THE ISLAMIC REPUBLIC OF PAKISTAN

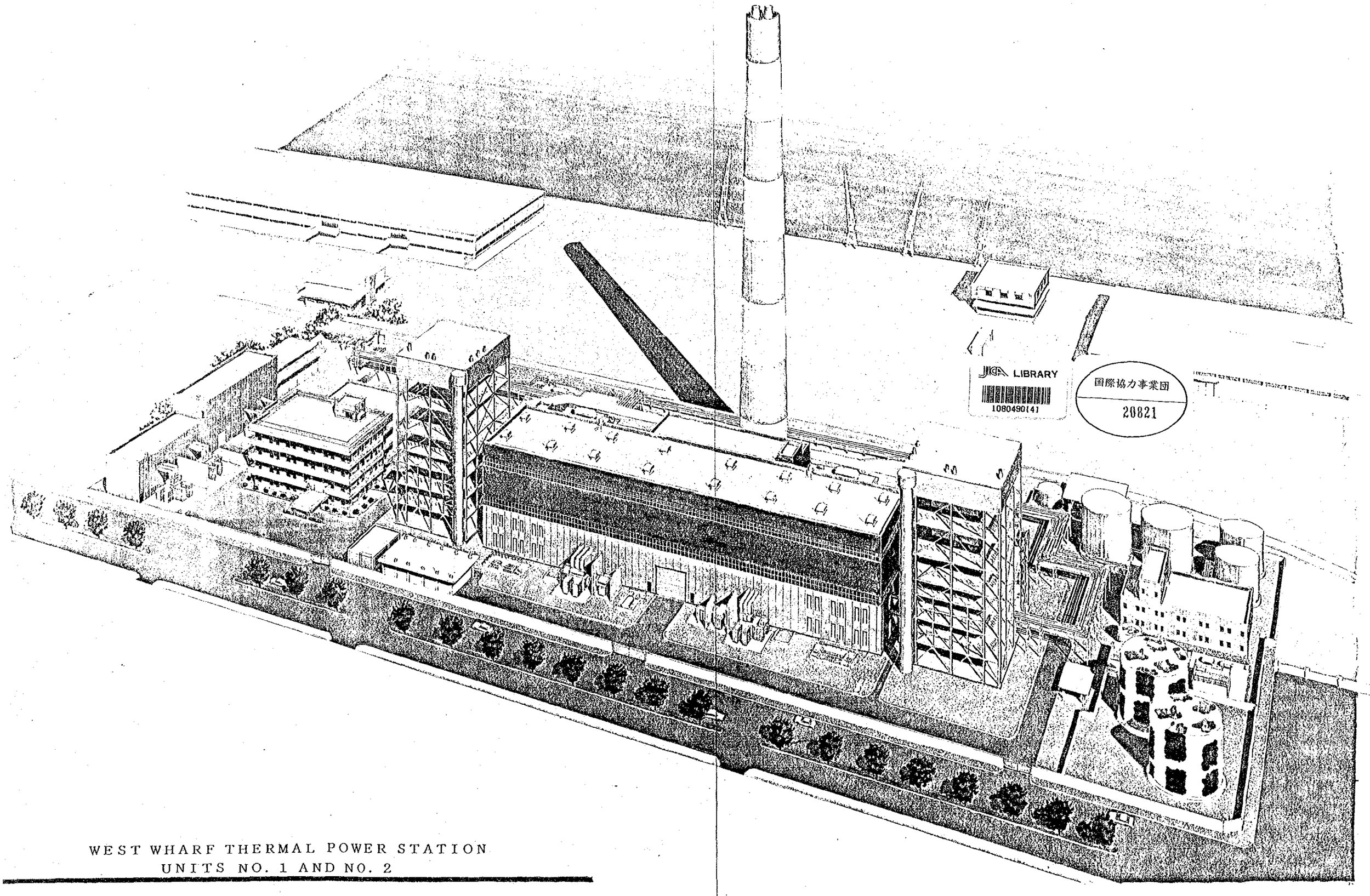
DETAILED DESIGN STUDY
ON
WEST WHARF
THERMAL POWER PLANT PROJECT

FINAL REPORT-II

LOT I (VOLUME 6)

JANUARY 1990

JAPAN INTERNATIONAL COOPERATION AGENCY



WEST WHARF THERMAL POWER STATION
UNITS NO. 1 AND NO. 2

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NOTE

THE DRAWINGS WITH THE * MARK ARE PREPARED FOR UNIT 1 ONLY AND SHALL BE APPLIED FOR BOTH UNIT 1 AND UNIT 2.

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MECHANICAL

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	INSTRUMENT FOR REMOTE RECORDER & INDICATOR
	INSTRUMENT FOR COMPUTER
	INSTRUMENT FOR COMPUTER & REMOTE INDICATOR
	FLOATING SUCTION

ELECRICAL

SYMBOLS	LEGEND
OR	REMOTE OPERATED DISCONNECTING SWITCH
OR	MANUAL OPERATED DISCONNECTING SWITCH OR KNIFE SWITCH
OR	CIRCUIT BREAKER (OIL CIRCUIT BREAKER OR GAS CIRCUIT BREAKER, MAGNETIC BLOW-OUT CIRCUIT BREAKER)
OR	TRANSFORMER
	LIGHTNING ARRESTER
	BLOCKING COIL OR CURRENT LIMITTING REACTOR
	POTENTIAL DEVICE
	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
	DIRECTED GROND
GEN	GENERATOR
IM	INDUCTION MOTOR
	CABLE HEAD
	BATTERY
	METER OR TRANSDUCER
	RELAY
« »	DISCONNECTING DEVICE
	AIR CIRCUIT BREAKER OR MOLDED TYPE AIR CIRCUIT BREAKER
	THERMAL RELA
	CAPACITOR
	FUSE
	SYNCHRONIZING SWITCH
	AMMETER SWITCH
	VOLTMETER SWITCH
	TESTING TERMINAL
	A CONTACT
	B CONTACT
DM	DC MOTOR
	RECTIFIER
	SILICON CONTROLLED RECTIFIER

TRANSMISSION, SUBSTATION & LOAD DISPATCHING

SYMBOLS	LEGEND
	DISCONNECTING SWITCH (REMOTE OPERATION)
	DISCONNECTING SWITCH (MANUAL OPERATION)
	CIRCUIT BREAKER
	TRANSFORMER
	LIGHTNING ARRESTER
	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
	POWER FUSE
	AMMETER SWITCH
	VOLTMETER SWITCH
OCG	OVER CURRENT GROUND RELAY
DZG	GROUND DISTANCE RELAY
VB	VOLTAGE BALANCE RELAY
DZ	DISTANCE RELAY
P	DIRECTIONAL POWER RELAY
OC	OVER CURRENT RELAY
SS	SYNCHRONIZING SWITCH
	AUTOMATIC OSCILLOGRAPH ELEMENT
Tm	TELEMETER CONVERTER
WH	WATT HOUR METER
VAR	VAR METER
W	WATT METER
A	AMMETER
RVW	RECORDING VOLT WATT METER
MAG	GROUNDING MAXIMUM AMMETER
	MULTI CONTACT RELAY
	POTENTIAL DEVICE
	LINE TRAP

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

SYMBOL MARKS LIST AND DEVICE FUNCTION NUMBERS-1

JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO JAPAN

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
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DRAWING NO.		SCALE	DATE
WGT-1001		NONE	10TH JAN 1990

TRANSMISSION, SUBSTATION & LOAD DISPATCHING

SYMBOLS	LEGEND
(F)	FREQUENCY METER
(MVo)	ZERO PHASE VOLTAGE METER
⊕	RECLOSING RELAY
UV OR (↓)	UNDERVOLTAGE RELAY
UVG	UNDERVOLTAGE GROUND RELAY
HOC	HIGH SPEED OVERCURRENT RELAY
RDf	DIFFERENTIAL RELAY
27SA	UNDERVOLTAGE RELAY FOR DETECTION OF SHORT CIRCUIT IN BUS A
27GA	UNDERVOLTAGE RELAY FOR DETECTION OF GROUND FAULT IN BUS A
87DA	CURRENT DIFFERENTIAL RELAY FOR BUS A
87BA	HIGH IMPEDANCE TYPE DIFFERENTIAL RELAY FOR BUS A

