

References

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Appendix

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

SCHEDULE OF TECHNICAL DATA

Control and Instrumentation
Open and Closed Loop Controls
TSP, Section 12.1.2, 12.4

Item	Description	Unit	Data
3	Application Software		
3.1	Application software programming method (Ladder/Statement/Logic Diagram)		Function block
3.2	Execution cycle times for sequence of appl. software	ms	Each program cycle at different speeds. Three priority levels selectable between 10 ms and 2 sec
3.3	Automatic transfer from functional diagram displays to controller readable program code		yes
3.4	Functional diagrams by CAE		yes
3.5	As-built documentation by CAE		yes
4	Standard Application Software Library		
4.1	Function blocks and/or software modules included		yes
5	Other equipment proposed by the Bidder		none
6	Meantime Values		
6.1	Meantime between failure (MTBF)	years	
	(1) Redundant controller system		772 years
	(2) Worst case input/output module		39 years
6.2	Meantime to repair (MTTR) for control system modules		30 min

SCHEDULE OF TECHNICAL DATA

Control and Instrumentation
 Databus System
 TSP, Section 12.1.2, 12.4

Item	Description	Unit	Data
1	Local Bus (Control Cubicle Bus)		
1.1	Maximum number of modules (theoretical)	No.	S100 I/O-modules: 100
1.2	Maximum number of modules (application)	No.	73 (+20% spare capacity)
1.3	Max. length of bus	m	central S100 I/O-modules: 12 m
1.4	Type of bus system		CPU-bus: parallel
1.5	Maximum number of installed controller systems	No.	2 (redundant)
1.6	Clock frequency	MHz	n.a. : FutureBus+ (IEEE 896)
1.7	Theoretical data-transfer rate	kByte/s	n.a. : FutureBus+ (IEEE 896)
1.8	Practical max. data-transfer rate	kByte/s	n.a. : FutureBus+ (IEEE 896)
1.9	Data transmission protocol		n.a. : FutureBus+ (IEEE 896)
1.10	MTBF	years	Bus extension to S100 I/O > 320 years
1.11	MTTR		30 min
2	Mainbus		
2.1	Make and type of mainbus system		ABB Master Bus 300
2.2	Maximum number of nodes (theoretical)	No.	99
2.3	Number of nodes (total)	No.	upon detailed engineering
2.4	Maximum length of bus	m	maximum length between 2 controllers = 4500 m
2.5	Theoretical data-transfer rate	kByte/s	Bus transfer rate = 10 Mbaud
2.6	Practical max. data-transfer rate	kByte/s	Bus transfer rate = 10 Mbaud
2.7	Data consistency checks		IEEE 802,3
2.8	Data transmission protocol		IEEE 802,3
2.9	Redundancy		Yes, separate bus cables
2.10	MTBF	years	> 1000 years
2.11	MTTR		30 min

SCHEDULE OF TECHNICAL DATA

Control and Instrumentation
 Databus System
 TSP, Section 12.1.2. 12.4

Item	Description	Unit	Data
3	Local Area Network		
3.1	Make and type of LAN		TCP / IP protocol
3.2	Max. number of stations (theoretical)	No.	100 10 base 5 30 10 base 2
3.3	Number of stations (practical)	No.	20
3.4	Max. length of bus	m	10 base 5 = 500 m 10 base 2 = 185m
3.5	Number of branches	pcs	100 10 base 5 30 10 base 2
3.6	Theoretical data transfer rate	Mbyte/s	10 Megabits/sec CSMA/CD
3.7	Practical data transfer rate	Mbyte/s	10 Megabits/sec CSMA/CD
3.8	Data consistency protocol		IEEE 802.3
3.9	Data transmission protocol		IEEE 802.3
3.10	MTBF	years	> 1000 years
3.11	MTTR	min.	30 min.
4	LAN-Server		Not applicable
4.1	Make and type		
4.2	Max. number of line inputs	No.	
4.3	Max. number of line outputs	No.	
4.4	Number of line inputs (appl.)	No.	
4.5	Number of line outputs (appl.)	No.	
4.6	Buffer size	kbyte	

