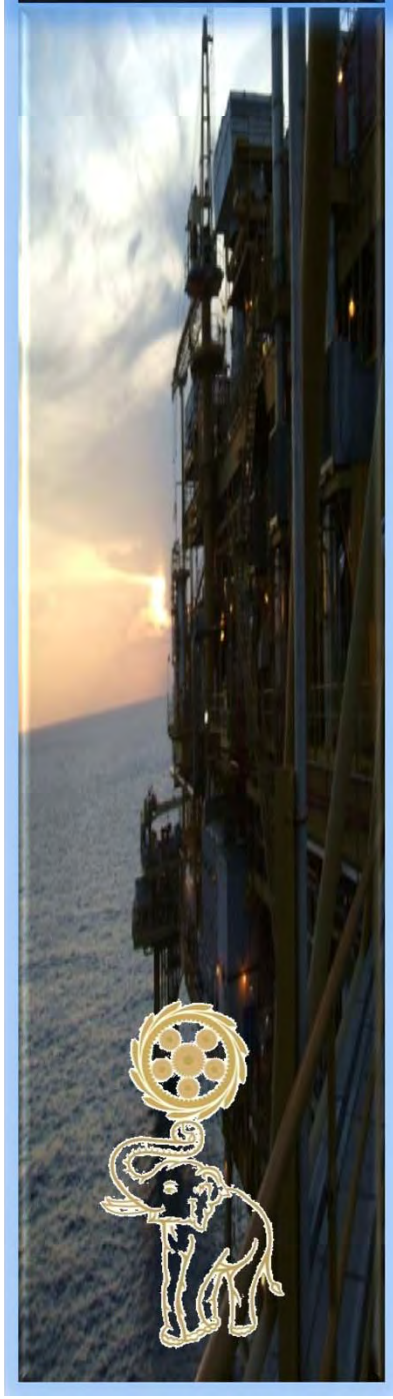
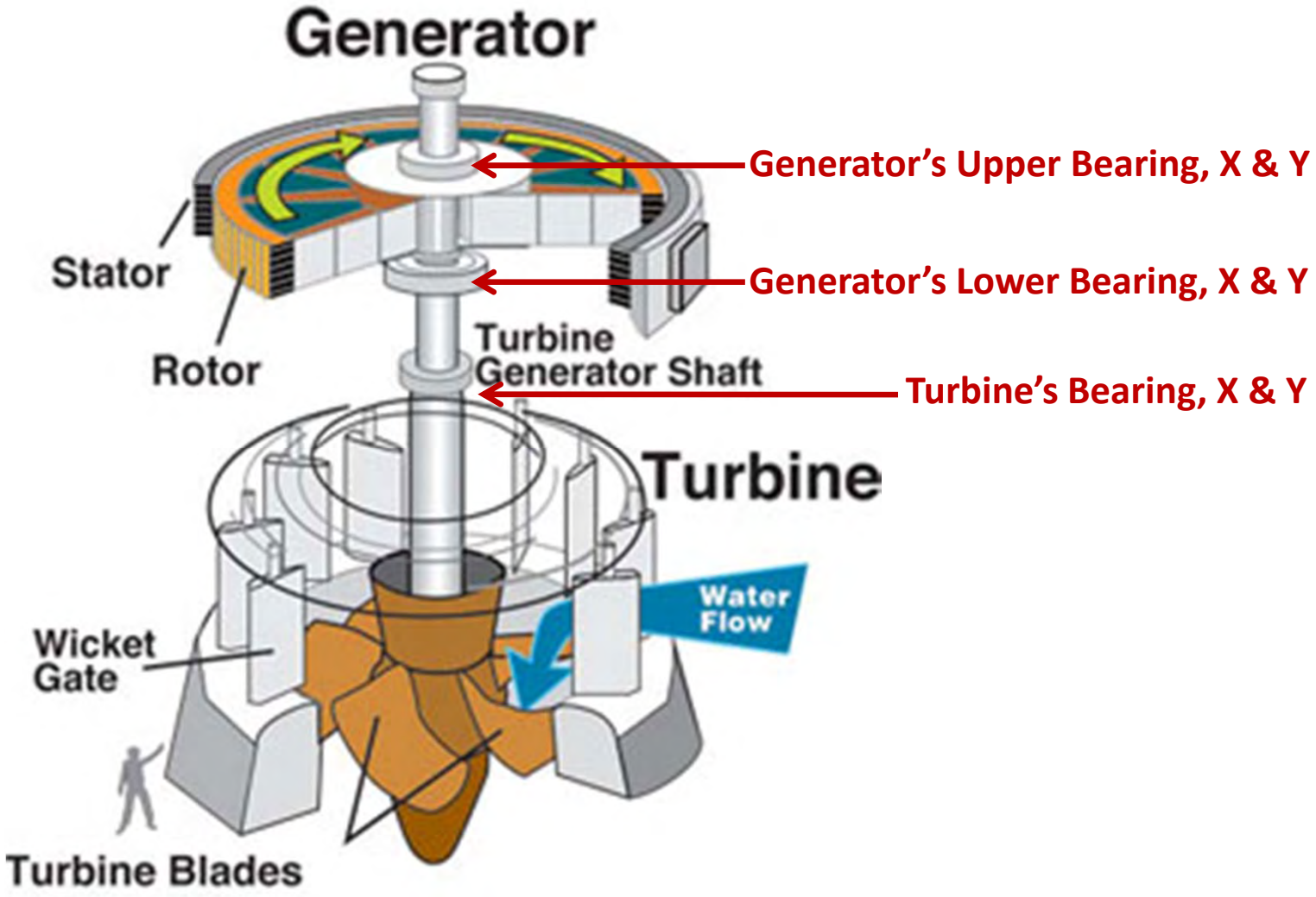