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

SYMBOL MARKS LIST AND DEVICE FUNCTION NUMBERS-2

JAPAN INTERNATIONAL COOPERATION AGENCY

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NUMBER	FUNCTION
1	MASTER CONTROLLER OR SWITCH
2	TIME-DELAY STARTING OR CLOSING RELAY
3	CONTROL SWITCH
4	DEVICE OR RELAY FOR CONTROLLING A MAIN CONTROL CIRCUIT
5	STOPPING SWITCH OR RELAY
6	STARTING CIRCUIT BREAKER, SWITCH, CONTACTOR, OR RELAY
7	ADJUSTING SWITCH
8	CONTROL POWER SWITCH
9	FIELD REVERSING SWITCH, CONTACTOR, OR RELAY
10	SEQUENCE SWITCH OR PROGRAM CONTROLLER
11	TESTING SWITCH OR RELAY
12	OVERSPEED SWITCH OR RELAY
13	SYNCHRONOUS SPEED SWITCH OR RELAY
14	UNDERSPEED SWITCH OR RELAY
15	SPEED REGULATING DEVICE
16	PILOT WIRE SUPERVISORY RELAY
17	PILOT WIRE RELAY
18	ACCCELERATING OR DECELERATING CONTACTOR OR RELAY
19	STARTING-TO-RUNNING TRANSITION CONTACTOR OR RELAY
20	VALVE FOR AUXILIARY MACHINE
21	VALVE FOR MAIN MACHINE
22	EARTH LEAKAGE CIRCUIT BREAKER, CONTACTOR, OR RELAY
23	TEMPERATURE CONTROL DEVICE OR RELAY
24	TAP CHANGING DEVICE
25	SYNCHRONIZING OR SYNCHRONISM-CHECK DEVICE
26	TEMPERATURE SWITCH OR RELAY FOR STATIC EQUIPMENT
27	A. C. UNDERVOLTAGE RELAY
28	ALARM DEVICE
29	FIRE EXTINGUISHING DEVICE
30	INDICATING DEVICE FOR FAULT OR OPERATING CONDITION
31	FIELD CHANGING CIRCUIT BREAKER, SWITCH, CONTACTOR, OR RELAY
32	D. C. REVERSE-CURRENT RELAY
33	POSITION SWITCH OR POSITION DETECTING DEVICE
34	MOTOR OPERATED SEQUENCE CONTROLLER
35	BRUSH-OPERATING OR SLIP-RING SHORT-CIRCUITING DEVICE
36	POLARITY RELAY
37	UNDERCURRENT RELAY
38	BEARING TEMPERATURE SWITCH OR RELAY
39	SUPERVISORY DEVICE OR DETECTING SWITCH FOR MECHANICAL ABNORMALITY
40	FIELD CURRENT RELAY OR LOSS-OF-FIELD RELAY
41	FIELD CIRCUIT BREAKER, SWITCH, OR CONTACTOR
42	RUNNING CIRCUIT BREAKER, SWITCH, OR CONTACTOR
43	CONTROL CIRCUIT SELECTOR SWITCH, CONTACTOR, OR RELAY
44	DISTANCE RELAY
45	D. C. OVERVOLTAGE RELAY
46	NEGATIVE-PHASE-SEQUENCE OR PHASE-UNBALANCE CURRENT RELAY
47	OPEN PHASE RELAY OR NEGATIVE-PHASE-SEQUENCE VOLTAGE RELAY
48	INCOMPLETE SEQUENCE RELAY
49	TEMPERATURE SWITCH, RELAY, OR OVERLOAD RELAY FOR ROTATING MACHINE
50	SELECTIVE SHOT-CIRCUIT RELAY OR SELECTIVE GROUND RELAY
51	A. C. OVERCURRENT RELAY OR OVERCURRENT GROUND RELAY
52	A. C. CIRCUIT BREAKER OR CONTACTOR
53	EXCITATION RELAY OR IGNITION RELAY
54	HIGH-SPEED CIRCUIT BREAKER
55	AUTOMATIC POWER-FACTOR REGULATOR OR POWER-FACTOR RELAY
56	SLIP DETECTIVE DEVICE OR OUT-OF-STEP RELAY
57	AUTOMATIC CURRENT REGULATING DEVICE OR CURRENT RELAY
58	(RESERVED FOR FUTURE APPLICATION.)
59	A. C. OVERVOLTAGE RELAY
60	AUTOMATIC VOLAGE BALANCE REGULATING DEVICE OR VOLTAGE BALANCE RELAY
61	AUTOMATIC CURRENT BALANCE REGULATING DEVICE OR CURRENT BALANCE RELAY
62	TIME-DELAY STOPPING OR OPENING RELAY
63	PRESSURE SWITCH OR RELAY
64	OVERVOLTAGE GROUND RELAY
65	GOVERNOR
66	FLASHER RELAY
67	A.C. DIRECTIONAL POWER RELAY OR DIRECTIONAL GROUND RELAY
68	IMPURITY DETECTIVE DEVICE
69	FLOW SWITCH OR RELAY
70	RHEOSTAT
71	DETECTOR FOR RECTIFIER ELEMENT FAILURE
72	D. C. CIRCUIT BREAKER OR CONTACTOR
73	SHORT-CIRCUIT BREAKER OR CONTACTOR
74	REGULATING VALVE
75	BRAKING DEVICE
76	D. C. OVERCURRENT RELAY
77	LOAD REGULATING DEVICE
78	PHASE COMPARISON RELAY FOR CARRIER SYSTEM
79	A. C. RECLOSING RELAY
80	D. C. UNDERVOLTAGE RELAY
81	GOVERNOR DRIVING DEVICE
82	D.C. RECLOSING RELAY
83	SELECTOR SWITCH, CONTACTOR OR RELAY
84	VOLTAGE RELAY
85	SIGNAL RELAY
86	LOCK-OUT RELAY
87	DIFFERENTIAL RELAY
88	CONTACTOR, SWITCH, CIRCUIT BREAKER OR RELAY FOR AUXILIARY EQUIPMENT
89	DISCONNECTING SWITCH OR LOAD BREAK SWITCH
90	AUTOMATIC VOLTAGE REGULATOR OR AUTOMATIC VOLTAGE REGULATING RELAY
91	AUTOMATIC POWER REGULATOR OR POWER RELAY
92	DOOR OR DAMPER
93	(RESERVED FOR FUTURE APPLICATION)
94	TRIP-FREE CONTACTOR OR RELAY
95	AUTOMATIC FREQUENCY REGULATOR OR FREQUENCY RELAY
96	INTERNAL FAULT DETECTIVE DEVICE FOR STATIC APPARATUS
97	RUNNER
98	COUPLING DEVICE
99	AUTOMATIC RECORDING DEVICE

Note : Reserved number "58" and "93" shall not be used, as a rule.

REFERENCE

AUTOMATIC CONTROLLING NUMBER JEM-1090 1978

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

SYMBOL MARKS LIST AND DEVICE FUNCTION NUMBERS-3

JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO JAPAN

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
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ABBREVIATION	WORD
	— A —
A	AREA, AMBER, AMMETER
AB	AIR BLAST, AUXILIARY BUS, ANCHOR BOLT, ACOUSTICAL BOARD
ABB	AIR BLAST CIRCUIT BREAKER
ABC	AUTOMATIC BOILER CONTROL
ABS	ABSOLUTE, AUTOMATIC BURNER CONTROL SYSTEM
ABV	ABOVE
AC	ALTERNATING CURRENT, ASBESTOS CEMENT
ACB	AIR CIRCUIT BREAKER, ASBESTOS CEMENT BOARD
ACSR	ALUMINUM CABLE STEEL
ACST	ACOUSTIC
AD	ACCESS DOOR, ADVERTISING
A/D	ANALOG-TO-DIGITAL
ADJ	ADJUST, ADJUSTABLE
ADMSN	ADMISSION
AE	AIR EXTRACTION
AF	AIR FOAM
AFC	AUTOMATIC FREQUENCY CONTROL
AG	AGITATOR
AH	AIR PREHEATER, AMPERE HOUR
AHM	AMPERE HOUR METER
AL	ALUMINUM
ALT	ALTERNATOR
ALUM	ALUMINUM
AM	AMMETER
AMB	AMBIENT
AMP	AMPERE, AMPLIFIER
ANN	ANNUNCIATOR
AP	ACID PROOF, ASPHALT PAVEMENT, ALUMINUM PANEL
APP	ACID PROOF PAINT
APPD	APPROVED
APPL	APPLICATION
APPROX	APPROXIMATE, APPROXIMATELY
APR	APRIL
APVB	ACID PROOF VINYL BASE
APVT	ACID PROOF VINYL TILE
AQR	AUTOMATIC QUADRATURE CONTROL
ARCH	ARCHITECTURAL
ARM	ARMATURE
ARR	ARRANGEMENT
ART	ARTICLE
AS	AMMETER SWITCH, AUXILIARY STEAM
ASB	ASBESTOS
ASSY	ASSEMBLY
ATC	ACOUSTICAL TILE CEILING
ATM	ATOMOSPHERE, ANALOG TELE METER
ATMIZ	ATOMIZER
AUG	AUGUST
AUTO	AUTOMATIC
AUX	AUXILIARY
AVC	AUTOMATIC VOLTAGE CONTROL
AVG	AVERAGE
AVR	AUTOMATIC VOLTAGE REGULATOR
AW	ALUMOWELD STEEL STRANDED WIRE, ACCESS WAY, ASPHALT WATER PROOF