VOLUME 10

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OF THAILAND

NONTHABURI, THAILAND



KRABI THERMAL PLANT UNIT 1

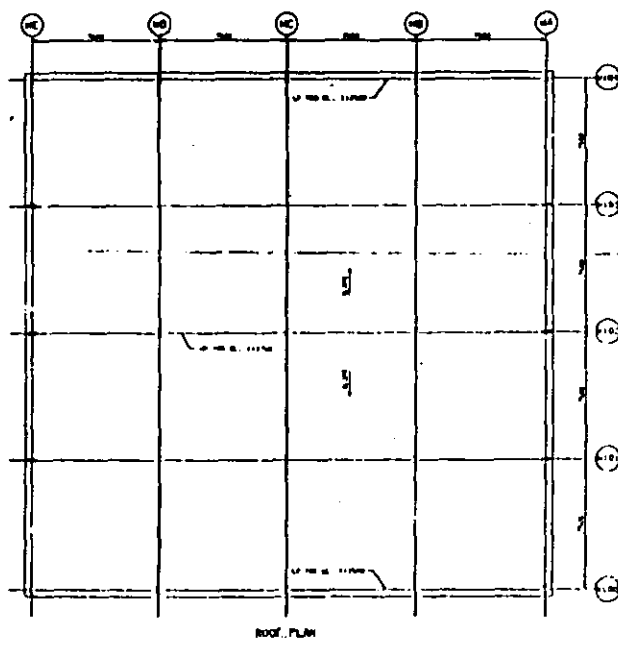
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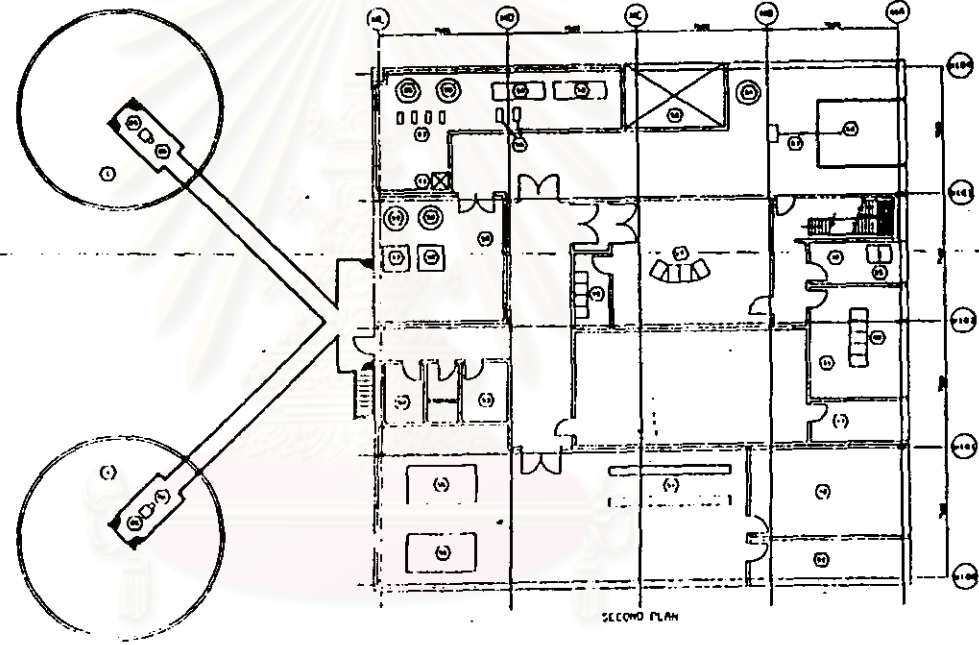
ELECTRICITY GENERATING AUTHORITY OF THAILAND