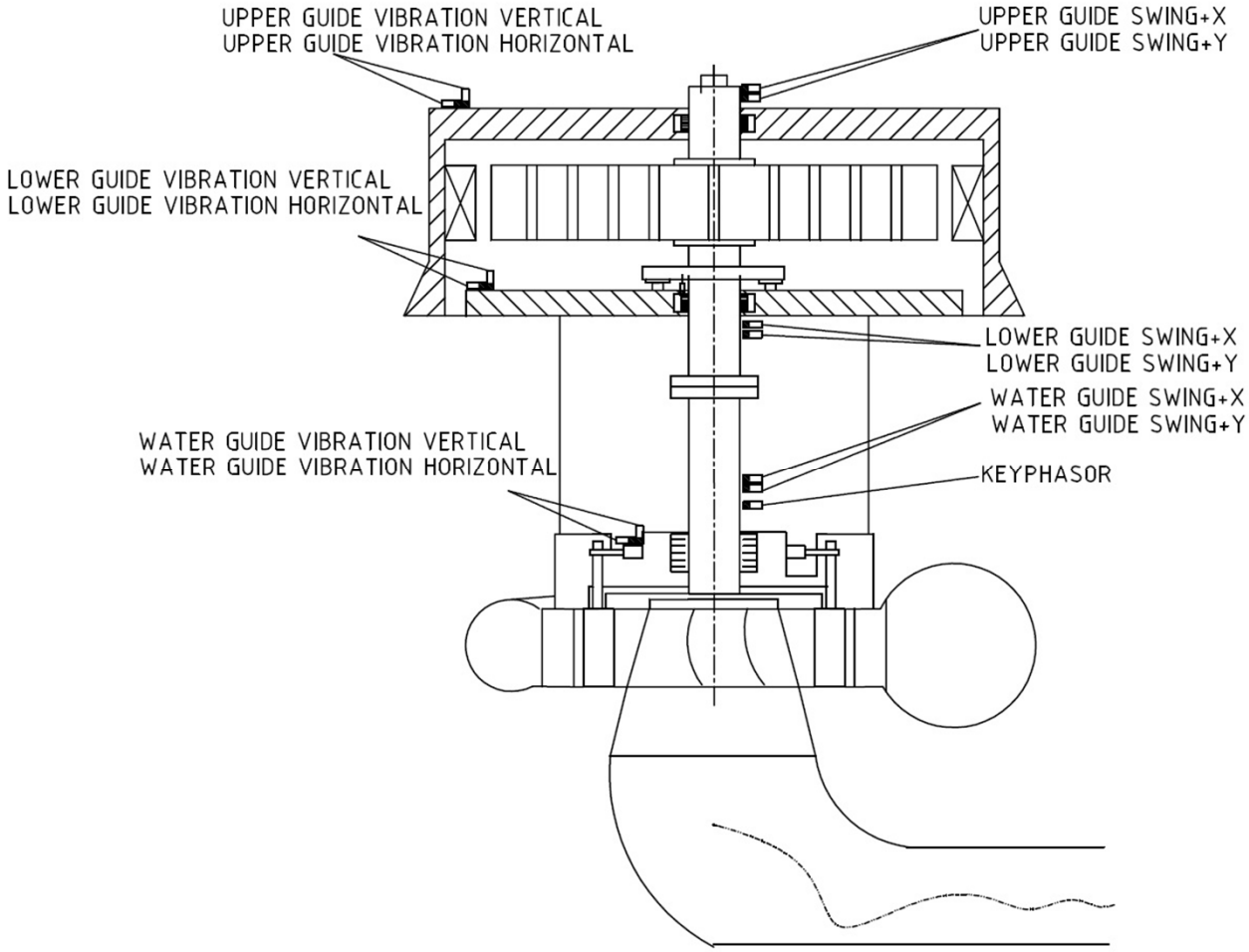
การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย
โรงไฟฟ้าลำตะคองชลภาวัฒนา
Electricity Generating Authority of Thailand
Lamtakong Cholapa Wattana Hydro Power Plant

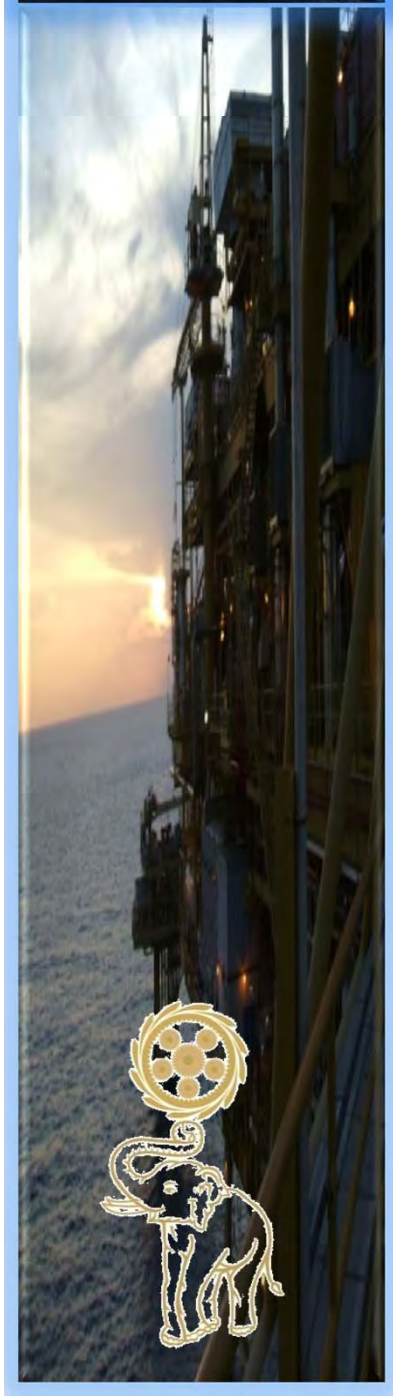
- The Machines are 2 Hydro Turbines.
- There are only 2-3 old and simple vibration transmitters per Turbine.
- The Vibration transmitter didn't work properly in some time.
- The customer contacted us to propose a full vibration system as well as other monitoring system to protect and monitor the Turbine/Generator health.
- We propose all Shaft Vibration, Casing Vibration, LVDT (Case Expansion) and Air Gap monitoring for Turbine's Rotor.
- The additional condition is the new system must be able to integrate with their existing control system.

Typical Turbine & Generator Vibration Installation



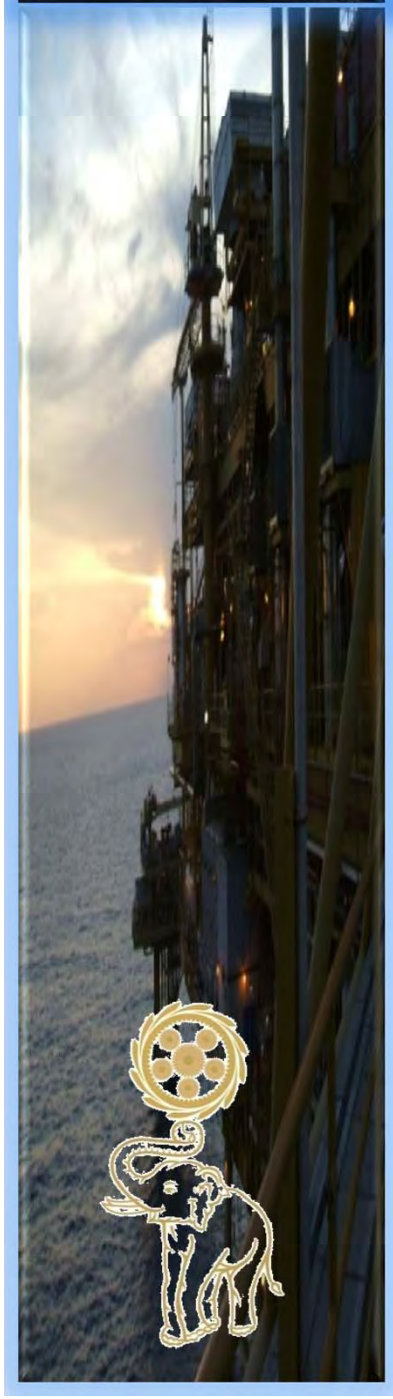
Typical Turbine & Generator Vibration Installation