ABBREVIATION	WORD
	— B —
B	BOX, BLACK
B/	BOTTOM OF
B/M	BILL OF MATERIAL
BA	BASEBOARD
BAF	BAFFLE
BAL	BALANCE
BAT	BATTERY (ELECTRICAL)
BC	BLOCKING COIL, PRE-BID CONFERENCE
BCP	BOILER CIRCULATING PUMP
BCT	BUSHING CURRENT TRANSFORMER
BCW	BEARING COOLING WATER
BD	BOARD, BOILER DRAIN, BLOW DOWN, BIDDING DOCUMENT
BEF	BEFORE
BET	BETWEEN
BF	BOILER FEED
BFP	BOILER FEED PUMP
BHT	BOILER HYDROSTATIC TEST
BKR	BREAKER
BL	BASE LINE, BLUE
BLDG	BUILDING
BLK	BLOCK
BLO	BLOWER
BLR	BOILER
BLT	BOLT
BM	BEAM, BENCH MARK
BO	BID OPENING
BOD	BIOCHEMICAL OXYGEN DEMAND
BNR	BURNER
BOP	BOTTOM OF PIPE
BOT	BOTTLE, BOTTOM
BP	BASE PLATE
BR	BRANCH, BEND RADIUS
BRDG	BRIDGE
BRG	BEARING
BRK	BRICK
BRKR	BREAKER
BRKT	BRACKET
BS	BLEED STEAM
BSMT	BASEMENT
BT	BUS TIE
BTG	BOILER TURBINE GENERATOR
B-U	BACK-UP
BUSH	BUSHING
BV	BALANCED VOLTAGE
BYP	BY-PASS
BZ	BUZZER
	— C —
C	CATHODE, CENTIGRADE, CLEAR, CABLE, CONDUCTOR
CA	CONTROL AIR
CAB	CABINET
CAL	CALORIE
CALC	CALCULATE
CAP	CAPACITY, CAPACITOR
CARR	CARRIER
CAT	CATALOGUE
CATHC	CATHODIC
CB	CIRCUIT BREAKER, CEMENT BASE, CONCRETE BLOCK, CONTINUOUS BLOWDOWN

ABBREVIATION	WORD
CC	CLOSING COIL, COMBUSTION CONTROL, COUPLING CAPACITY, CINDER CONCRETE
C/C	CONTROL CENTER
CCM	CORRUGATED COLORED METAL
CCR	CENTRAL CONTROL ROOM
CCT	CIRCUIT
CCW	COUNTER CLOCKWISE
CD	CONTROL DRIVE (DAMPER)
CDP	CYCLIC DIGITAL-INFORMATION PROCESSOR
CDT	CYCLIC DIGITAL TRANSMITTER
CEM	CEMENT
CER	CERAMIC
CF	CHEMICAL FEED, COOLING FAN
CH	CHAIN, CABLE HEAD
CHAMB	CHAMBER
CHAN	CHANNEL
CHARG	CHARGER
CHD	CABLE HEAD
CHEM	CHEMICAL
CHK	CHECK
CHLTN	CHLORINATION
CH PL	CHECKERED PLATE
CI	CAST IRON
CIRC	CIRCULATE, CIRCULATING
CJ	CONTROL JOINT
CL	CLOSE, CHLORINE, CENTER LINE
℄	CENTER LINE
CLASS	CLASSIFICATION
CLEAR	CLEARANCE
CLF	CURRENT LIMITING FUSE
CLNG	CLEANING
CLO	CLOSET
CLOS	CLOSURE
CLR	CLEAR, COOLER, COLOR
CLRNTN	CHLORINATION
CM	CENTIMETER
CMT	CERAMIC MOSAIC TILE
CMPTR	COMPUTER
CNDS	CONDENSATE
CNDTNG	CONDITIONING
CNDTNR	CONDITIONER
CNTR	CENTER
CO	COMPANY
C.O	CHAIN OPERATED (VALVE)
CO_2	CARBON DIOXIDE
COD	CHEMICAL OXYGEN DEMAND
COL	COLUMN, COLOR
COLL	COLLECTOR
COM	COMMON
COMB	COMBINATION, COMBUSTION
COML	COMMERCIAL
COMM	COMMUNICATION, COMMON
COMP	COMPRESSION
COMPL	COMPLETE, COMPLETION
CONC	CONCRETE
CONC-B	CONCRETE BLOCK
CONC-P	CONCRETE PAVEMENT
COND	CONDENSER
CONN	CONNECTION
CONST	CONSTANT, CONSTRUCTION
CONT	CONTINUOUS, CONTRACT
CONTR	CONTRACTOR

ABBREVIATION	WORD
COOL	COOLING
CORP	CORPORATION
CORR	CORRECT, CORROSION, CORRUGATED
COV	COVER
CP	CONDENSATE PUMP, CATHODIC PROTECTION, CEMENT PLASTER, CARD PUNCH
CPL	CEMENT PLASTER
CPLG	COUPLING
CPM	CRITICAL PATH METHOD
CPRSR	COMPRESSOR
CPS	CYCLES PER SECOND
CPU	CENTRAL PROCESSING UNIT
CR	CARD READER
CRES	CORROSION-RESISTANT STEEL
CRT	CATHODE RAY TUBE
CRV	COMBINED REHEAT STOP VALVE
CS	CONTROL SWITCH, CAST STEEL, CONTRACT SIGNING
CSS	COMMON STATION SERVICE
CT	CURRENT TRANSFORMER, CERAMIC TILE
CTR	CENTER
CTW	CONSOLE TYPEWRITER
CTWT	COUNTER WEIGHT
CU	CUBIC, COPPER
CUB	CUBICLE
CUR	CURRENT
CV	CROSSLINKED POLYETHYLENE PVC INSULATED, CHECK VALVE, CONTROL VALVE
CVCF	CONSTANT VOLTAGE & CONSTANT FREQUENCY
CW	CLOCKWISE, CIRCULATING WATER
CWP	CIRCULATING WATER PUMP
CY	CYCLE
CYL	CYLINDER
	— D —
D	DRAIN, DEPTH
D/A	DIGITAL-TO-ANALOG
DBL	DOUBLE
DC	DIRECT CURRENT, DOOR CLOSER
DD	DOOR DIMENSION
DEAER	DEAERATOR
DEC	DECEMBER
DEG	DEGREE, DIESEL ENGINE GENERATOR
DEMI	DEMINERALIZER
DEPT	DEPARTMENT
DESALIN	DESALINATION
DESCR	DESCRIBE

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

ABBREVIATION LIST — 1

JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO JAPAN

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ABBREVIATION	WORD
DET	DETAIL, DETECTOR
DIA	DIAMETER
DIAG	DIAGRAM
DIAPH	DIAPHRAGM
DIFF	DIFFERENTIAL
DIM	DIMENSION
DIR	DIRECTION
DISC	DISCONNECT
DISCH	DISCHARGE
DISP	DISPATCHING
DIST	DISTANCE
DISTN	DISTRIBUTION
DISTR	DISTRIBUTOR
DIV	DIVISION
DL	DEAD LOAD, DRAWING LIST, DRUM LIFTING
DM	DIRECT CURRENT MOTOR
DN	DOWN
DO	DITTO
DOL	DOLPHIN
DOT	DOTTED
DOZ	DOZEN
DP	DOUBLE POLE, DECK PLATE
D/P	DISTRIBUTION PANEL
DPC	DISPATCHING POWER CONTROL
DPDT	DOUBLE-POLE DOUBLE-THROW
DPI	DIFFERENTIAL PRESSURE INDICATOR, DISPATCHING POWER INDICATE
DPST	DOUBLE POLE SINGLE THROW
DR	DOOR
DRG	DRAINAGE
DS	DISCONNECTING SWITCH, DRAFT SWITCH
DSGN	DESIGN
DSGNG	DESIGNING
DSUPHTR	DESUPERHEATER
DT	DRAFT TEST TAP, DISCHARGE TUNNEL
DUP	DUPLICATE
DW	DISTILIATE WATER
DWG	DRAWING
DWTR	DRINKING WATER

— E —

EA	EACH
ECON	ECONOMIZER
EDC	ECONOMIC-LOAD DISPATCHING CONTROL
EF	EACH FACE
EFF	EFFICIENCY
EHC	ELECTRO HYDRAULIC CONTROL
EJECT	EJECTOR
EL	ELEVATION
ELD	ECONOMIC LOAD DISPATCHING
ELEC	ELECTRIC, ELECTRICAL
ELEM	ELEMENT, ELEMENTARY
ELEV	ELEVATOR, ELEVATION
EMER	EMERGENCY
ENG	ENGINE
ENGR	ENGINEER
E/P	ELECTRICAL/PNEUMATIC
EP	ELECTRIC PRECIPITATOR
EQ	EQUAL, EQUATION
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
ER	ERECTION
ESC	ESCUTCHEON
EST	ESTIMATE
ETC	ET CETERA
EVAP	EVAPORATOR
EVAL	EVALUATION, EVALUATE
EX	EXAMPLE, EXCITER
EXC	EXCITER, EXCITATION (CUBICLE), EXCAVATION
EXCH	EXCHANGE
EXH	EXHAUST
EXST	EXISTING
EXP	EXPANSION
EXT	EXTENTION, EXTRA, EXTERNAL, EXTERIOR
EXTN	EXTRACTION

— F —

F	FREQUENCY METER, FORCE, FIRE
FAX	FACSIMILE EQUIPMENT
FB	FLAT BAR, FLEXIBLE BOARD
FC	FEED WATER CONTROL
FCB	FIELD CIRCUIT BREAKER, FAST CUT BACK
FD	FORCED DRAFT, FLOOR DRAIN
FDF	FORCED DRAFT FAN
FDR	FEEDER
FEB	FEBRUARY
FF	FACTORY FINISH
FG	FLOW-SIGHT GLASS, FUNCTION GENERATOR
FI	FLOW INDICATOR
FIG	FIGURE
FIN	FINISH
FL	FLASHING, FLOOR, FLOOR LEVEL, FLUORESCENT LAMP
FLG	FLANGE
FLD	FIELD
FLEX	FLEXIBLE
FLT	FLOAT, FILTER
FLUOR	FLUORECENT
FM	FREQUENCY METER, FREQUENCY MODULATION
FND	FOUNDATION
FO	FUEL OIL, FIRM ORDER
FOB	FREE ON BOARD
FP	FIRE PROTECTION
FR	FLOW RECORDER, FRONT, FRAME
FREQ	FREQUENCY
FRN	FURNACE
FS	FLOW SWITCH, FREQUENCY SHIFT
FT	FOOT
FU	FUSE
FUNL	FUNNEL
FURN	FURNISH
FUT	FUTURE
FW	FEEDWATER, FRESH WATER
FWD	FORWARD
FWP	FEEDWATER PIPE