KRABI THERMAL PLANT UNIT 1

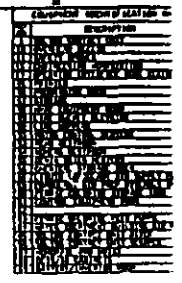
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PLANT ARRANGEMENT		00049-114F-EK2016	CYCLE MAKE-UP AND STORAGE	00049-114C-EK2030	WASTEWATER COLLECTION AND TREATMENT - SHEET 4
00049-CUJ4-EK1001	GENERATION BUILDING ARRANGEMENT GROUND FLOOR EL. 0.00	00049-114C-EK2017A	CONDENSER WINE CLEANING	00049-CF01-EK2044	SITE FUEL OIL STORAGE AND SUPPLY - SHEET 1
00049-CUJ4-EK1002	GENERATION BUILDING ARRANGEMENT MEZZANINE FLOOR EL. 6.150	00049-114C-EK2017B	FIRE ALARMS WATER	00049-CF01-EK2044	SITE FUEL OIL STORAGE AND SUPPLY - SHEET 2
00049-CUJ4-EK1003	GENERATION BUILDING ARRANGEMENT OPERATING FLOOR EL. 11.100	00049-114D-EK2018	WATER WASH	00049-L14C-EK2045	HOT WATER
00049-CUJ4-EK1004	GENERATION BUILDING ARRANGEMENT SECTION ELEVATION	00049-114E-EK2019	CONDENSER AIR EXTRACTION	00049-CPE-EK2046	AUXILIARY BOILER CHEMICAL FEED
00049-CUJ4-EK1005	GENERAL LAYOUT OF FGD	00049-114A-EK2020	CHEMICAL CLEANING	00049-CSTC-EK2047	SITE FIRE PROTECTION
00049-CUJ4-EK1006	WATER TREATMENT AREA GROUND FLOOR	00049-114A-EK2021	AUXILIARY STEAM	00049-CUJ4-EK2048	HOT WATER
00049-CUJ4-EK1007	WATER TREATMENT AREA SECOND FLOOR & ROOF PLAN	00049-114B-EK2022	AUXILIARY MILLER FUEL OIL SUPPLY	00049-L14C-EK2049	FIRE PROTECTION WATER SUPPLY AND STORAGE
00049-CUJ4-EK2001	HEAT BALANCE DIAGRAM	00049-114C-EK2023	WATER QUALITY CONTROL SYSTEM AND ANALYSIS	00049-114C-EK2049	MILLER WANTS AND DRAWING
PIPING AND INSTRUMENT DIAGRAMS		00049-114D-EK2024	MILLER COMPRESSOR AIR	00049-114C-EK2051	WATER SUPPLY
00049-CUJ4-EK2001	LEGEND	00049-114E-EK2025	IONIZER WATE	00049-114C-EK2052	DRY AIR LAY-UP
00049-114C-EK2002	FUEL WASH WATER SUPPLY	00049-114E-EK2026	WATER STEAM	00049-114C-EK2053	FUEL GAS WASH
00049-114C-EK2003	FUEL WASH WATER PROCESSING SYSTEM	00049-114E-EK2027	WASTE DRAINING	00049-114C-EK2054	FUEL GAS SUPPLY
00049-114C-EK2004	HEAVY METALS PREPARATION SYSTEM	00049-114E-EK2028	WASTE STEAM	ELECTRICAL DRAWINGS	
00049-114A-EK2005A	STATION AIR - SHEET 1	00049-114E-EK2029	TEMPERATURE MOUNT	00049-114C-EK2055	GENERATION TERMINAL DIAGRAM OVERALL SHEET 1
00049-114A-EK2005B	STATION AIR - SHEET 2	00049-114E-EK2030	HIGH PRESSURE EXTRACTION	00049-114C-EK2056	REVERSE HEATING THERMAL PLANT
00049-114B-EK2006A	CONTROL AIR - SHEET 1	00049-114E-EK2031	LOW PRESSURE EXTRACTION	00049-114C-EK2057	6.6 KV DISTRIBUTION BOARD UNIT SUPPLY BASIC SINGLE-LINE DIAGRAM
00049-114B-EK2006B	CONTROL AIR - SHEET 2	00049-114E-EK2032	EXHAUST FAN TRIP AND LIFTING	00049-114C-EK2058	6.6 KV DISTRIBUTION BOARD STATION SERVICE BY BASIC SINGLE-LINE DIAGRAM
00049-114C-EK2007A	FLUE GAS DESULFURIZATION - SHEET 1	00049-114E-EK2033	WATER WASH WASTE DRAINING	00049-114C-EK2059	GENERATION AND TRANSFORMER WASTING AND RELAYING DIAGRAM