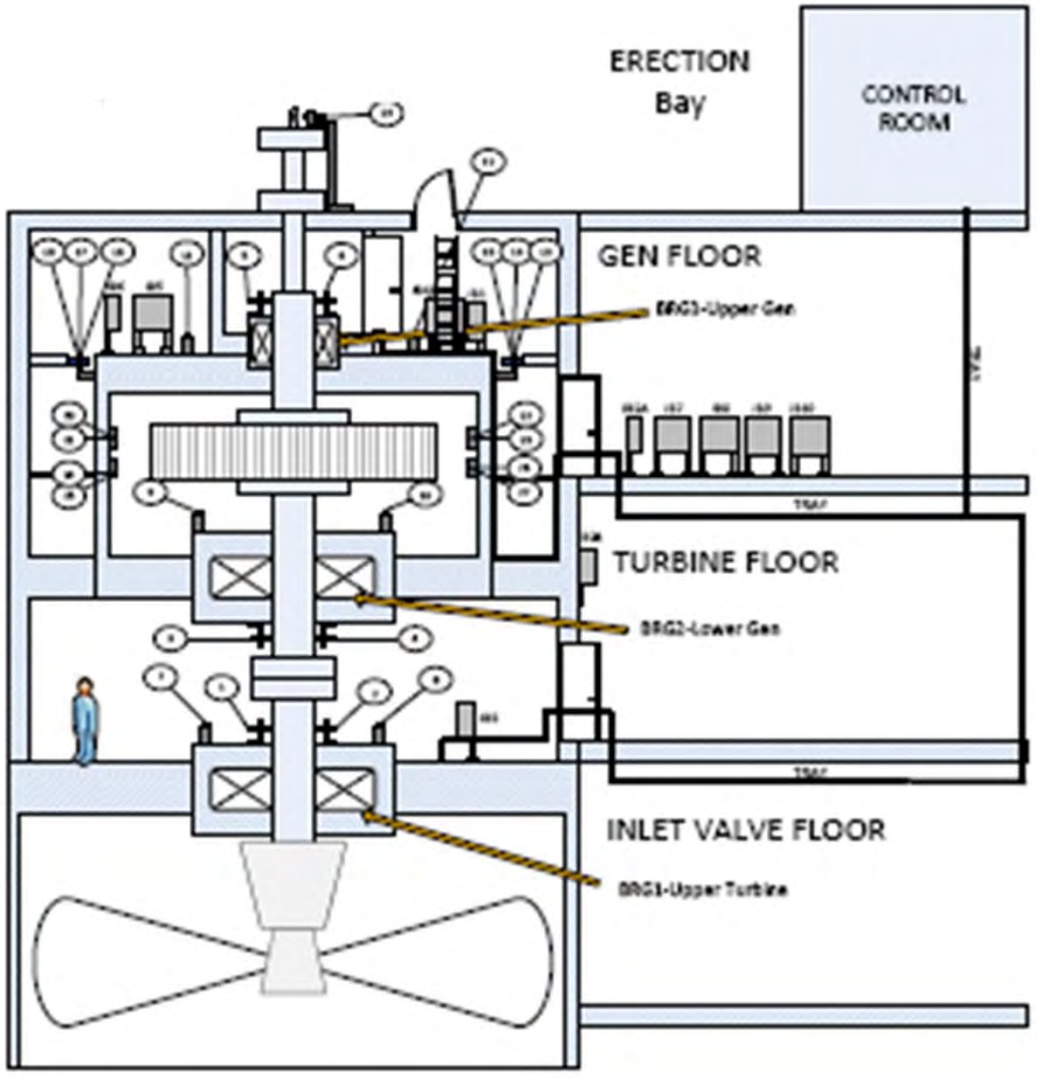


Turbine & Generator Vibration Location

Item	Description	Sensor Type	Sensor Series	Terminated on
1	Upper Turbine - Disp - X	Eddy Current Probe	PRS04	JB3
2	Upper Turbine - Disp - Y	Eddy Current Probe	PRS04	JB3
3	Lower Gen - Disp - X	Eddy Current Probe	PRS04	JB2B
4	Lower Gen - Disp - Y	Eddy Current Probe	PRS04	JB2B
5	Upper Gen - Disp - X	Eddy Current Probe	PRS04	JB1
6	Upper Gen - Disp - Y	Eddy Current Probe	PRS04	JB1
7	Upper Turbine - Vel - Horz	Piezo Velometer	PZV2	JB3
8	Upper Turbine - Vel - Vert	Piezo Velometer	PZV2	JB3
9	Lower Gen - Vel - Horz	Piezo Velometer	PZV2	JB2A
10	Lower Gen - Vel - Vert	Piezo Velometer	PZV2	JB2A
11	Upper Gen- Vel - Horz	Piezo Velometer	PZV2	JB1
12	Upper Gen - Vel - Vert	Piezo Velometer	PZV2	JB1
13	Upper Gen - Case Expansion 1	LVDT	SX20MECR	JB4
14	Upper Gen - Case Expansion 2	LVDT	SX20MECR	JB4
15	Upper Gen - Case Expansion 3	LVDT	SX20MECR	JB5
16	Upper Gen - Case Expansion 4	LVDT	SX20MECR	JB5
17	Upper Gen - Case Expansion 5	LVDT	SX20MECR	JB6
18	Upper Gen - Case Expansion 6	LVDT	SX20MECR	JB6
19	Key Phasor	Eddy Current Probe	PRS04	JB1
20	Gen Air Gap 1		AFT-550	JB7
21	Gen Air Gap 2		AFT-550	JB7
22	Gen Air Gap 3		AFT-550	JB8
23	Gen Air Gap 4		AFT-550	JB8
24	Gen Air Gap 5		AFT-550	JB9
25	Gen Air Gap 6		AFT-550	JB9
26	Gen Air Gap 7		AFT-550	JB10
27	Gen Air Gap 8		AFT-550	JB10