— G —

G	GAS, GRAM, GRAVITY, GREEN, GENERATOR, GAVAGE
GA	GAUGE
GAH	GAS AIR HEATER
GALV	GALVANIZE
GCB	GAS CIRCUIT BREAKER
GD	GROUND DETECTOR, GUARD
GDR	GUARD RAIL, GUTTER DRAIN
GEN	GENERATOR, GENERAL
GF	GENERATOR FIELD, GENERAL FLOWCHART
GIF	GAS INJECTION FAN
GL	GROUND LEVEL, GLASS, GLAZE
GMF	GAS MIXING FAN
GOV	GOVERNOR
GR	GRADE
GRD	GROUND, GROUNDING
GRF	GAS RECIRCULATION FAN
GRN	GREEN
GRTG	GRATING
GS	GLAND STEAM
GSC	GLAND STEAM CONDENSER
GSR	GLAND STEAM REGULATOR
GST	GUN SPRAYED TILE
GT	GENERATOR AND TRANSFORMER
GV	GROUND VOLT-METER
GWT	GLAZED WALL TILE

— H —

H	HIGH, HATCH, HENRY, HARD, HEIGHT
H_2	HYDROGEN
HN_3	AMMONIUM
H_2N_4	HYDRAZINE
HAL	HARD ALUMINIUM STRANDED WIRE
HD	HEAD, HANDSET DESK-TYPE
HDCC	HARD DRAWN COPPER CONDUCTOR
HDL	HANDLE
HDR	HEADER, HAND RAIL
HEX	HEXAGON
Hg	MERCURY
HGR	HANGER
HGT	HEIGHT
HH	HANDHOLE
HHV	HIGHER HEATING VALUE
HHWL	HIGHEST HIGH WATER LEVEL
HI	HIGH
HIV	HEAT-RESISTANT POLYVINYL CHLORIDE INSULATED WIRE
HO	HOIST
HOR or H	HORIZONTAL
HP	HIGH PRESSURE, HORSE POWER
HPT	HIGH POINT
HR	HOUR, HAND RESET
HS	HIGH SPEED
HSD	HIGH SPEED DIESEL
HSG	HOUSING
HT	HEAT, HEIGHT, HYDROSTATIC TEST
HTBV	HIGH-PRESSURE TURBINE BYPASS VALVE
HTL	HOTWELL
HTR	HEATER, HOUSE TRANSFORMER
HV	HIGH VOLTAGE
HVY	HEAVY
HW	HOT WATER, HANDSET WALL-TYPE
HWL	HIGH WATER LEVEL, HOTWELL
HYDR	HYDRAULIC
HYDRO	HYDROSTATIC
Hz	HERTZ

— I —

I	INDICATOR
IC	INTERRUTING CAPACITY, INTEGRATED CIRCUIT
ID	INSIDE DIAMETER
IDF	INDUCED DRAFT FAN, INTERMEDIATE DISTRIBUTING FRAME
IDR	INDOOR
IF	INITIAL FIRING
IGN	IGNITION
IL	INITIAL LOADING
ILLUM	ILLUMINATE
IM	INDUCTION MOTOR
INCR	INCREASE
IND	INDICATE, INDICATOR, INDUSTRIAL
INFO	INFORMATION
INJ	INJECTION
INL	INLET
INSP	INSPECTION
INST.A	INSTRUMENT AIR
INSTR	INSTRUMENT
INSUL	INSULATION, INSULATE
INT	INTEGRAL, INTERNAL, INTAKE
INTER	INTERMEDIATE
INTLK	INTERLOCK
IO	IGNITION OIL
I/O	INPUT OUTPUT
IOC	INTAKE OPEN CHANNEL
IOP	IGNITION OIL PUMP
IPB	ISOLATED PHASE BUS DUCT
ISO	INTERNATIONAL ORGANIZATION FOR STANDARDIZATION
IT	INSULATING TRANSFORMER, INTAKE TUNNEL, ISSUANCE OF TENDER
ITR	INTERCHANGE TRANSFORMER

— J —

JAN	JANUARY, JANITORIAL
JB	JUNCTION BOX
JC	JANITORS CLOSET
JT	JOINT
JUL	JULY
JUN	JUNE

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

ABBEVIATION LIST — 2

JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO JAPAN

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa		M. Kamihara	
DRAWING NO.		SCALE	DATE
WGT-1002		NONE	10TH JAN 1990

ABBREVIATION	WORD
	— K —
K	KILO
KB	KEY BOARD
KG	KILOGRAM
KM	KILOMETER
KV	KILOVOLT
KVA	KILOVOLT-AMPERE
KVAH	KILOVOLT-AMPERE HOUR
KVAR	KILOVAR
KW	KILOWATT
KWH	KILOWATT-HOUR
	— L —
L	LAMP, LEFT, LITER, LOW, LOCAL, LEVEL, LINEN
LA	LIGHTNING ARRESTER
LAB	LABORATORY
LAD	LADDER
LAV	LAVATORY
LC	LEVEL CONTROLLER
L/C	LETTER OF CREDIT
LCP	LINE CONTROL PANEL
LDC	LOAD DISPATCHING CENTER
LDF	LOAD DISPATCHING FACILITY
LDO	LOAD DISPATCHING OFFICE
LDT	LOAD DISPATCHING TRAINING
LF	LAND FILLING, LINE FEED
LEV	LEVEL
LG	LENGTH
LH	LEFT HAND
LI	LEVEL INDICATOR
L/I	LETTER OF INTENT
LIM	LIMIT
LIN	LINEAR
L/Q	LIQUID
LL	LIVE LOAD, LOW LEVEL
LLWL	LOWEST LOW WATER LEVEL
LO	LUBRICATING OIL
LOC	LOCATION
LOG	LOADING
LP	LOW PRESSURE, LIGHTING PANEL, LINE PRINTER
LRP	LINE RELAY PANEL
LS	LIMIT SWITCH, LEVEL SWITCH, LINE SWITCH, LAND SCAPING
LSI	LARGE SCALE INTEGRATION
LST	LOAD SWING TEST
LT	LIGHT, LINE TRAP, LOW TENSION, LONG TIME
LTBV	LOW-PRESSURE TURBINE BYPASS VALVE
LTD	LIMITED
LTG	LIGHTING
LUB	LUBRICATE
LV	LOW VOLTAGE
LWL	LOW WATER LEVEL
LWR	LOWER

ABBREVIATION	WORD
	— M —
M	METER, MOTOR, MEGA
MA	MILLIAMPERE, MAXIMUM AMMETER
MB	MAIN BUILDING
M/A	MANUAL / AUTOMATIC
MACH	MACHINE
MAG	MAGNET, MAGNETIC
MAINT	MAINTENANCE
MAR	MARCH
MATL	MATERIAL
MAX	MAXIMUM
MBB	MAGNETIC-BLOW-OUT CIRCUIT BREAKER
MC	MEGACYCLE, MOMENTARY CONTACT
M/C	METAL CLAD SWITCH GEAR
MD	MAGNETIC DISK, MAGNETIC DRUM
MDF	MAIN DISTRIBUTION FRAME
MECH	MECHANICAL, MECHANISM
MET	METAL
MEZZ	MEZZANINE
MF	METAL FURRING
MFD	MANUFACTURED
MFG	MANUFACTURING
MFR	MANUFACTURER
MFT	MASTER FUEL TRIP
MG	MOTOR GENERATOR, MILLIGRAM
MH	MANHOLE
MID	MIDDLE
MIN	MINIMUM, MINUTE
MSC	MISCELLANEOUS
MISC. D	MISCELLANEOUS DRAIN
MISC. E	MISCELLANEOUS EXHAUST
MIX	MIXTURE
MK	MARK
MKUP	MAKEUP
ML	MERCURY-ARC LAMP, MERCURY-VAPOR LAMP
MM	MILLIMETER
MN	MAIN
MO	MONTH, MOTOR OPERATED, MASONRY OPENING
MOD	MODULATOR
MOF	METERING OUTFIT
MOR P	MOORING PIER
MS	MAIN STEAM, MASTER SWITCH
MSP	MAIN STEAM PIPE
MSV	MAIN STOP VALVE
MT	MAGNETIC TAPE
MTR	MAIN TRANSFORMER
MTBF	MEAN TIME BETWEEN FAILURES
MUW	MAKE-UP WATER
mV	MILLIVOLT
MW	MEGAWATT
MWH	MEGAWATT-HOUR
MWL	MEAN WATER LEVEL
	— N —
N	NEUTRAL, NATURAL
NAT	NATURAL
NATL	NATIONAL
NC	NORMALLY CLOSE
NEG	NEGATIVE
NEGO	NEGOTIATION

