Tower	Job Name : PM&Cleaning Cooling Tower Gearbox	Job No. :	
<input checked="" type="checkbox"/> Before	<input checked="" type="checkbox"/> After	Inspection Sheet	Prepare by : Supakit K.

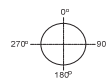
1. Gearbox, motor, drive shaft details



Item	Description	Brand	Frame no.	Serial no.	Output (RPM)
Motor	Before	ABB	-	-	1487
	After	ABB	-	-	1487
Item	Description	Brand	Model no.	Serial no.	Input (RPM)
Gearbox	Before	Hansen	ORIO10928-QVER2-CUN-12.5 <DP>	N/A	1485
	After	Hansen	ORIO10928-QVER2-CUN-12.5 <DP>	N/A	1485
Item	Description	Brand	Model no.		
Drive shaft	Before	Addax	LRR650.825SS		
	After	Addax	LRR650.825SS		

Position	Parts Description	Before				After				Design
		0°	90°	180°	270°	0°	90°	180°	270°	
A	Distance Between Shaft Ends (DBSE)	4801	4801	4801	4801	4801	4801	4801	4801	4800.0

Gap gearbox side				
Before				
0°	90°	180°	270°	
18.80	18.81	18.83	18.84	
After				
0°	90°	180°	270°	
18.83	18.85	18.82	18.86	



Gap motor side				
Before				
0°	90°	180°	270°	
19.18	19.20	19.24	19.21	
After				
0°	90°	180°	270°	
19.20	19.20	19.21	19.19	

Note: Maximun Parallel/ Angular misalignment: 0.05 mm.

Measurement :	1 <u>Tape measure</u>	Tool no. :	<u>1</u>	Unit : <u>mm.</u>
	2 <u>Vernier caliper</u>	Tool no. :	<u>1</u>	
	3 _____	Tool no. :	_____	
	4 _____	Tool no. :	_____	
	5 _____	Tool no. :	_____	

Note : Specification from manufacturer service manual or Customer requirement

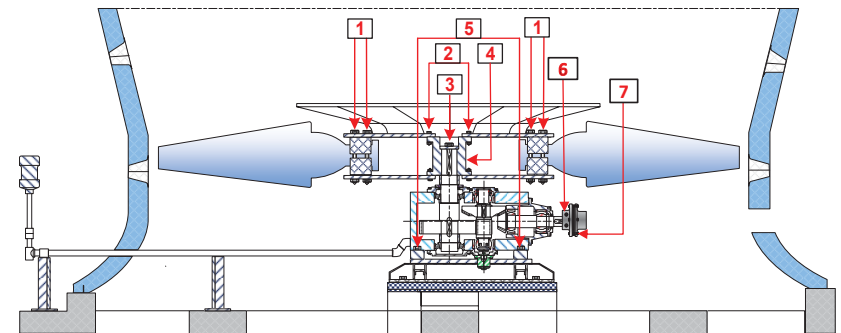
EPC : Anucha B. (Anucha Buttrasorn) 30 / Dec / 24



Enphoenix Corporation Co.,Ltd. 68 National Highway Route 363, Tombon Thap Ma, Amphoe Muang, Rayong 21000, Thailand

Cell 2	Plant : B-Grimm Power (WHA)1	Unit :	Date : 27 - 30 Dec 2024
Cooling Tower	Job Name : PM&Cleaning Cooling Tower Gearbox	Job No. :	
<input checked="" type="checkbox"/> Before	<input checked="" type="checkbox"/> After	Inspection Sheet	Prepare by : Supakit K.

2. Torque bolt equipment



Position	Parts Description			Tightening Torque
1	Blade clamp bolt	M20	30 mm.	250 Nm.
2	Hub plate bolt	M30	46 mm.	917 Nm.
3	Lock plate bolt	M30	46 mm.	spring washer flat
4	Set screw lock bolt	-	-	-
5	Bolt lock gearbox	M30	46 mm.	Hammer Wrench
6	Set screw lock coupling	-	-	-
7	Shaft coupling bolt	M10	16 mm.	45 Nm.