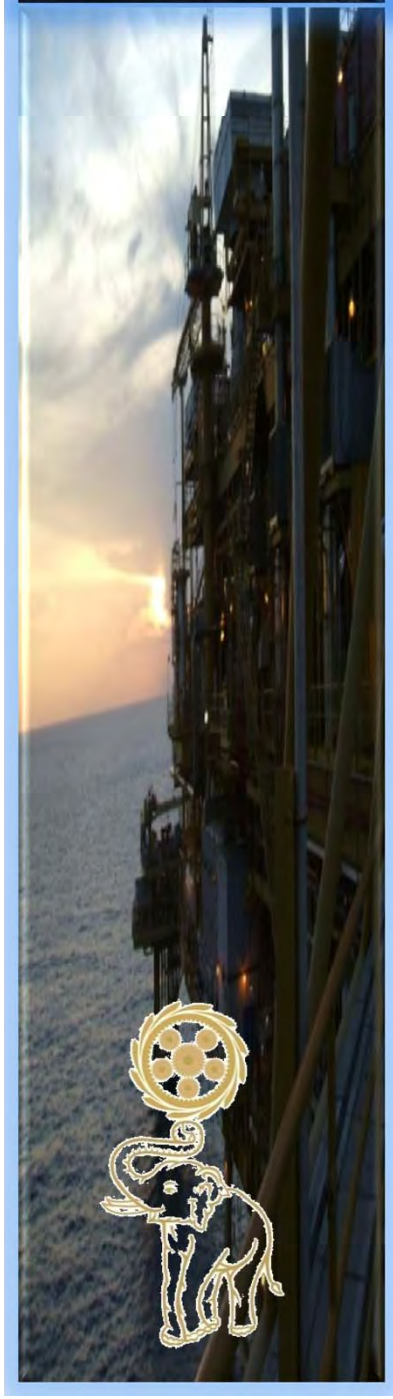
System Layout



AST







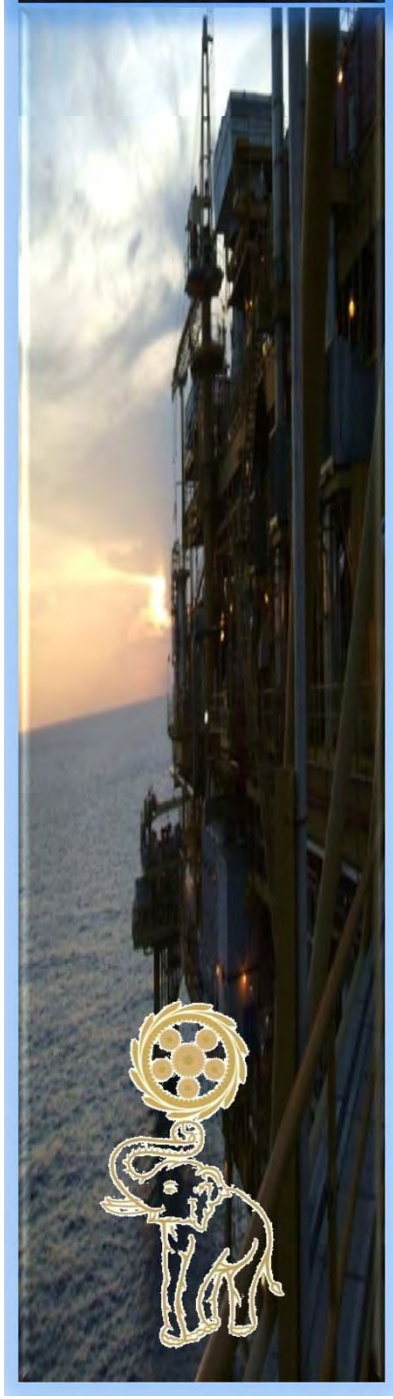
Installation point



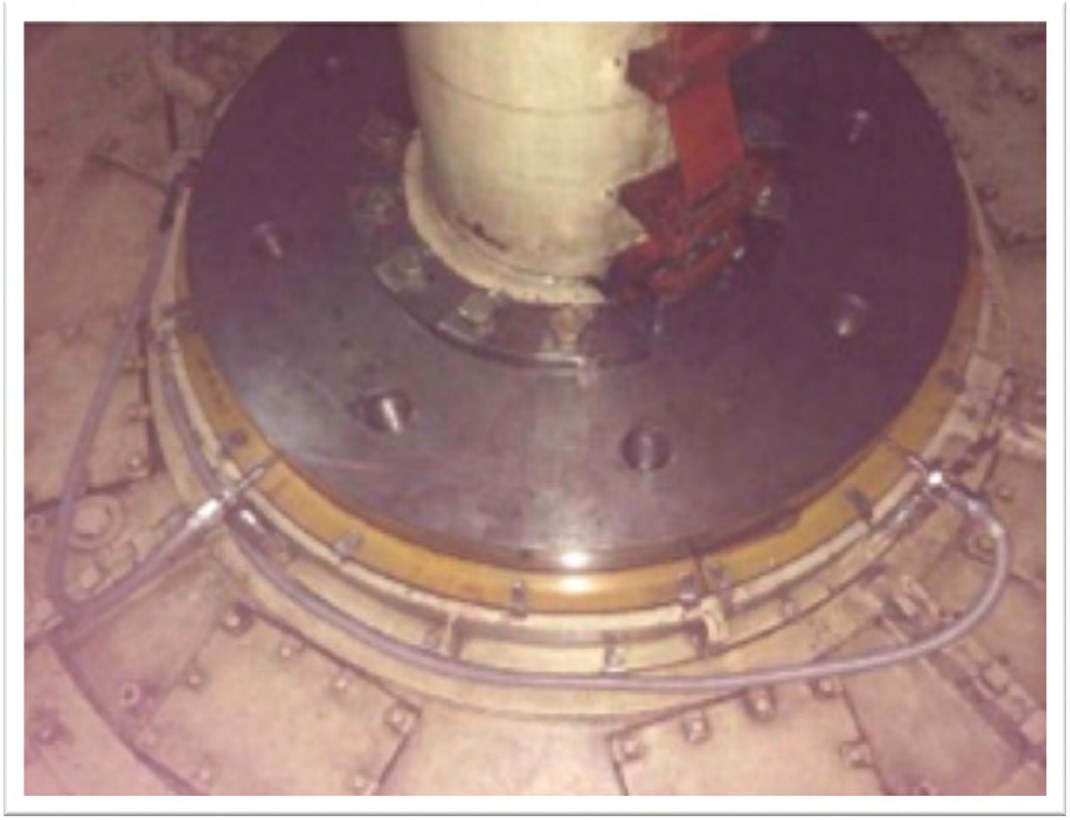
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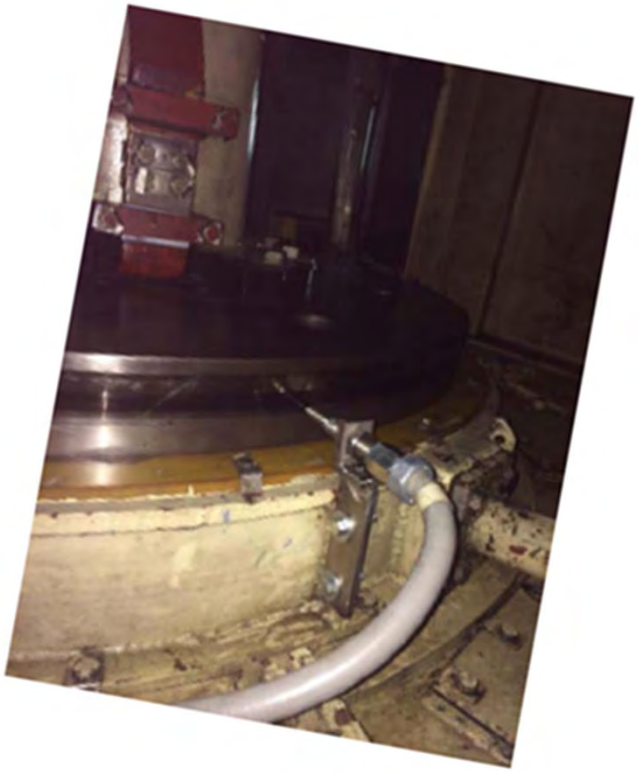