ABBREVIATION	WORD
NEUT	NEUTRAL, NEUTRALIZING
NFB	NO-FUSE BREAKER
NI	NICKEL
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
No	NUMBER
NOR	NORMAL
NOV	NOVEMBER
NOZ	NOZZLE
NTS	NOT TO SCALE
NWL	NORMAL WATER LEVEL
	— O —
O	ORANGE
O2	OXYGEN
OC	OPENING COIL, OPERATING COIL, ON CENTER
OCB	OIL CIRCUIT BREAKER
OCT	OCTOBER
OD	OUTSIDE DIAMETER
ODR	OUTDOOR
OF	OIL FILLED
OFCE	OFFICE
OL	OVERLOAD, ORANGE LAMP
OP	OPEN
OPER	OPERATING
OPNG	OPENING
OPP	OPPOSITE
OPR	OPERATE
OR	OPERATION RESEARCH
ORIG	ORIGINAL
OUT	OUTLET
OVSP	OVERSPEED
	— P —
P	PAGE, PANEL, PRESSURE, PHASE, PITCH, PILASTER, PUMP
P/E	PNEUMATIC/ELECTRIC
PA	POWER AMPLIFIER
PAR	PARAGRAPH
PABX	PRIVATE AUTOMATIC BRANCH EXCHANGE
PB	PUSH BUTTON, PULL BOX, PLASTER BOARD
PC	PRE-CAST CONCRETE, PRESSURE CONTROLLER
P/C	POWER CENTER
PCP	PRECAST CONCRETE PANEL, PRIMARY CONVERTOR PANEL
PCV	POWER CONTROL VALVE
PD	POTENTIAL DEVICE
PED	PEDESTAL
PERM	PERMANENT
PF	POWER FACTOR
PG	PRESSURE GAUGE
PH	PHASE, POWER HOUSE
pH	HYDROGEN-ION CONCENTRATION
PI	PRESSURE INDICATOR, PULSE INPUT
PIP	POURED IN PLACE
P & I	PIPING AND INSTRUMENT
PI/O	PROCESS INPUT OUTPUT
PIT	POWER INTERCHANGE TRANSFORMER
PKG	PACKING, PACKAGE
PL	PLUG, PILOT LAMP
PL or P	PLATE
PLC	POWER LINE CARRIER FOR COMMUNICATION

ABBREVIATION	WORD
PLATF	PLATFORM
PLG	PILING
PLNT	PLANT
PLSTC	PLASTIC
PLYWD	PLYWOOD
PM	PHASE MODULATION
PNEU	PNEUMATIC
PNL	PANEL
PNTG	PAINTING
PORT	PORTABLE
POS	POSITION, POSITIVE
POT	POTENTIAL
PP	POWER PLANT, PIPING
PPT	POWER POTENTIAL TRANSFORMER
PR	PRESSURE RECORDER, POWER RECEIVING
PRAC	PRACTICE
PRCST	PRECAST
PRECIP	PRECIPITATOR
PRELIM	PRELIMINARY
PRESS	PRESSURE
PRFM	PERFORMANCE
PRI	PRIMARY
PROJ	PROJECT
PROT	PROTECTION
PS	PRESSURE SWITCH, POWER STATION
PS-CONC	PRESTRESSED CONCRETE
PT	PART, POINT, POTENTIAL TRANSFORMER, PRESSURE TEST TAP
PWR	POWER
PYD	PUMPYARD
	— Q —
QT	QUARRY TILE
QTY	QUANTITY
QUAL	QUALITY
QURY	QUARRY

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

ABBREVIATION LIST — 3

JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO JAPAN

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Shin-Oiwa		H. Kanehara	
DRAWING NO.		SCALE	DATE
WGT-1002		NONE	10TH JAN 1990

ABBREVIATION	WORD
	—R—
R	RED, RIGHT, RELAY, RECORDER
RAD	REDIUM
RAM	RANDOM ACCESS MEMORY
RC	RESET COIL, REINFORCED CONCRETE
RCDR	RECORDER
RCVR	RECEIVER
RD	ROOF DRAIN
RDCR	REDUCER
RE	RELIEF EXHAUST
RECIRC	RECIRCULATE, RECIRCULATING
RECP	RECEPTACLE
RECT	RECTIFIER
REF	REFER, REFERENCE
REINF	REINFORCE
RELOC	RELOCATED
REM	REMOVABLE, REMOVE
REQ	REQUEST
REQD	REQUIRED
RES	RESISTANCE, RESISTOR
RESID	RESIDUAL
RET	RETURN
REV	REVISION
RFG	ROOFING
RH	RIGHT HAND, REHEATER
RLF	RELIEF
RM	ROOM
RPM	REVOLUTION PER MINUTE
RPS	REVOLUTION PER SECOND
RR	RELAY RACK
RSFL	RAPID START FLUORESCENT LAMP
RTD	RESISTANCE TEMPERATURE DETECTOR
RTR	ROTOR
RV	REVERSE CURRENT VALVE, RELIEF VALVE, REAR VIEW
RVS	REVERSE
RW	RAW WATER
RY	RELAY
	—S—
S	SHIELD, STEEL, STARTING, SWITCH, SATURATION
SA	SERVICE AIR, SERGE ABSORBER
SAB	SEAL AIR BOOSTER BLOWER
SAF	SAFETY
SAMP	SAMPLING
SAN	SANITARY
SB	SOOT BLOWER, SYNCHRONIZING BUS
SCAH	STEAM COIL AIR PREHEATER
SCHED	SCHEDULE
SCR	SILICON CONTROLLED RECTIFIER, SCREW
SCRN	SCREEN
SCR PR M	SCOOR PROTECTION MAT
SD	SHOWER DRAIN
SE	SAFETY EXHAUST
SEC.	SECOND, SECONDARY
SECT	SECTION
SEL	SELECTOR
SEP	SEPTEMBER
SEPR	SEPARATOR
SEQ	SEQUENCE

ABBREVIATION	WORD
SER	SERIES
SERV	SERVICE
SF	SUPPLY FAN
SH	SHEET, SUPERHEATER, SUPERHEAT, SHUNT
SHL	SHELL
SHPNG	SHIPPING
SIG	SIGNAL
SJAE	STEAM JET AIR EJECTOR
SIM	SIMILAR
SK	SKETCH
SL	SLAB
SL-CV	SOIL CANVAS
SLV	SLEEVE
S.O	SLIP ON
SOL	SOLENOID
SOLN	SOLUTION
SOV	SHUTOFF VALVE
SP	SINGLE-POLE, STATION POST INSULATOR, SPARE
SPDT	SINGLE-POLE DOUBLE-THROW
SPEC	SPECIFICATION
SPG	SPRING
SPLY	SUPPLY
SPP	STEAM POWER PLANT
SPST	SINGLE POLE SINGLE THROW
SQ	SQUARE
SS	SELECTOR SWITCH, STEAM SEAL, SYNCHRONIZING SWITCH, STATION SERVICE, SUSPENDED SOLID STEEL STRUCTURE
S/S	SUBSTATION
SST	STAINLESS STEEL
ST	STEAM, SHORT TIME, START
STA	STATION, STATIONARY
STA D	STATION DRAINAGE
STA R	STATION ROAD
ST-BY	STAND BY
STC	STEAM TEMPERATURE CONTROL
STD	STANDARD
STF	DENSE BURNISHED STEEL TROWEL FINISH
STG	STORAGE
STK	STACK
STL	STEEL
STMG	STEAMING
STN	STONE
STOR	STORAGE
STRG	STARTING
STR	STRUCTURAL, STARTING TRANSFORMER, STRAINER, STRUCTURE
SUB	SUBSTATION
SUCT	SUCTION
SUP	SUPPLY, SUPPORT
SUPSD	SUPERSEDED
SUPERSTR	SUPERSTRUCTURE
SURF	SURFACE
SUSP	SUSPENDED
SV	SOLENOID VALVE, SAFETY VALVE, SUPERVISION
SW	SWITCH, SERVICE WATER
SWBD	SWITCHBOARD
SWFD	SEAWATER FEED PUMP
SWGR	SWITCHGEAR
SWP	SERVICE WATER PUMP
SWYD	SWITCHYARD
SYM	SYMBOL
SYN	SYNCHRONOUS, SYNCHRONIZING