Measurement :	1 <u>Torque wrench</u>	Tool no. :	<u>1</u>	Unit : <u>mm.</u>
	2 _____	Tool no. :	_____	
	3 _____	Tool no. :	_____	
	4 _____	Tool no. :	_____	
	5 _____	Tool no. :	_____	

Note : Specification from manufacturer service manual or Customer requirement

EPC : Anucha B. (Anucha Buttrasorn) 30 / Dec / 24

Customer : _____ (_____) _____ / _____ / _____

Enphoenix Corporation Co.,Ltd. 68 National Highway Route 363, Tombon Thap Ma, Amphoe Muang, Rayong 21000, Thailand

Cell 2

Plant : B-Grimm Power (WHA)1

Unit :

Date : 27 - 30 Dec 2024

Cooling Tower

Job Name : PM&Cleaning Cooling Tower Gearbox

Job No. :

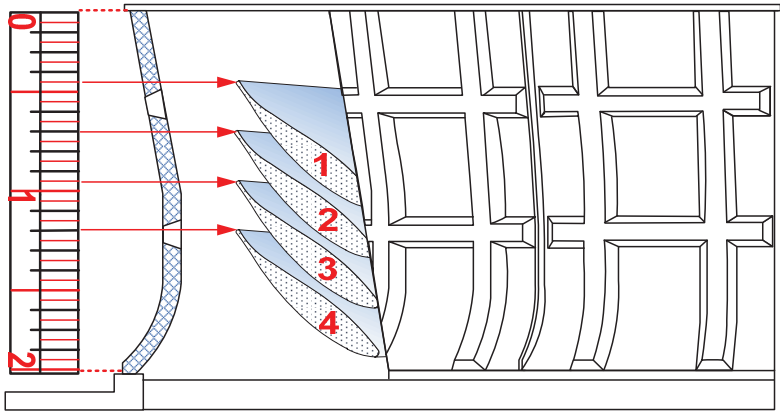
☒ Before

☒ After

Inspection Sheet

Prepare by : Supakit K.

3. Fan blade measurement and Tip track



BEFORE			AFTER		
Blade No.	Blade Tracking	Design	Blade No.	Blade Tracking	Design
1	0	±25.4	1	0	±25.4
2	-2		2	-4	
3	+12		3	+13	
4	+9		4	+8	
5	+20		5	+18	
6	+7		6	+12	
7	+22		7	+20	
8	+15		8	+17	

Note: Fan Blade tracking Tolerance not over 25.4 mm

Measurement :

1

2

3

4

5

Ruler

Tool no. :

1

Unit : mm.

Note : Specification from manufacturer service manual or Customer requirement

EPC : Anucha B. (Anucha Buttrasorn) 30 / Dec / 24

Customer : _____ (_____) ____ / ____ / ____

Pages 5 of 17

Enphoenix Corporation Co.,Ltd. 68 National Highway Route 363, Tombon Thap Ma, Amphoe Muang, Rayong 21000, Thailand

Cell 2

Plant : B-Grimm Power (WHA)1

Unit :

Date : 27 - 30 Dec 2024

Cooling Tower

Job Name : PM&Cleaning Cooling Tower Gearbox

Job No. :

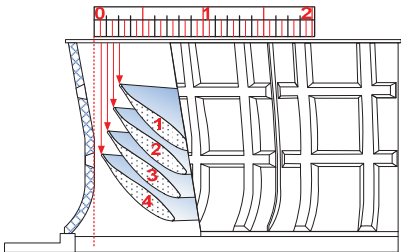
☒ Before

☒ After

Inspection Sheet

Prepare by : Supakit K.

4. BLADE TIP CLEARANCE MEASUREMENT



Before									After										
Blade No.	Tip Clearance								Design	Blade No.	Tip Clearance								Design
	0	45	90	135	180	225	270	315			0	45	90	135	180	225	270	315	
1	27.0	24.0	21.0	29.0	25.0	27.0	41.0	38.0		1	28.0	27.0	26.0	34.0	29.0	44.0	12.0	24.0	
2	27.0	24.0	21.0	29.0	25.0	27.0	41.0	38.0		2	29.0	28.0	27.0	35.0	30.0	45.0	13.0	25.0	
3	26.0	23.0	20.0	28.0	24.0	26.0	40.0	37.0		3	28.0	27.0	26.0	34.0	29.0	44.0	12.0	24.0	
4	26.0	23.0	20.0	28.0	24.0	26.0	40.0	37.0		4	28.0	27.0	26.0	34.0	29.0	44.0	12.0	24.0	
5	27.0	24.0	21.0	29.0	25.0	27.0	41.0	38.0		5	29.0	28.0	27.0	35.0	30.0	45.0	13.0	25.0	
6	26.0	23.0	20.0	28.0	24.0	26.0	40.0	37.0		6	28.0	27.0	26.0	34.0	29.0	44.0	12.0	24.0	
7	26.0	23.0	20.0	28.0	24.0	26.0	40.0	37.0		7	27.0	26.0	25.0	33.0	28.0	43.0	11.0	23.0	
8	27.0	24.0	21.0	29.0	25.0	27.0	41.0	38.0		8	28.0	27.0	26.0	34.0	29.0	44.0	12.0	24.0	

Note:

Measurement :

1

2

3

4

5

Ruler

Tool no. :

1

Unit : mm.