Key Phaser





Upper Gen – Displacement - Y

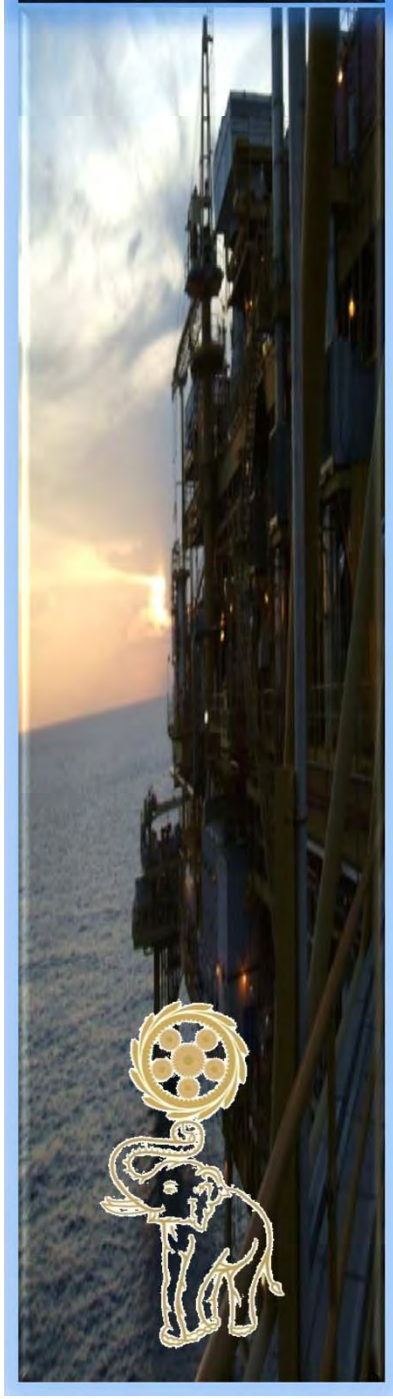


Upper Gen – Displacement - X

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Upper Gen – Velocity Vertical





Upper Gen – Velocity Horizontal

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Upper Gen
Case Expansion 1

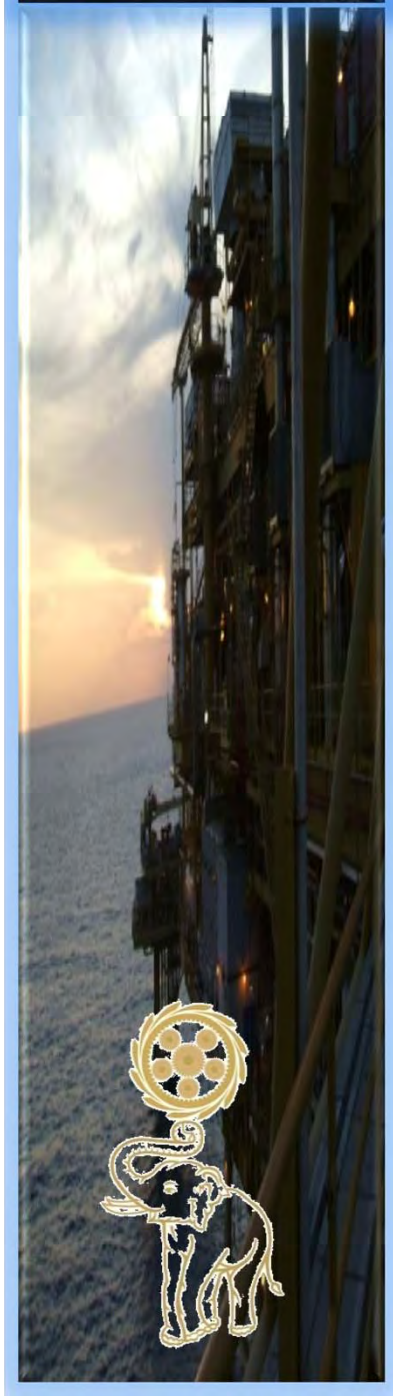
Upper Gen
Case Expansion 2



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Upper Gen – Case
Expansion 3





Upper Gen – Case
Expansion 4

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Upper Gen
Case Expansion 5

Upper Gen
Case Expansion 6



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Lower Gen
Velocity
Horizontal