ABBREVIATION	WORD
SYNSCP	SYNCHROSCOPE
SYS	SYSTEM
	—T—
T	TEE, TREAD, TEMPERATURE, TIME, TON, TRANSPARENCY, THICKNESS
T/	TOP OF
TB	TERMINAL BOX, TRANSFER BUS, TERRAZZO BLOCK
TC	THERMOCOUPLE, TRIP COIL, TEMPERATURE CONTROLLER, TELE-CONTROL
TD	TIME DELAY, TERMINAL DIFFERENCE
TDDO	TIME DELAY DROPOUT
TDPU	TIME DELAY PICKUP
TE	TEMPERATURE ELEMENT
TECH	TECHNICAL
TEL	TELEPHONE
TEMP	TEMPERATURE, TEMPORARY
TERM	TERMINAL
T/G	TURBINE GENERATOR
THD	THREAD
THK	THICKNESS
TI	TEMPERATURE INDICATOR
TK	TANK
TL	TRANSMISSION LINE, TOTAL LOAD
TM	TELEMETERING
TOB	TOP OF BEAM
TOT	TOTAL
TR	TRANSFORMER, TRIP
TRANSF	TRANSFORMER
TRANS BR	TRANSFER BRIDGE
TREAT	TREATMENT
TRVLG	TRAVELING
TS	TEMPERATURE SWITCH, TEST SWITCH, TEST
TT FND	TRANSMISSION TOWER FOUNDATION
TURB	TURBINE
TV	TELEVISION
TW	TYPEWRITER
TYP	TYPICAL
	—U—
UF	UNLOADING FACILITY
UG	UNDERGROUND
UNFIN	UNFINISHED
UNIV	UNIVERSAL
UNL	UNLOADING
UPR	UPPER
UR	URINAL
UT	UTILITY
UV	UNDER VOLTAGE
	—V—
V	VELOCITY, VALVE, VOLT, VOLTMETER
VA	VOLT AMPERE
VAC	VACUUM
VAR	REACTIVE VOLT-AMPERE, VARIABLE, VARMETER
VARH	VAR-HOUR METER
VAT	VINYL ASBESTOS TILE
VB	VINYL BASE
VC	VINYL CLOTH

ABBREVIATION	WORD
VCB	VACUUM VALVE CIRCUIT BREAKER
VCM	VINYL COATED METAL
VDC	VIDEO CONTROLLER
VENT	VENTILATE, VENTILATING
VERT	VERTICAL
VIB	VIBRATE, VIBRATION
VM	VOLTMETER
VOL	VOLUME
VR	VOLTAGE REGULATOR
VS	VOLTMETER SWITCH, VENT STACK
	—W—
W	WASTE, WHITE, WATER, WATT, WATTMETER, WIDE, WIDTH
WA	WAINSCOT
WB	WATER BOX, WALL BUSHING
WC	WATER CLOSET
WCLD	WATERCOOLED
WCR	WATER COOLER
WD	WOOD, WINDOW DIMENSION
WF	WHARF
WH	WATT-HOUR
WHM	WATT-HOUR METER
WK	WEEK
WM	WATT METER
W.O	WIPE OUT
W/O	WITHOUT
WP	WEATHER PROOF, WORKING POINT, WORKING PRESSURE
WS	WEATHER STRIPPING
WT	WEIGHT, WATER TREATMENT
WTR	WATER
WVT	WITHSTAND VOLTAGE TEST
WW	WELL WATER
	—X—
XB	AUTOMATIC EXCHANGER
XMTR	TRANSMITTER
	—Y—
YD	YARD
YEL	YELLOW
YR	YEAR

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

ABBREVIATION LIST - 4

JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO JAPAN

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akira Oiwa		N.Kanehira	
DRAWING NO		SCALE	DATE
WGT-1002		NONE	10TH JAN 1990

MESSRS: KARACHI ELECTRIC SUPPLY CORPORATION

PROJECT: WEST WHARF THERMAL POWER PLANT PROJECT

SCHEDULE OF IMPLEMENTATION (TENTATIVE)

No. WGT-1003

DATE 10TH JAN 1990

DIV.

COPY TO

PROGRES MONTHS

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

MASTER SCHEDULE

UNIT 1 P/S M/F TSS BSS D/L BHT P/R I/F I/S C/O

UNIT 2 DM/S P/S M/F TSS BSS D/L BHT P/R I/F I/S C/O

LOT I

POWER PLANT EQUIPMENT & CIVIL AND ARCHITECTURAL

LOT I

C/S

UNIT 1

DESIGN & MANUFACTURING

SHIPPING P/S

FILING

M/F FOUND. UNIT 1 MAIN POWERHOUSE

TSS STEEL STRUCTURE

D/L CHIPPING

T/G PEDESTAL

T/G ERECTION

T/O I/S T/O UNIT 1 C/O

BOILER SHIPPING

T/G ROOM SHIPPING

ELECTRICAL ERECTION

P/R T/O

PREPARETION

BSS MAT FOUNDATION

BOILER STRUCTURE

D/L BOILER ERECTION

BHT BOILER ERECTION

T/O

AUX. FOUNDATION

AUX. ERECTION

T/O

DISCHARGE TUNNEL CONSTRUCTION

INTAKE CHANNEL, PUMP PIT CONSTRUCTION

CWP SCREEN ETC. INSTALLATION

PLANT WATER FOUNDATION & ERECTION

T/C

OUTDOOR PIPE SUPPORT FOUND. & ERECTION

ST/PIPE INSTALLATION

SUPER STRUCTURE

PLANT WATER OUTDOOR PIPE INSTALLATION

T/G ROOM SHIPPING

ELECTRICAL ERECTION P/R T/O

UNIT 2

DM/S P/S M/F TSS D/L CHIPPING T/G ERECTION T/O I/S UNIT 2 C/O

T/O

BSS MAT FOUND. T/G PEDESTAL BHT T/O

BOILER STRUCTURE D/L BOILER ERECTION BOILER ERECTION

BOILER SHIPPING

AUX FOUNDATION AUX. ERECTION T/O

'B' & 'BX' DISMANTLING BELOW GROUND

UNIT 1 P/S

DISCHARGE TUNNEL CONSTRUCTION

INTAKE CHANNEL PUMP PIT CONSTRUCTION CWP. SCREEN ETC. INSTALLATION

OUTDOOR PIPE SUPPORT FOUND. & ERECTION ST/PIPE INSTALLATION

LOT II

DISMANTLING WORKS

LOT II

C/S 'A' & FLATS 'B' & ABOVE GROUND 'BX' ABOVE GROUND

GP

ADMI BUILDING CONSTRUCTION

LOT IIA

SUBSTATION & GRID STATION

LOT IIA

C/S DESIGN & MANUFACTURING SHIPPING 220kv, 132kv INSTALLATION C/O TEST

FINISHING A/C VENT PLUMBING

PILE SHIPPING FILING FOUND STEEL SHIPPING STRUCTURE

CABLE TUNNEL CONSTRUCTION CABLING

PREPARETION

DISMANTLING 'B' DISCHARGE WAY INCLUDING TEMPO. WORK

LOT IIB

220/132kv TRANSMISSION LINE

LOT IIB

C/S DESIGN & MANUFACTURING SHIPPING TOWER ERECTION C/O TEST

TOWER FOUNDATION WORKS STRINGING

OWNER'S WORKS

SHIFTING WORKS OF 66KV OUTDOOR SWITCHYARD (9 MONTHS)

SHUT-DOWN OF 'BX'

C/S : CONTRACT SIGNING
P/S : PILING START
M/F : MAT FOUNDATION START
TSS : TURBINE STEEL STRUCTURE START
BSS : BOILER STEEL STRUCTURE START
D/L : DRUM LIFTING
BHT : BOILER HYDROSTATIC TEST
P/R : POWER RECEIVING
I/F : INITIAL FIRING
I/S : INITIAL STEAMING
C/O : COMMERCIAL OPERATION
T/O : TEST & TRIAL OPERATION
DM/S : DISMANTLING WORK START
AUX. : AUXILIARY EQUIPMENT
GP : GUARANTEE PERIOD
▭ : INTERNATIONAL TENDER
▭ : OWNER'S WORK
◉ : EVENT
◎ : KEY DATE OF THE CONTRACT

REMARKS

REV. No.	APPROVED BY	CHECKED BY	DRAWN BY
REV. DATE			
CONTENTS	Akira Otawa	S. Fujimaki	Ishizuka

EXISTING RCC CW PIPES

EXISTING RCC CULVERT

INTAKE OPEN CHANNEL

SCREEN & PUMP PIT

SCREEN & PUMP PIT

PIPE ROUTE

WASTE WATER PIT FOR STACK CLEANING

STACK

FLUE GAS DUCT

PIPE ROUTE

WAREHOUSE

ADMINISTRATION BUILDING

UNIT 2 BOILER

UNIT 2 MAIN POWERHOUSE

UNIT 1 MAIN POWERHOUSE

UNIT 1 BOILER

CABLE TUNNEL

DISCHARGE TUNNEL

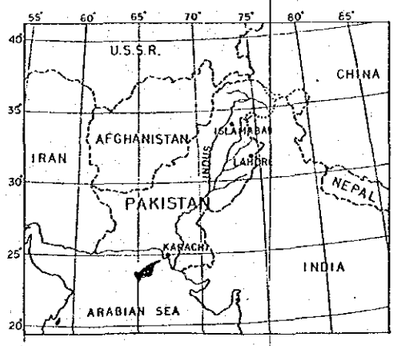
ORIGIN POINT(0,0)