Note : Specification from manufacturer service manual or Customer requirement

EPC : Anucha B. (Anucha Buttrasorn) 30 / Dec / 24

Customer : _____ (_____) ____ / ____ / ____

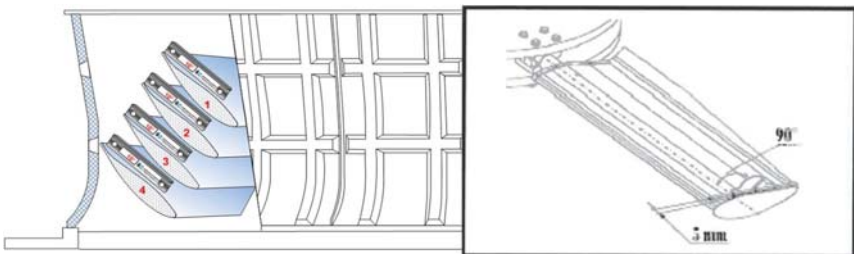
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Enphoenix Corporation Co.,Ltd. 68 National Highway Route 363, Tombon Thap Ma, Amphoe Muang, Rayong 21000, Thailand

Cell 2	Plant : B-Grimm Power (WHA)1	Unit :	Date : 27 - 30 Dec 2024
Cooling Tower	Job Name : PM&Cleaning Cooling Tower Gearbox	Job No. :	
<input checked="" type="checkbox"/> Before	<input checked="" type="checkbox"/> After	Inspection Sheet	Prepare by : Supakit K.

5. BLADE PITCH ANGLE MEASUREMENT



BEFORE			AFTER		
BLADE NO.	BLADE PITCH ANGLE	DESIGN	BLADE NO.	BLADE PITCH ANGLE	DESIGN
1	3.5	4.7	1	4.8	4.7
2	4.1		2	4.5	
3	3.7		3	4.6	
4	3.7		4	4.5	
5	3.7		5	4.5	
6	3.6		6	4.8	
7	3.5		7	4.7	
8	3.9		8	4.5	

Note: Fan Pitch Angle Tolerance degree 4.7 +/- 0.2 degree.

Measurement :	1 <u>Digital level</u>	Tool no. :	<u>1</u>	Unit :	<u>mm.</u>
	2 _____	Tool no. :	_____		
	3 _____	Tool no. :	_____		
	4 _____	Tool no. :	_____		
	5 _____	Tool no. :	_____		

Note : Specification from manufacturer service manual or Customer requirement

EPC : Anucha Buttrasorn (Anucha Buttrasorn) 30 / Dec / 24

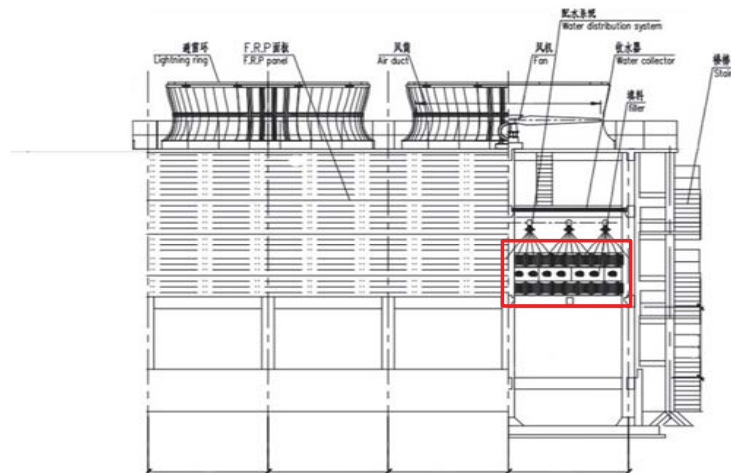
Customer : _____ (_____) ____ / ____ / ____



Enphoenix Corporation Co.,Ltd. 68 National Highway Route 363, Tombon Thap Ma, Amphoe Muang, Rayong 21000, Thailand

Cell 2	Plant : B-Grimm Power (WHA)1	Unit :	Date : 27 - 30 Dec 2024
Cooling Tower	Job Name : PM&Cleaning Cooling Tower Gearbox	Job No. :	
<input checked="" type="checkbox"/> Before	<input type="checkbox"/> After	Inspection Sheet	Prepare by : Supakit K.