00049-114C-EK2007B	FLUE GAS DESULFURIZATION - SHEET 2	00049-114E-EK2034	LOW PRESSURE HEATER DRAINING	00049-114C-EK2060	MOTOR SUPPLY SYSTEM BASIC SINGLE-LINE DIAGRAM
00049-114C-EK2007C	FLUE GAS DESULFURIZATION - SHEET 3	00049-114E-EK2035	TURBINE WASTE AND DRAINING - SHEET 1	00049-114C-EK2061	600V MAIN DISTRIBUTION BOARD FEEDER BASIC CONTROL DIAGRAM
00049-114C-EK2008	INDUCTOR DRAIN	00049-114E-EK2036	TURBINE TRIPS AND DRAINING - SHEET 2	00049-114C-EK2062	600V MAIN DISTRIBUTION BOARD MCC FEEDER BASIC CONTROL DIAGRAM
00049-114A-EK2009A	BUILDING DRAIN AND EQUIPMENT DRAIN	00049-114E-EK2037	TURBINE OIL OIL	00049-114C-EK2063	600V MAIN DISTRIBUTION BOARD MOTOR FEEDER BASIC CONTROL DIAGRAM
00049-114A-EK2009B	BUILDING DRAIN AND EQUIPMENT DRAIN	00049-114E-EK2038	GENERATED CYCLING AND PURGE - SHEET 1	00049-114C-EK2064	MCC FEEDER STANDARD CONTROL DIAGRAM
00049-114C-EK2010A	CLOSED CYCLE COOLING WATER - SHEET 1	00049-114E-EK2039	REHEATED COOLING AND PURGE - SHEET 2	00049-114C-EK2065	MOTOR CONTROL CENTER STANDARD SINGLE LINE DIA
00049-114C-EK2010B	CLOSED CYCLE COOLING WATER - SHEET 2	00049-114C-EK2040	SERVICE WATER SUPPLY AND STORAGE - SHEET 1	00049-114C-EK2066	MCC BUS-TIE STANDARD CONTROL DIAGRAM
00049-114B-EK2011A	BURNER FUEL OIL SUPPLY - SHEET 1	00049-114B-EK2041	SERVICE WATER SUPPLY AND STORAGE - SHEET 2	00049-114C-EK2067	MCC NORMAL STARTER STANDARD CONTROL DIAGRAM
00049-114B-EK2011B	BURNER FUEL OIL SUPPLY - SHEET 2	00049-114B-EK2042	SERVICE WATER TREATMENT - SHEET 1	00049-114C-EK2068	MCC REVERSIBLE STARTER STANDARD CONTROL DIAGRAM
00049-114B-EK2011C	BURNER FUEL OIL SUPPLY - SHEET 3	00049-114B-EK2043	SERVICE WATER TREATMENT - SHEET 2	00049-114C-EK2069	6.6 KV MOTOR FEEDER STANDARD CONTROL DIAGRAM
00049-114A-EK2012A	BUILDING FIRE PROTECTION - SHEET 1	00049-114B-EK2044	SERVICE WATER TREATMENT - SHEET 3	CIVIL DRAWINGS	
00049-114A-EK2012B	BUILDING FIRE PROTECTION - SHEET 2	00049-114B-EK2045	CYCLE MAKE-UP TREATMENT - SHEET 1	00049-114C-EK2070	LOCATION MAP
00049-114A-EK2013	BOILER FEEDWATER - SHEET 1	00049-114B-EK2046	CYCLE MAKE-UP TREATMENT - SHEET 2	00049-114C-EK2071	SITE ARRANGEMENT
00049-114A-EK2013B	BOILER FEEDWATER - SHEET 2	00049-114A-EK2047	CHEMICAL WASTE COLLECTION AND TREATMENT	00049-114C-EK2072	SITE PROFILE
00049-114C-EK2014	CONDENSATE - SHEET 1	00049-114C-EK2048	SANITARY WASTEWATER AND TREATMENT	00049-114C-EK2073	SITE ROAD PLAN
00049-114C-EK2015	CONDENSATE - SHEET 2	00049-114C-EK2049	WASTEWATER COLLECTION AND TREATMENT - SHEET 1	00049-114C-EK2074	TYPICAL SECTION OF ROAD
		00049-114C-EK2050	WASTEWATER COLLECTION AND TREATMENT - SHEET 2	00049-114C-EK2075	TOPOGRAPHICAL MAP