LOT-II A | LOT-I

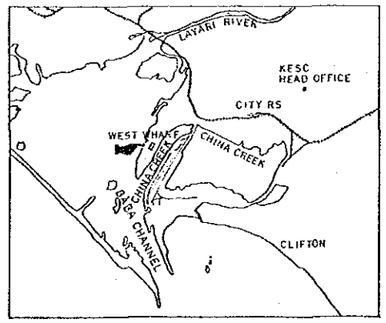
SITE LAYOUT PLAN

SCALE 1 : 500

No.	DESCRIPTION	No.	DESCRIPTION
1	Demineralized Water Tank	21	Turbine Oil Storage Tank
2	Raw WaterTank	22	Unit 2 Auxiliary Transformer
3	Chemical Storage Tank	23	Unit 2 Main Transformer
4	Water Treatment Equip. & Control Room	24	Unit 2 Unit Neutralizing Pit
5	Waste Water Treatment Area	25	Unit 2 Circulating Water Pump
6	Fuel Oil Storage Tank(Existing)	26	Unit 2 Make-up Water Tank
7	Fuel Oil Transfer Pump	27	Unit 2 Forced Draft Fan
8	Unit 1 Fuel oil Pump & Heater Area	28	Unit 2 Gas Recirculating Fan
9	Unit 1 Fuel oil Service Tank	29	Raw Water Pretreatment Area
10	Chlorination Equip. Area & Control Room	30	Unit 2 Fuel oil Pump & Heater Area
11	Air Foam Equipment Area	31	Unit 2 Fuel oil Service Tank
12	Unit 1 Forced Draft Fan	32	House Boiler Area
13	Unit 1 Gas Recirculating Fan	33	Guard House
14	Unit 1 Make-up Water Tank	34	H_2 Gas Generating Room
15	Chlorination Feed Water Pump Pit	35	Storage Box for Stop Log
16	Unit 1 Circulating Water Pump	36	Existing Gas Station(Sui Gas)
17	Unit 1 Unit Neutralizing Pit	37	132kV Substation
18	Unit 1 Main Transformer	38	220kV Substation
19	Unit 1 Auxiliary Transformer	39	66kV Switchyard Indoor(Existing)
20	Starting Transformer	40	11kV Grid Station(Existing)



PAKISTAN MAP



LOCATION MAP

ORIGIN POINT +Y −X +X −Y

GRAPHIC SCALE

0 5 10 20 30 m

SCALE 1 : 500

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

SITE LAYOUT PLAN

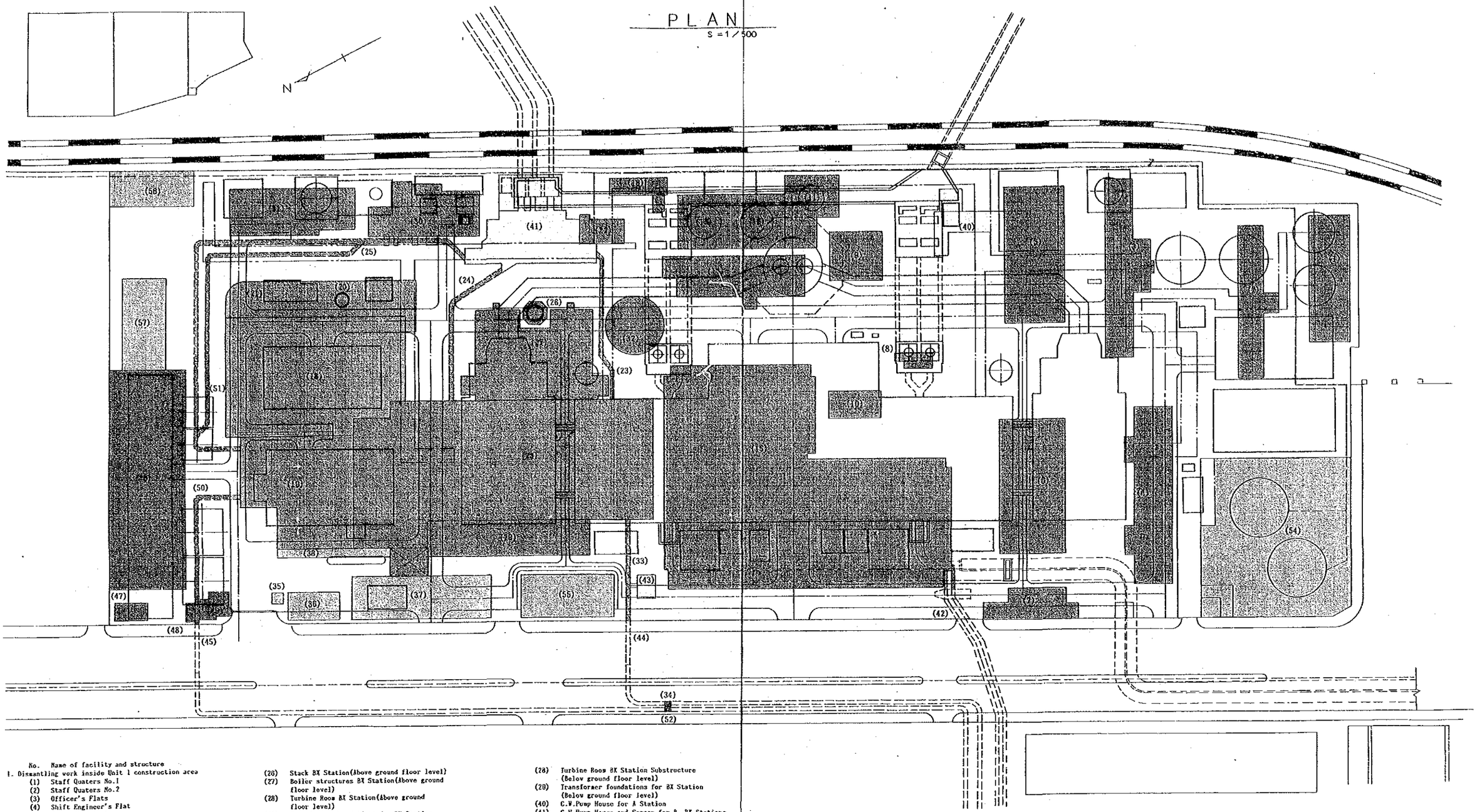
JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO JAPAN

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
DRAWING NO.	SCALE	DATE	
WAT − 1001	1 : 500	10 JAN. 1990	

PLAN

S = 1 / 500



No. Name of facility and structure

1. Dismantling work inside Unit 1 construction area
   - (1) Staff Quaters No.1
   - (2) Staff Quaters No.2
   - (3) Officer's Flats
   - (4) Shift Engineer's Flat
   - (5) Store Shed No.1
   - (6) Store Shed No.2
   - (7) Canteen
   - (8) Underground Tank
   - (9) Ground Reservoir
   - (10) Wall
   - (11) Oil Tank No.1
   - (12) Oil Tank No.2
   - (13) Oil Tank No.3
   - (14) Instrument and Control Room
   - (15) A Station (Boiler and Turbine Room)
   - (18) Sanitary Block and Sewage Pump room
   - (17) Also, roads, trees, drainage facilities, cables and etc. inside of Unit 1 area

2. Dismantling work inside of Unit 2 construction area

   Category B Station
   - (18) Boiler Room B Station Superstructure(Above ground floor level)
   - (19) Turbine Room B Station Including Transformer Bay(Above ground floor level)
   - (20) Stack B Station(Above ground floor level)
   - (21) Misc. Foundations and Wall(Above ground floor level)

   Category BX Station
   - (22) Switch Room
   - (23) Intake Water Pipe for BX Station No.1
   - (24) Intake Water Pipe for BX Station No.2
   - (25) Intake Water Pipe for B Station
   - (26) Stack BX Station(Above ground floor level)
   - (27) Boiler structures BX Station(Above ground floor level)
   - (28) Turbine Room BX Station(Above ground floor level)
   - (29) Transformer foundations for BX Station (Above ground floor level)
   - (30) Electric Shop, Raw Water Service Pump etc.
   - (31) Machine Shop and Store
   - (32) C.W.Tank
   - (33) Discharge Water Pipe for BX Station
   - (34) Closing work of C.W.Discharge Line for BX Station at Terminal Chamber

   Category Administration Building
   - (35) Guard house
   - (36) Car Parking
   - (37) Administration Building
   - (38) Cable Trench
   - (39) Also, roads,trees, drainage facilities, cables and etc. inside of Unit 2 area

3. Dismantling works to be carried out by Lot-I Contractor
   - (18) Boiler Room B Station Substructure(Below ground floor level)
   - (19) Turbine Room B Station Substucture including Transformer Bay(Below ground floor level)
   - (20) Stack B Station Substructure(Below ground floor level)
   - (21) Misc. Foundations and Wall(Below ground floor level)
   - (26) Stack BX Station Substructure(Below ground floor level)
   - (27) Boiler structures BX Station Substructure (Below ground floor level)
   - (28) Turbine Room BX Station Substructure (Below ground floor level)
   - (29) Transformer foundations for BX Station (Below ground floor level)
   - (40) C.W.Pump House for A Station
   - (41) C.W.Pump House and Screen for B, BX Stations
   - (42) Discharge Sump for A Station
   - (43) Sewer Sump and Pumping Station
   - (44) C.W.Discharge Pipe for BX Station (partial)
   - (45) C.W.Discharge Pipe for B Station (partial)

4. Dismantling works to be carried out by Lot-II A Contractor
   - (48) 66kV Switchyard (outdoor)
   - (47) Pressure Tank
   - (48) City Water receiving Pit
   - (49) Dispensary
   - (50) Discharge Water Pipe for B Station (partial)
   - (51) Intake Water Pipe for B Station (partial)
   - (52) Closing work of C.W.Discharge Line for B Station at Terminal Chamber
   - (53) Also, roads,trees, drainage facilities, cables and etc. inside of Substation area and Transformer yard area