6. RANDOM WEIGHT FILL PACK FOR BEFORE



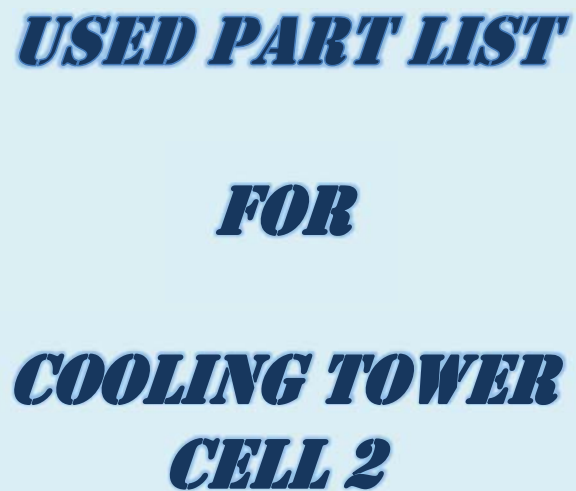
Layer	CTW 1												
	Point 1		Point 2		Point 3		Point 4		Point 5		Point 6		Remark
	Fill Size	Weight (Kgs)	Fill Size	Weight (Kgs)	Fill Size	Weight (Kgs)	Fill Size	Weight (Kgs)	Fill Size	Weight (Kgs)	Fill Size	Weight (Kgs)	
1	2000		2000		2000		2000		2000		2000		
	x		x		x		x		x		x		
	500	18.0	500	18.0	500	17.4	500	17.6	500	15.6	500	14.0	
	x		x		x		x		x		x		
	500		500		500		500		500		500		
Note :													

Measurement :	1 <u>scales</u>	Tool no. :	<u>1</u>	Unit :	<u>Kg.</u>
	2 _____	Tool no. :	_____		
	3 _____	Tool no. :	_____		
	4 _____	Tool no. :	_____		
	5 _____	Tool no. :	_____		

Note : Specification from manufacturer service manual or Customer requirement

EPC : Anucha Buttrasorn (Anucha Buttrasorn) 30 / Dec / 24

Customer : _____ (_____) ____ / ____ / ____

[illegible]



***DRIVE SHAFT
ALIGNMENT BEFORE

FOR

COOLING TOWER
CELL 2***

EASY-LASER®

Date: 12-29-2024 8:56 AM
Company: Easy-Laser AB
Operator:
Measurement: Horizontal
File name: Before Motor B-Grimm - Cell 2
Detector serial: 165527, 165537

HORIZONTAL REPORT

VERTICAL

Offset (mm)



-0.01



Angle (mm/100 mm)



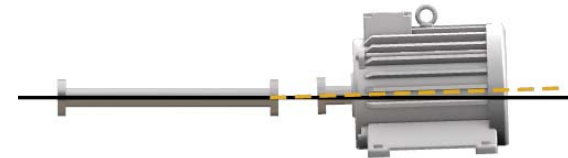
0.05



Feet Values (mm)

MF1 0.21

MF2 0.45



*as found results

HORIZONTAL

Offset (mm)



0.00



Angle (mm/100 mm)



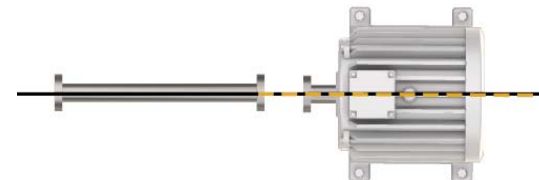
-0.01



Feet Values (mm)