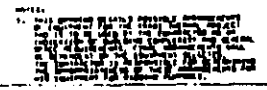
ROOF PLAN

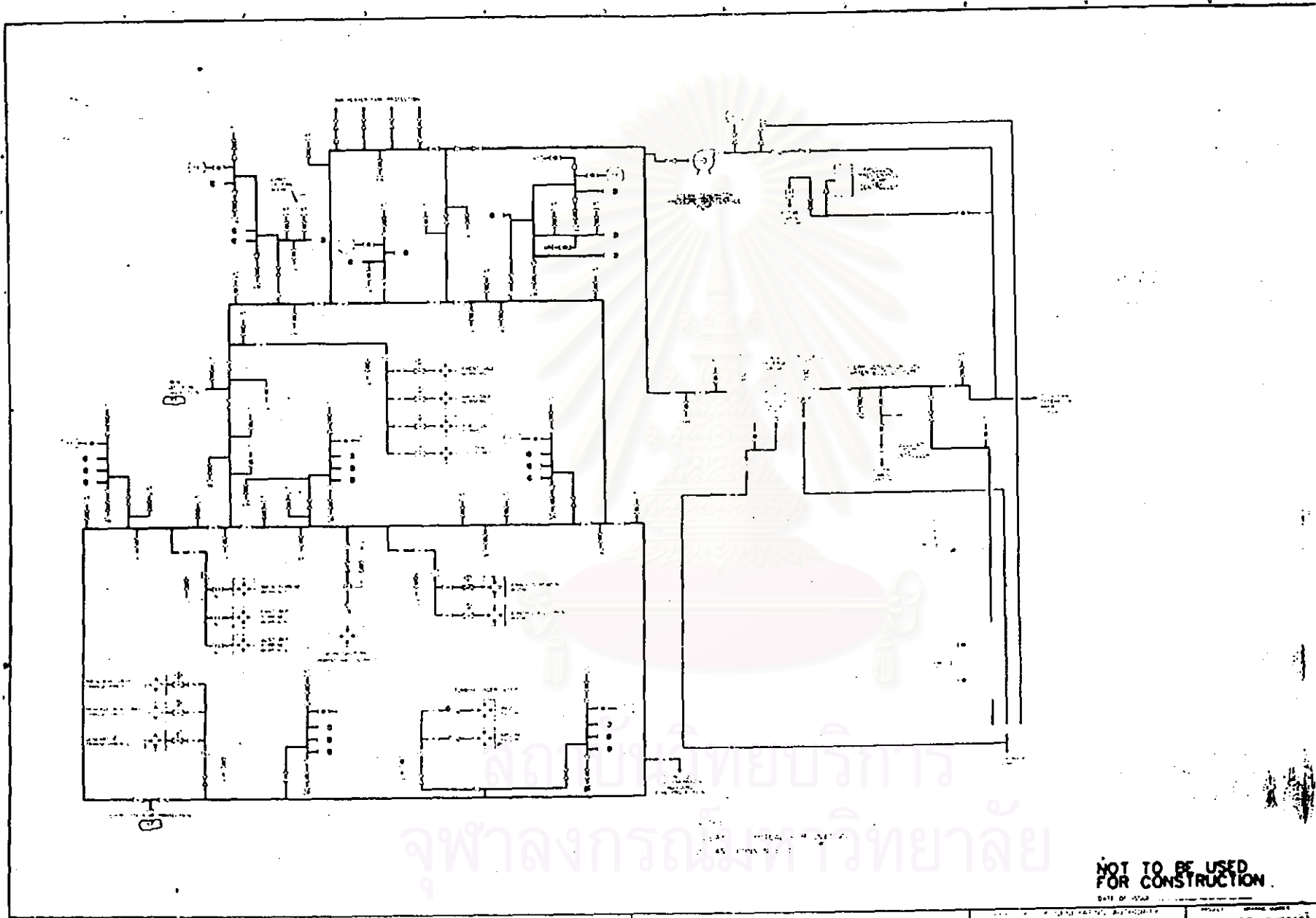


SECOND FLOOR PLAN



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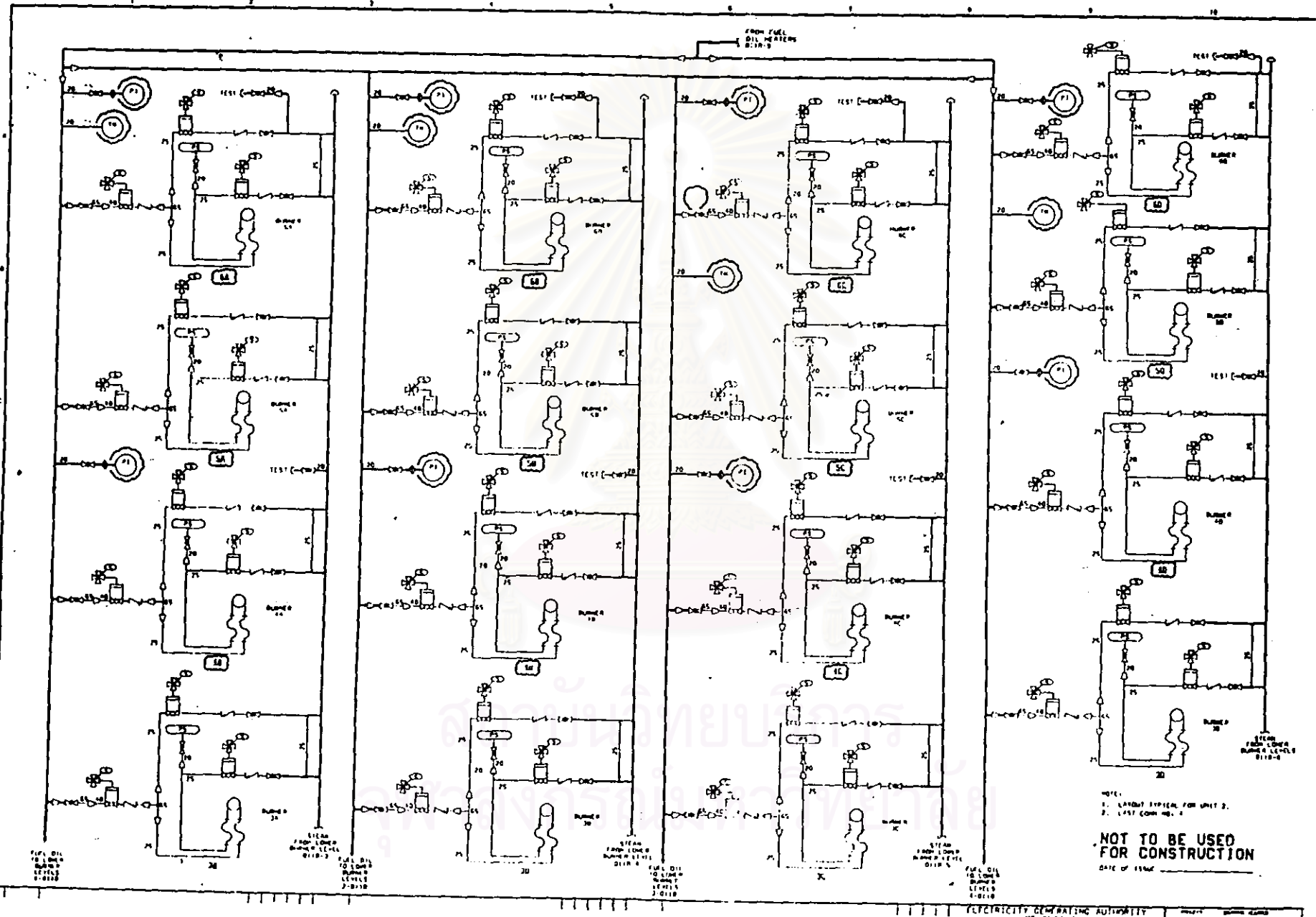