Lower Gen
Velocity
Vertical



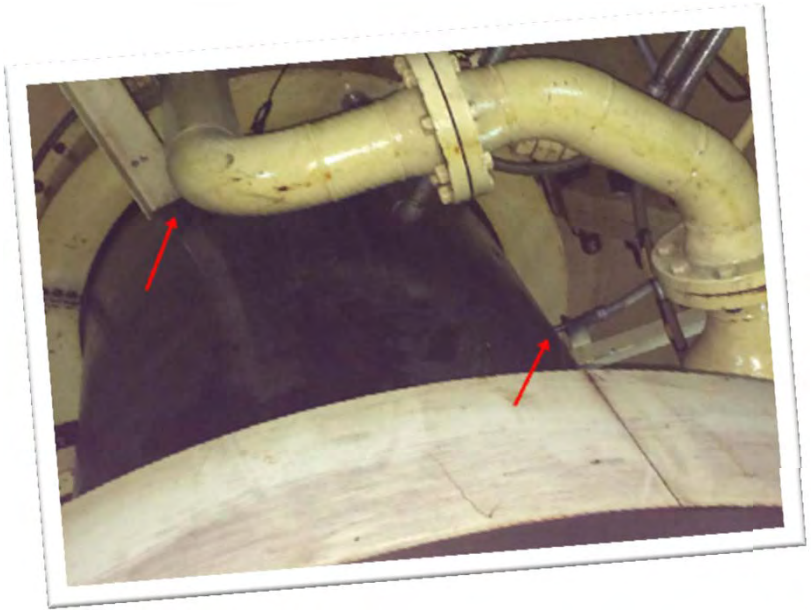
AST

Lower Gen Displacement X & Y





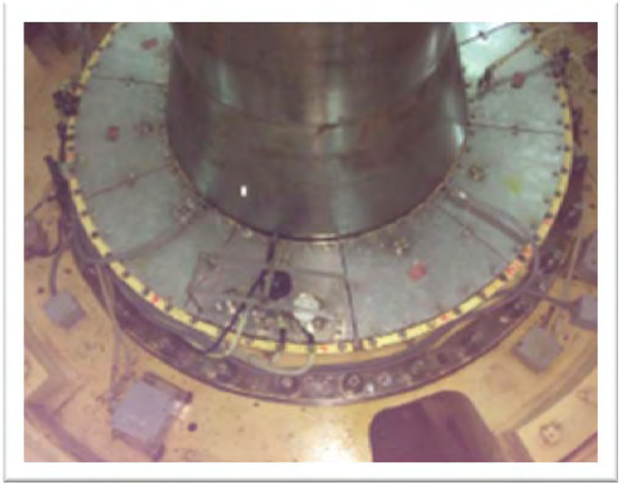
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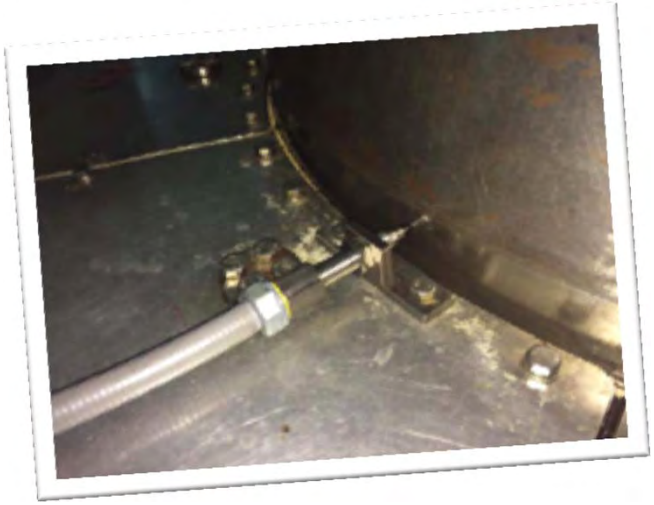


Lower Gen
Displacement
X & Y



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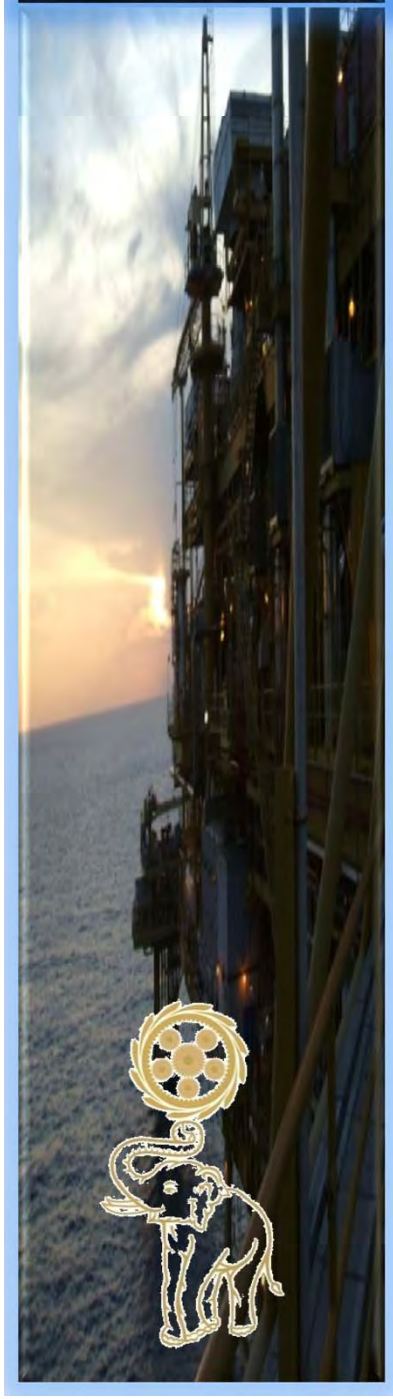


Upper Turbine – Displacement – X & Y

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Upper Turbine
Velocity
Vertical