MF1 -0.03

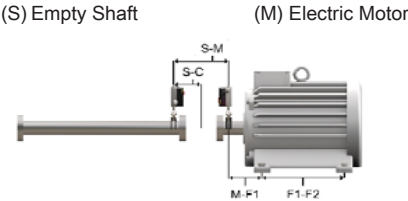
MF2 -0.05



Signature: _____

MACHINE SETUP

COUPLING	SHORT FLEX
COUPLING Ø (mm)	---
S-C (mm)	65
S-M (mm)	130
M-F1 (mm)	360
MF1-F2 (mm)	480



TOLERANCE (EASY-LASER)

RPM 1485

	Offset (mm)	Angle (mm/100 mm)
Acceptable (*)	0.07	0.07
Excellent (**)	0.05	0.05

THERMAL COMPENSATION

VERTICAL OFFSET (mm)	---
HORIZONTAL OFFSET (mm)	---
VERTICAL ANGLE (mm/100 mm)	---
HORIZONTAL ANGLE (mm/100 mm)	---

SOFTFOOT

---	---	0.00	0.00
---	---	0.00	0.01

NOTES

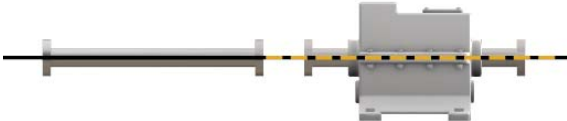
EASY-LASER®

Date: 12-29-2024 9:09 85
6 AMCaom panmyaneE8s
L CeEaAE
5 eanr EeMeot: BAEDAotaH
i O oame: sezAE l eaEAF s-l EMM - 6 eH2
DeteGAENEBAH1c772, 31c77R

BL I ZL TP8y l p(L I P

* pl P8y

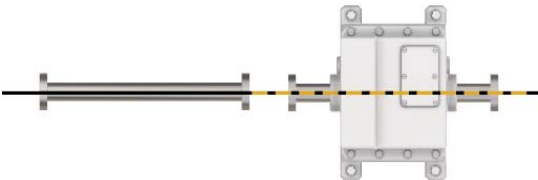
L znet)MMg	8 o. H)MM/100 MMg	i eet * aHten)MMg
0V00	0V02	5 i 1 0V14
★★	★★	5 i 2 0V24



dan zAr oS E8nr lth

BL I ZL TP8y

L znet)MMg	8 o. H)MM/100 MMg	i eet * aHten)MMg
-0V01	0V07	5 i 1 0VRU
★★	★	5 i 2 0V67



hOoatr Ee: _____

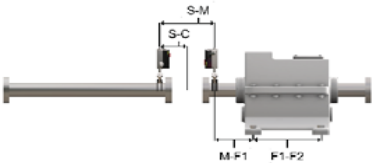
5 86BZp hpPX(



6 L X(yZl	hBL I Pi ypY
6 L X(yZl b)MMg	---
h-6)MMg	c7
h-5)MMg	1R0
5-i 1)MMg	, 00
5 i 1-i 2)MMg	720

)hgpMQmhaz

)5 gl eaFAf



PL ypl 8T6p)p8hx-y8hpl g



I (5 1700

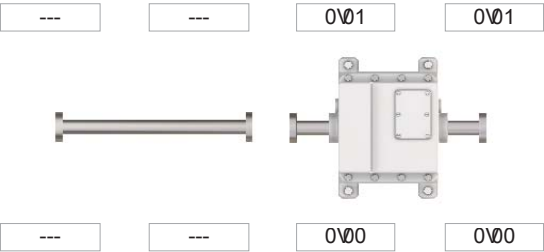
	L znet)MMg	8o. l)MM/100 MMg
8 GgCaFl)dg	0V0,	0V0,
pf GgHot)dg	0V07	0V07

PBpl 5 8y 6L 5 (pTh8PZ T



* pl PZ8y Li i hpP)MMg	---
BL I ZL TP8y Li i hpP)MMg	---
* pl PZ8y 8Tl yp)MM/100 MMg	---
BL I ZL TP8y 8Tl yp)MM/100 MMg	---