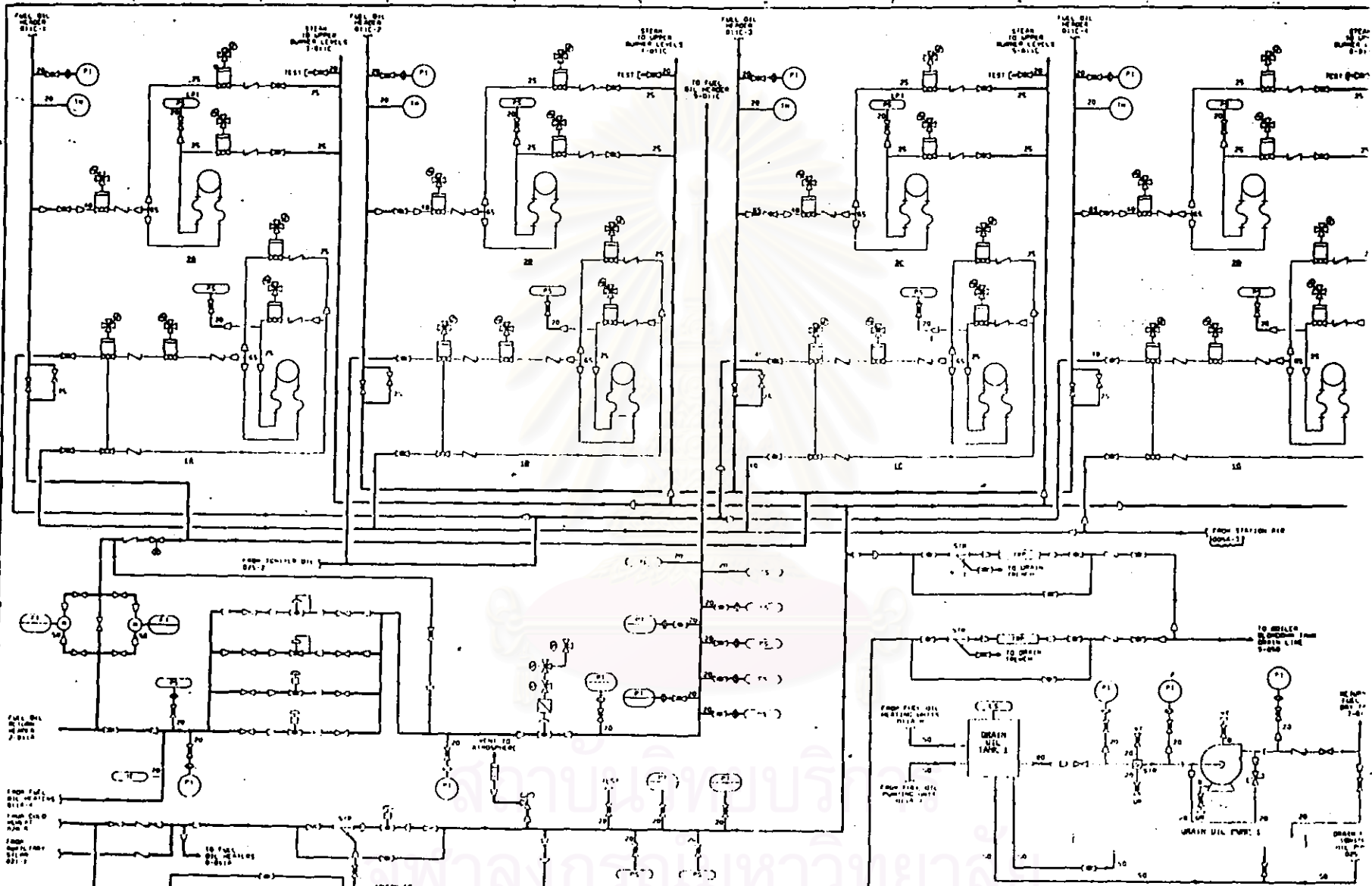


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DATE OF ISSUE
PROJECT NO. 11 PA-LM2012A