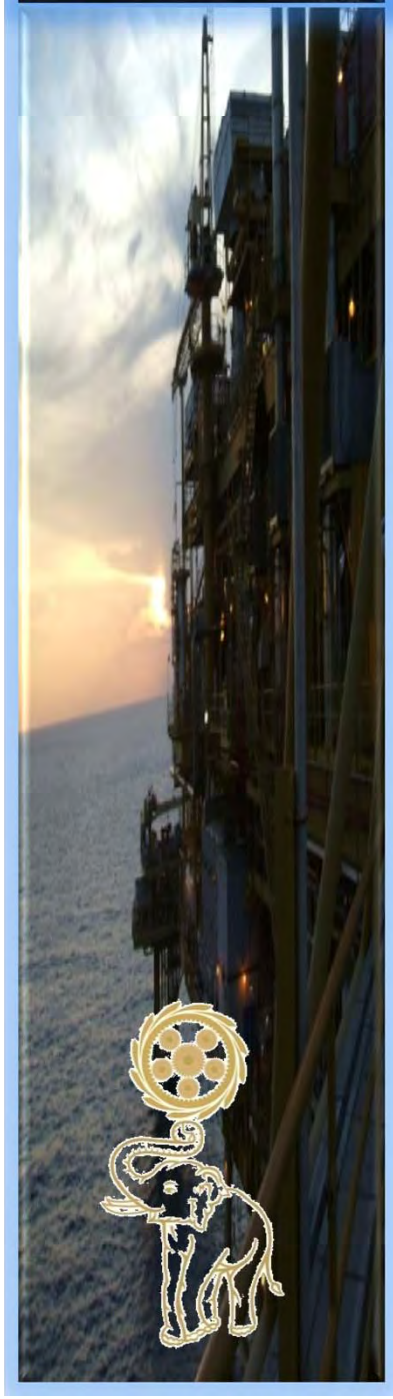


Upper Turbine
Velocity
Horizontal



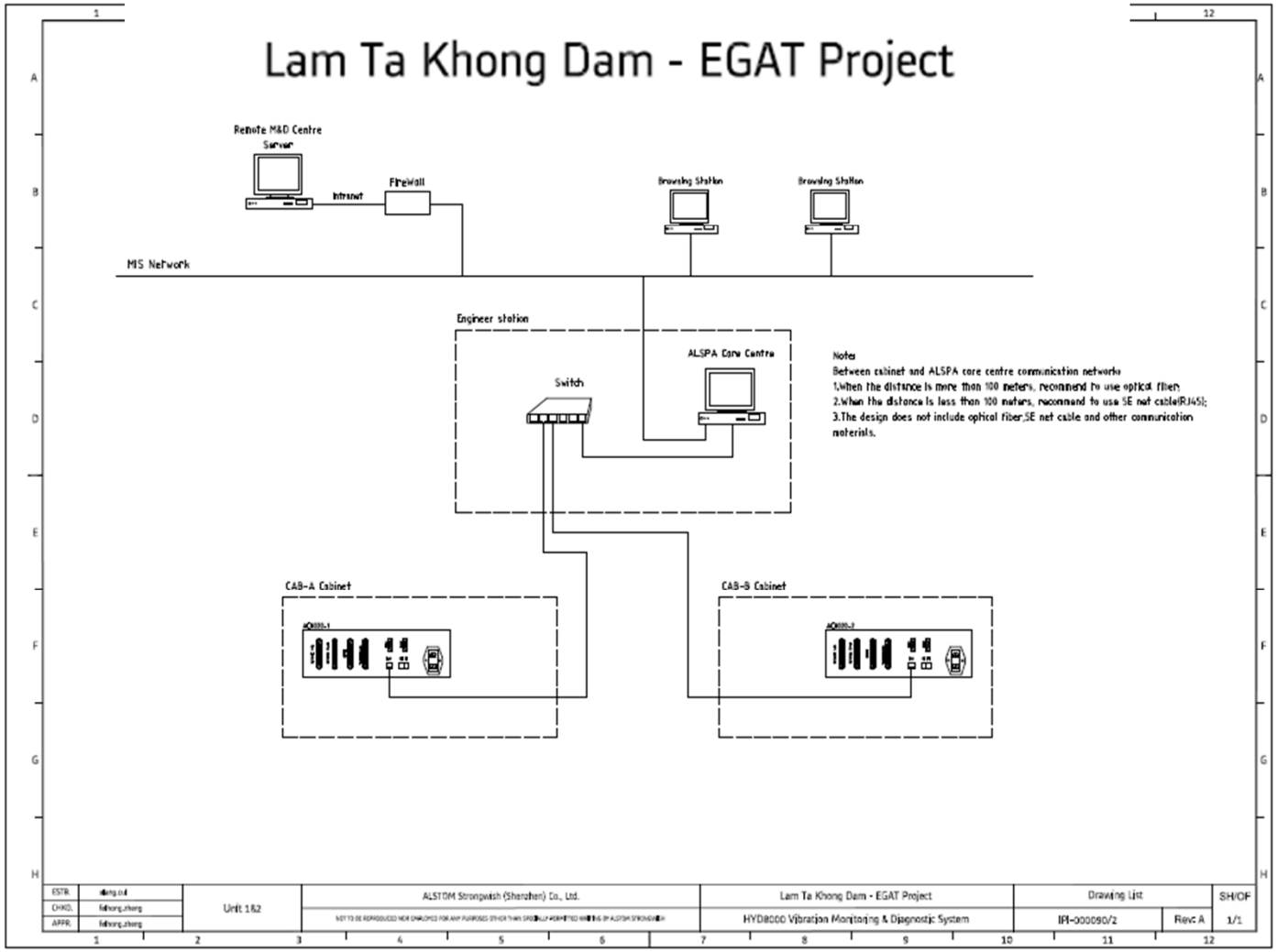




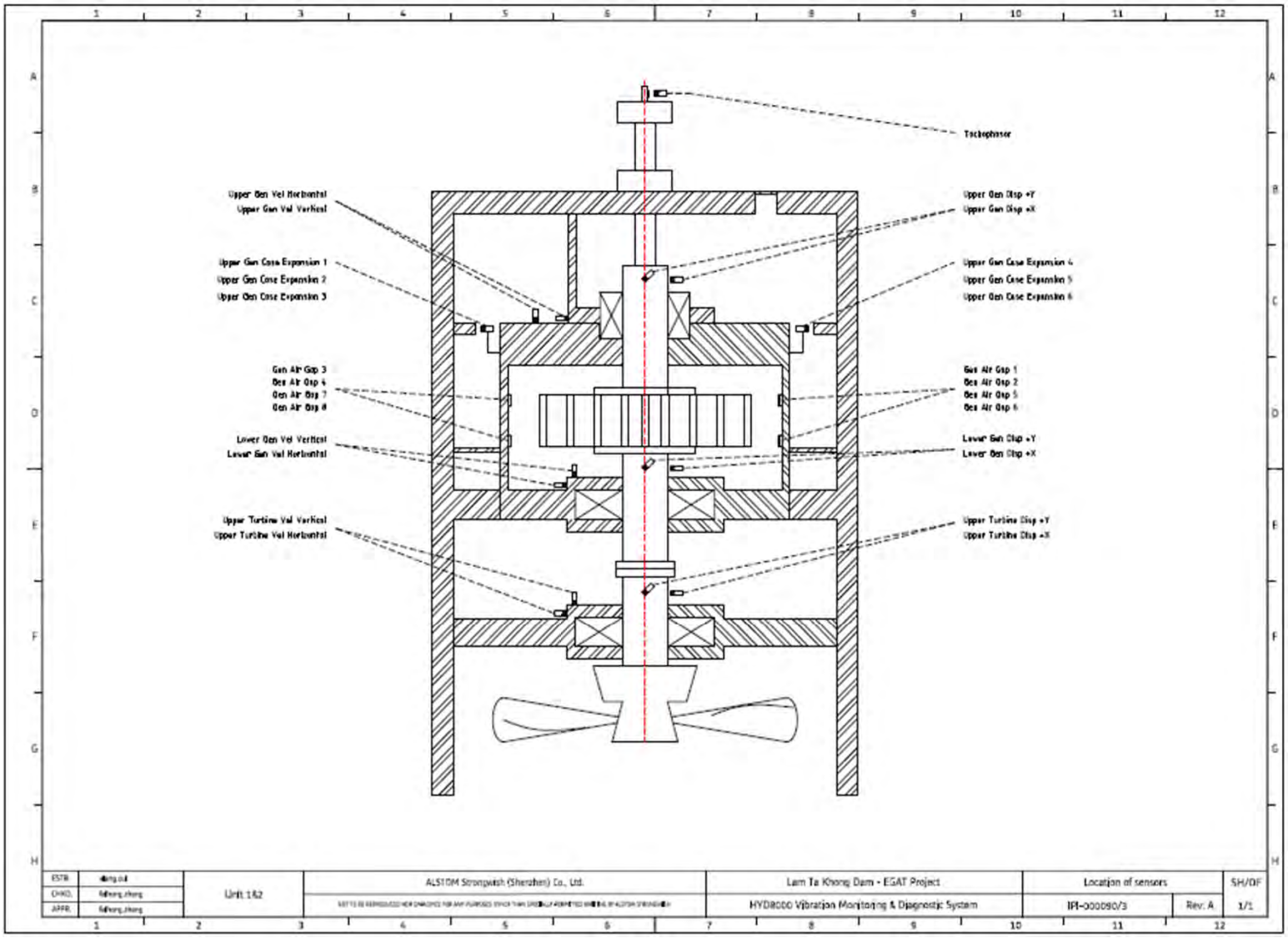


ALSPA Hydro Care HYD8000
Vibration Online Monitoring & Diagnostic System

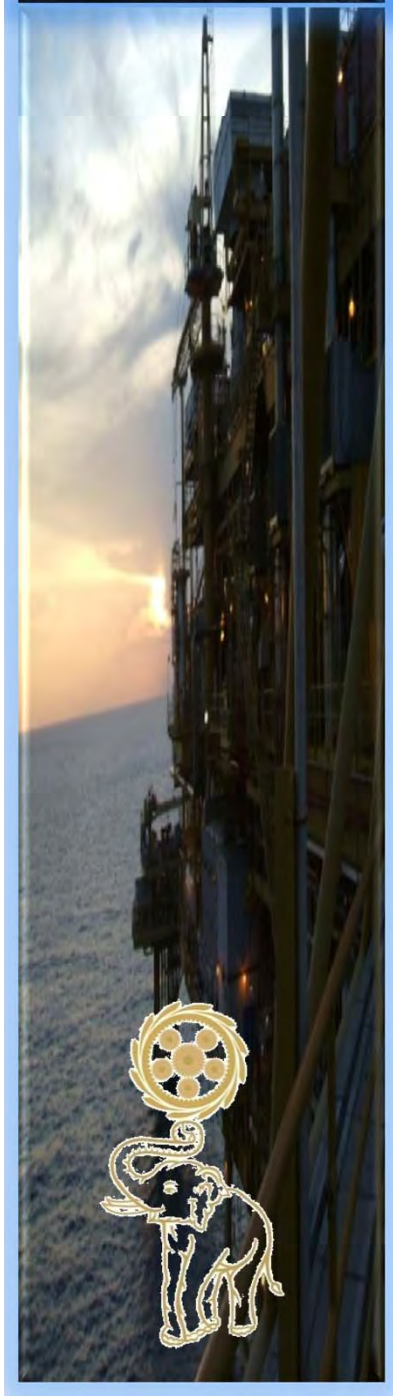
Lam Ta Khong Dam - EGAT Project



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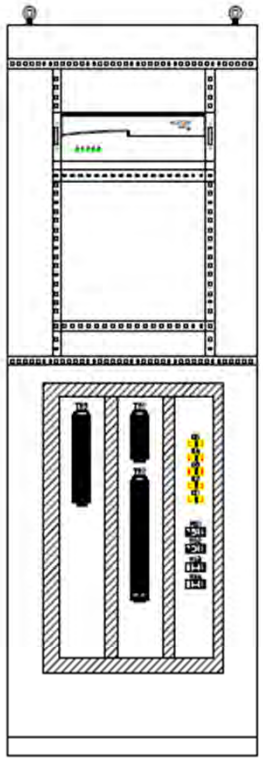


Most Valued Global Provider of Predictive Maintenance Solution

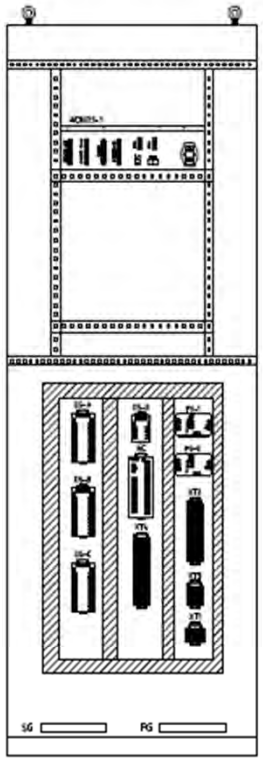




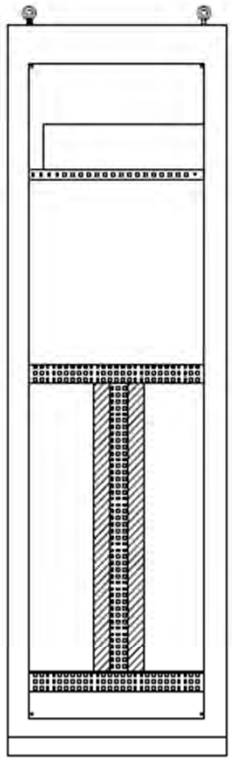
CAB-A



Front View



Rear View



Side View

Pos.	Tag	Name	Description	Amt.
21	AC	Acceleration Signal Connector Overview	SW-ACC12	1
20	PS-1/2	Power Supply	HR-100-24	2
19	PG	Cabinet Signal Grounding Busbar		1
18	SG	Cabinet Frame Grounding Busbar		1
17	Q2`Q5	Miniature AC Circuit Breakers/4A	ABB S202-C4	4
16	Q1	Miniature AC Circuit Breakers/16A	ABB S202-C16	1
15	MS3,MS4	Din-Rail Sockets	Meritk Gerin,2P	2