hLi Pi LLP



TL Pph



***DRIVE SHAFT
ALIGNMENT AFTER

FOR

COOLING TOWER
CELL 2***

HOI ZNOTPAL I E(OI P

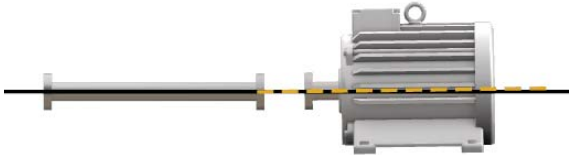
* EI PZCAL



Feet * alues)mmg

MF1 0V06

MF2 0V14



9as found results

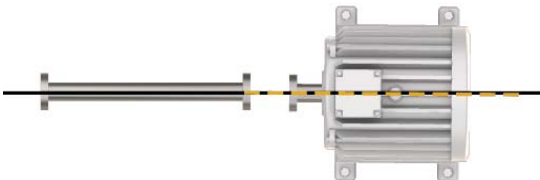
HOI ZNOTPAL



Feet * alues)mmg

MF1 -0V0R

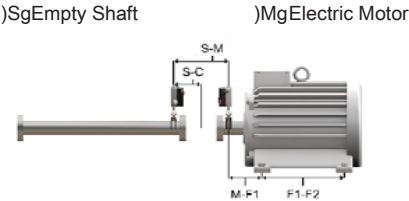
MF2 -0V0,



Si. nature: _____

MACHZ E SEPU(

COU(LZTG	SHOI P FLEX
COU(LZTG Ø)mmg	---
S-C)mmg	, 0
S-M)mmg	140
M-F1)mmg	R20
MF1-F2)mmg	450



POLEI ATCE)EASY-LASEI g

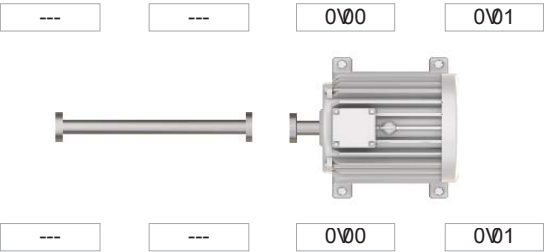
I (M 1500

	Offset)mmg	An. le)mm/100 mmg
Acceptable)9g	0V0,	0V0,
Excellent)99g	0V05	0V05

PHEI MAL COM(ETSAPZOT

* EI PZCAL OFFSEP)mmg	---
HOI ZNOTPAL OFFSEP)mmg	---
* EI PZCAL ATGLE)mm/100 mmg	---
HOI ZNOTPAL ATGLE)mm/100 mmg	---

SOPFPOOP



TOPES

i u NTPu () Mr Nsgu N)

ds N) BMr



feet da ffeL .pp V
Cf 1 0921
Cf 2 0923

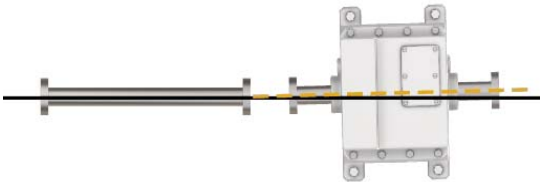


SaL GHyUBLHFL

i u NTPu () Mr



feet da ffeL .pp V
Cf 1 0922
Cf 2 092R



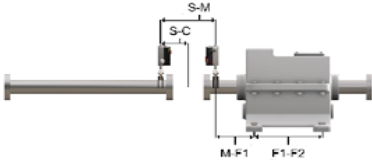
hZ yathB: _____

Cmbi T (s hs) Xg

ouXgr T c	hi uN) frsY
ouXgr T c b .pp V	---
h-o .pp V	R0
h-C .pp V	140
C-f 1 .pp V	R00
Cf 1-f 2 .pp V	A20

.hVsp ntEhhaG

.CVc eaBn5



) ursNM(os .sMhx-rMhsNV

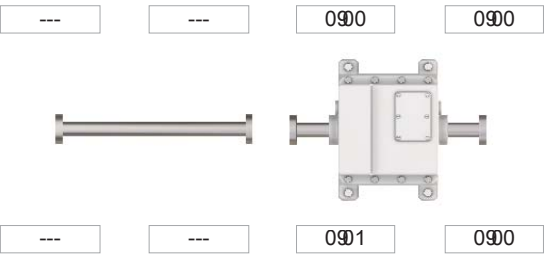
NgC 1A00

	u Get .pp V	My* fe .pp /100 pp V
M , enta6fe .S/	090R	090R
s5, e ffeyt .SS/	090A	090A

) i sNCMr ouCgs(hM) U (

dsN) BMr uffhs) .pp V	---
i u NTPu () Mr uffhs) .pp V	---
dsN) BMr M(crs .pp /100 pp V	---
i u NTPu () Mr M(crs .pp /100 pp V	---

huf) fuu)



(u) sh

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Tel. 038-017-951 TAX ID 0105557096531

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