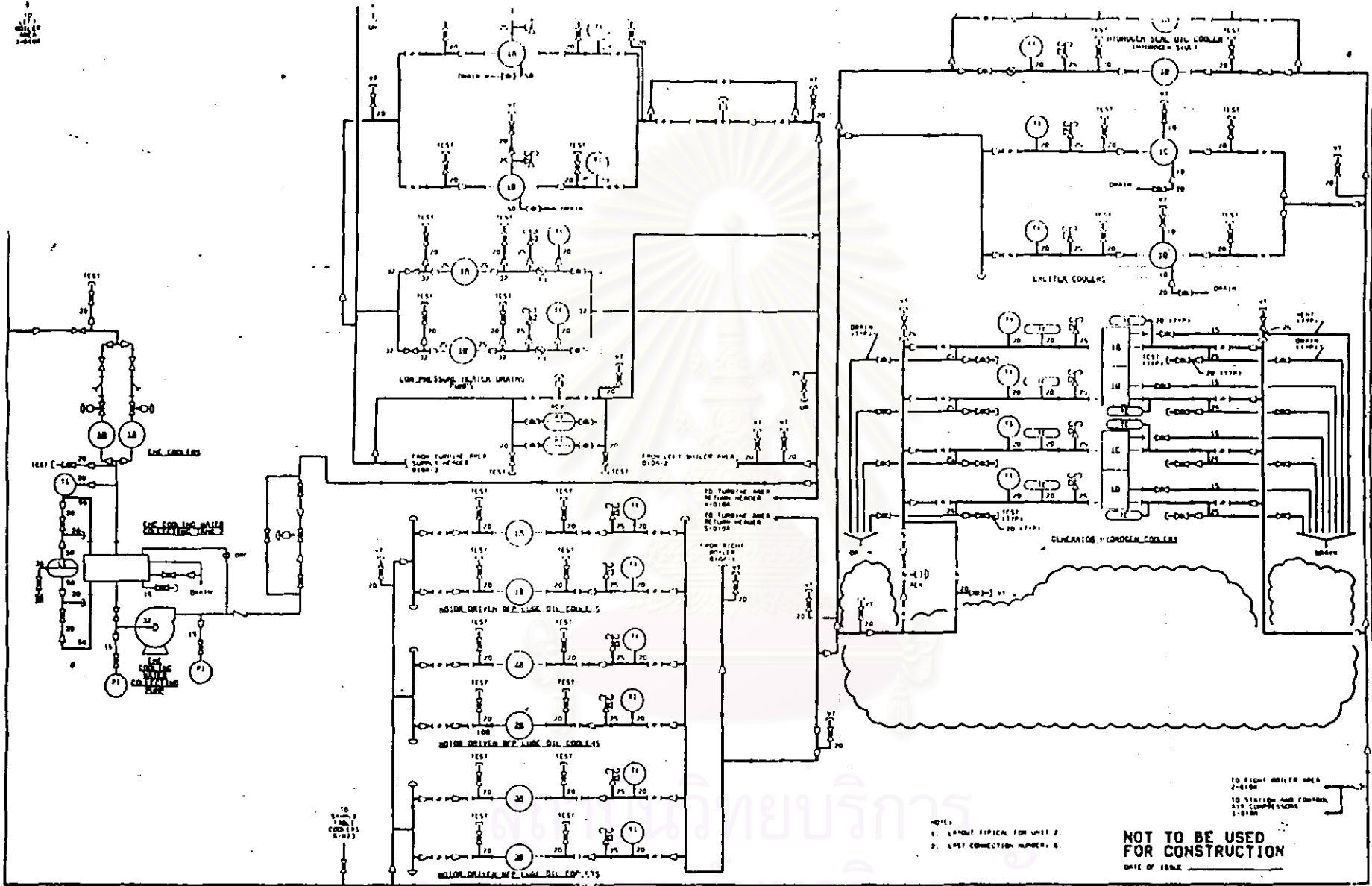
NOTE:
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DATE OF ISSUE