14	MS1,MS2	Din-Rail Sockets	Meritk Gerin,3P	2
13	TB3	Upper Cpt Cross Expansion signal terminals	UKSN	26
12	TB2	Air-gap signal terminals	UKSN	35
11	TB1	Tachophaser Signal Terminals	UKSTWIN	13
10	XT4	CPM power supply terminals	UKSTIN	22
9	XT3	-24v power supply terminals	ASK1	6
8	XT2	+24v power supply terminals	ASK1	19
7	XT1	AC220V Terminals	WDU2.5	6
6	DS-D	Tachophaser Signal Connector/Power Supply	AS-S05	1
5	DS-C	Process Signal Connector/Power Supply	AS-S01	1
4	DS-B	Vibration Signal Connector/Power Supply	AS-S01	1
3	DS-A	Vibration Signal Connector/Power Supply	AS-S01	1
2	ACM020-1	Data Acquisition Unit	ACM020	1
1	CAB-A	AC6020 cabinet		1

ESTR.	dlong.cd	Unit 1	ALSTOM Strongwish (Shenzhen) Co., Ltd.	Lam Ta Khong Dam - EGAT Project	Cabinet Layout
CHKD.	fdhong.zhong			HYDB000 Vibration Monitoring & Diagnostic System	IPI-000090/4 Rev: A
APPR.	fdhong.zhong				SH/DF 1/2

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