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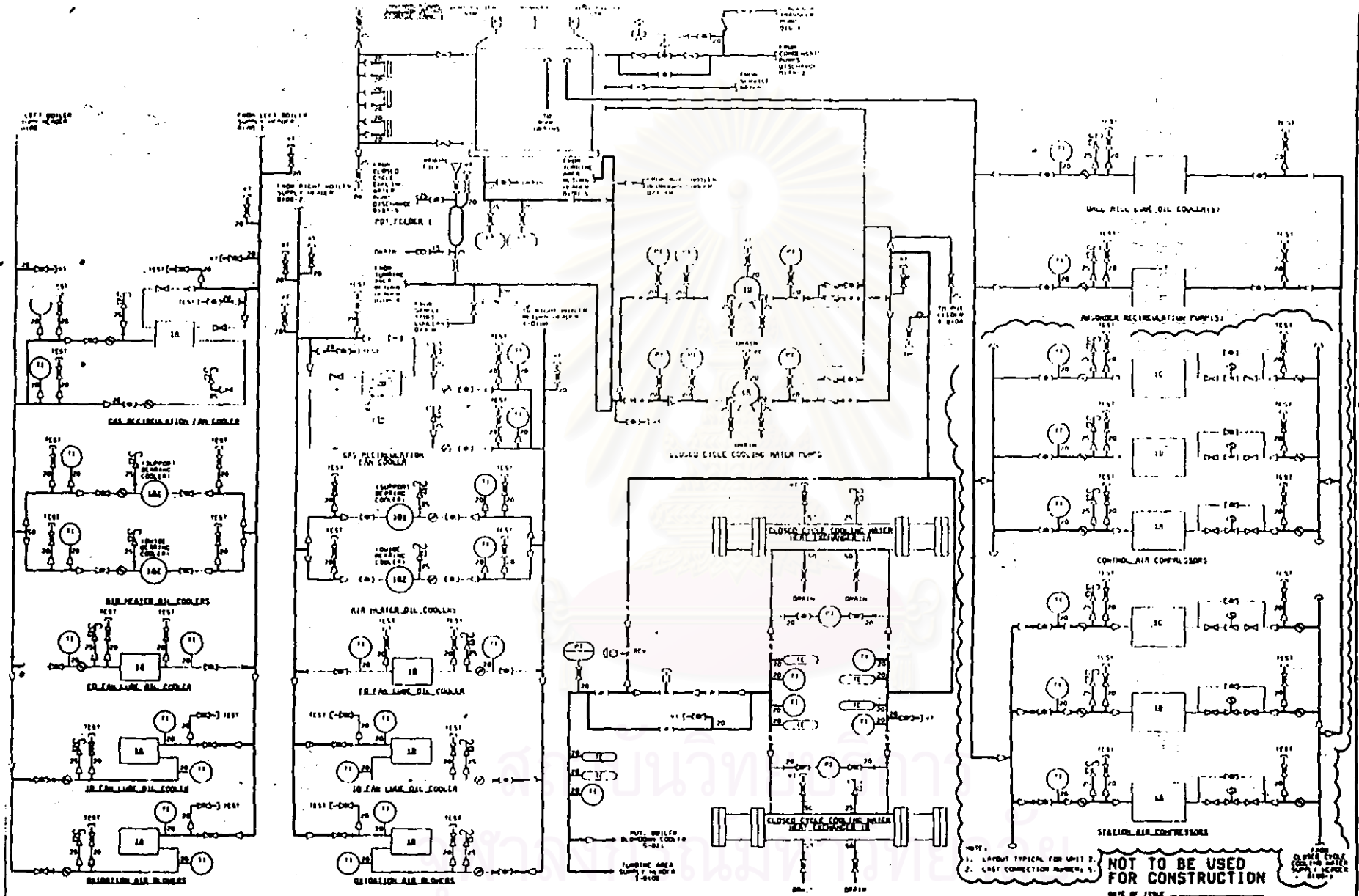
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NOTES:
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2004, THE 2004, 2004, 2004		DRAWING NO. 00049-IECB-EM20100 A	
PIPING AND INSTRUMENT DIAGRAM		DRAWN BY: []	
CLOSED CYCLE COOLING WATER - SHEET 2		CHECKED BY: []	
REVISIONS AND RECORD OF ISSUES		DATE OF ISSUE	



NOTE:
 1. LAYOUT TYPICAL FOR UNIT 2.
 2. LAST CONNECTION NUMBER: 5.

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DATE OF ISSUE

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PIPING AND INSTRUMENT DIAGRAM CLOSED CYCLE COOLING WATER - SHEET 1	DRAWN BY: [Signature] CHECKED BY: [Signature]

Biography



Mr. Arin Pavidabha

Mr. Arin Pavidabha got Bachelor Degree of Electrical Engineering from King Mongkut Institute of Technology Thonburi Campus in 1988. After graduated, he has joined to work with the Electricity Generating Authority of Thailand (EGAT) as a Control and Instrumentation Engineer since 1989. In 1997, he started his Graduate study at the Regional Centre for Manufacturing Systems Engineering of Chulalongkorn University in the Engineering Business Management joined program between Chulalongkorn University and Warwick Manufacturing Groups of the University of Warwick. Right now, he is the Field Instrumentation Section Manager of the Power Plant Control System Engineering Department of the Electrical and Control System Engineering Division, which is under the Engineering Business Unit of EGAT.

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