5. Structures not to be dismantled at this Project
   - (54) Fuel Oil Storage Tanks
   - (55) 11kV Switchgear Building
   - (56) Sui Gas Compound
   - (57) 66kV Switch Station Building

LEGEND :

Color	Structure No.	Area of Dismantle	Contractors
	(1) - (17)	Category"A" & Flats	Lot-III
	(18) - (21)	Category"B"	Lot-III
	(18) - (21)	Category"B" Substructure	Lot- I
	(22) - (34)	Category"BX"	Lot-III
	(26) - (29)	Category"BX" Substructure	Lot- I
	(35) - (39)	Category Adai.	Lot-III
	(40) - (45)		Lot- I
	(46) - (53)	Category Substation	Lot- II A
	(54) - (57)	Not to be dismantled	

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

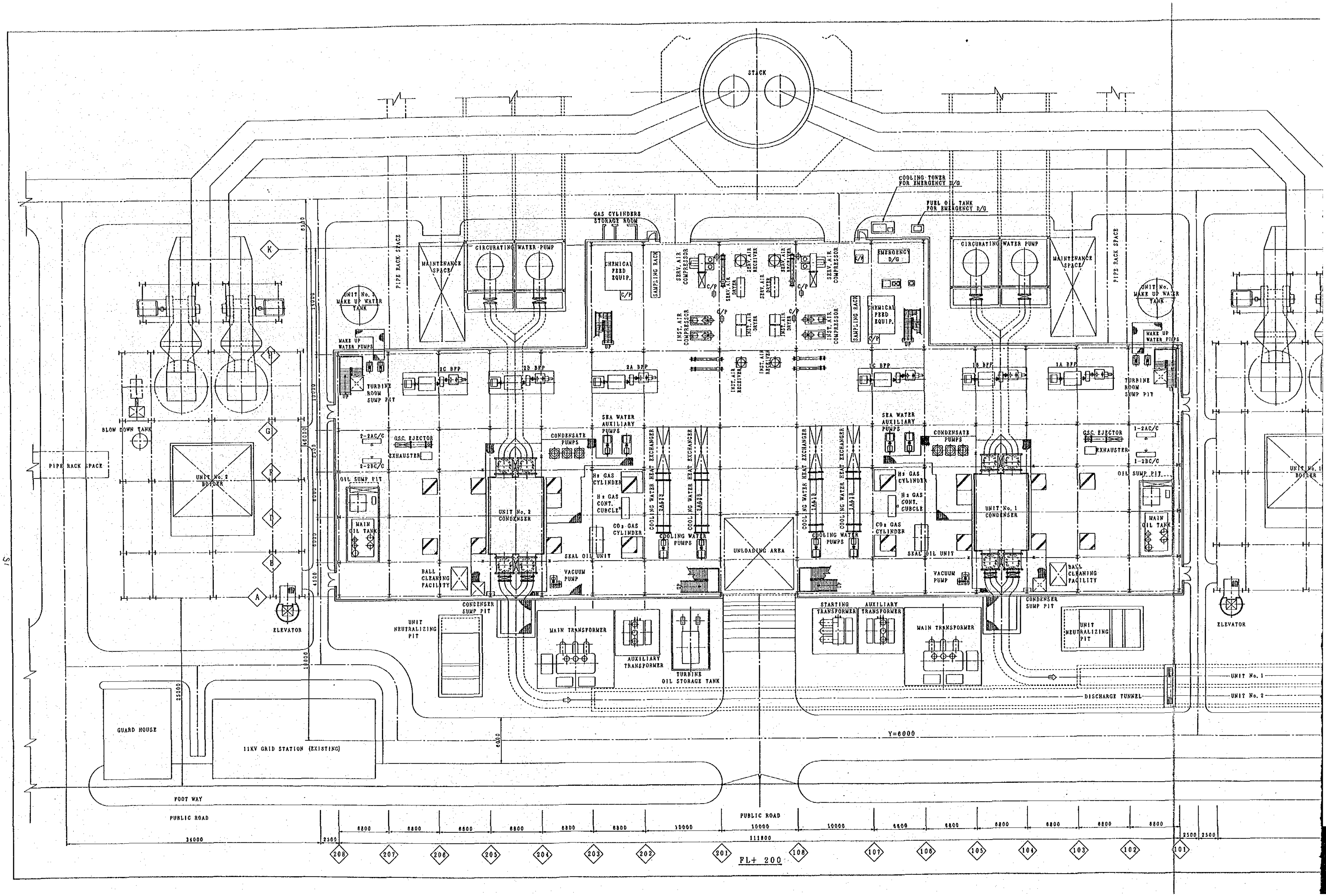
UNITS NO.1 AND NO.2

INTERFACE BETWEEN EXISTING AND PLANNED SITE LAYOUT

JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO JAPAN

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Ohira	-	S. Fujimoto	
DRAWING NO.		SCALE	DATE
WAT - 1002		1 / 500	10TH JAN 1990


STACK
COOLING TOWER FOR EMERGENCY D/G
FUEL OIL TANK FOR EMERGENCY D/G
GAS CYLINDERS STORAGE ROOM
PIPE RACK SPACE
MAINTENANCE SPACE
CIRCURATING WATER PUMP
CHEMICAL FEED EQUIP.
SAMPLING RACK
SERV. AIR COMPRESSOR
SERV. AIR RECEIVER
SERV. AIR DRYER
INST. AIR COMPRESSOR
INST. AIR DRYER
INST. AIR RECEIVER
EMERGENCY D/G
UNIT No. 2 MAKE UP WATER TANK
UNIT No. 1 MAKE UP WATER TANK
MAKE UP WATER PUMPS
TURBINE ROOM SUMP PIT
2C BFP
2B BFP
2A BFP
1C BFP
1B BFP
1A BFP
BLOW DOWN TANK
PIPE RACK SPACE
UNIT No. 2 BOILER
UNIT No. 1 BOILER
2-2AC/C
2-2BC/C
1-2AC/C
1-2BC/C
G.S.C. EJECTOR
EXHAUSTER
OIL SUMP PIT
MAIN OIL TANK
SEA WATER AUXILIARY PUMPS
CONDENSATE PUMPS
H_2 GAS CYLINDER
H_2 GAS CONT. CUBCLE
CO_2 GAS CYLINDER
COOLING WATER HEAT EXCHANGER
COOLING WATER PUMPS
UNIT No. 2 CONDENSER
UNIT No. 1 CONDENSER
SEAL OIL UNIT
UNLOADING AREA
BALL CLEANING FACILITY
VACUUM PUMP
CONDENSER SUMP PIT
ELEVATOR
UNIT NEUTRALIZING PIT
MAIN TRANSFORMER
AUXILIARY TRANSFORMER
STARTING TRANSFORMER
TURBINE OIL STORAGE TANK
UNIT No. 1
UNIT No. 2
DISCHARGE TUNNEL
Y=6000
GUARD HOUSE
11KV GRID STATION (EXISTING)
FOOT WAY
PUBLIC ROAD
PUBLIC ROAD
34000
2500
111800
10000
6800
FL+ 200
208
207
206
205
204
203
202
201
108
107
106
105
104
103
102
101
K
H
G
F
D
B
A

STACK

COOLING TOWER FOR EMERGENCY D/G

FUEL OIL TANK FOR EMERGENCY D/G

GAS CYLINDERS STORAGE ROOM

CIRCURATING WATER PUMP

CHEMICAL FEED EQUIP.

SAMPLING RACK

SERV. AIR COMPRESSOR

SERV. AIR RECEIVER

SERV. AIR DRYER

INST. AIR COMPRESSOR

INST. AIR DRYER

INST. AIR RECEIVER

EMERGENCY D/G

MAINTENANCE SPACE

PIPE RACK SPACE

UNIT No. MAKE UP WATER TANK

MAKE UP WATER PUMPS

2B BFP

2A BFP

1C BFP

1B BFP

1A BFP

TURBINE ROOM SUMP PIT

SEA WATER AUXILIARY PUMPS

CONDENSATE PUMPS

H₂ GAS CYLINDER

H₂ GAS CONT. CUBCLE

CO₂ GAS CYLINDER

COOLING WATER HEAT EXCHANGER

COOLING WATER PUMPS

GSC EJECTOR

EXHAUSTER

1-2AC/C

1-2BC/C

OIL SUMP PIT

MAIN OIL TANK

BLOW DOWN TANK

UNIT No. 1 BOILER

PIPE RACK SPACE

UNIT No. 2 CONDENSER

UNIT No. 1 CONDENSER

SEAL OIL UNIT

VACUUM PUMP

UNLOADING AREA

BALL CLEANING FACILITY

CONDENSER SUMP PIT

ELEVATOR

MAIN TRANSFORMER

AUXILIARY TRANSFORMER

TURBINE OIL STORAGE TANK

STARTING TRANSFORMER

AUXILIARY TRANSFORMER

MAIN TRANSFORMER

UNIT NEUTRALIZING PIT

UNIT No. 1

UNIT No. 2

DISCHARGE TUNNEL

Y=8000

PUBLIC ROAD

6800 6800 6800 10000 10000 10000 6800 6800 6800 6800 6800 6800

111800

2500 2500 33500

8000

204 203 202 201 108 107 106 105 104 103 102 101

FL+ 200

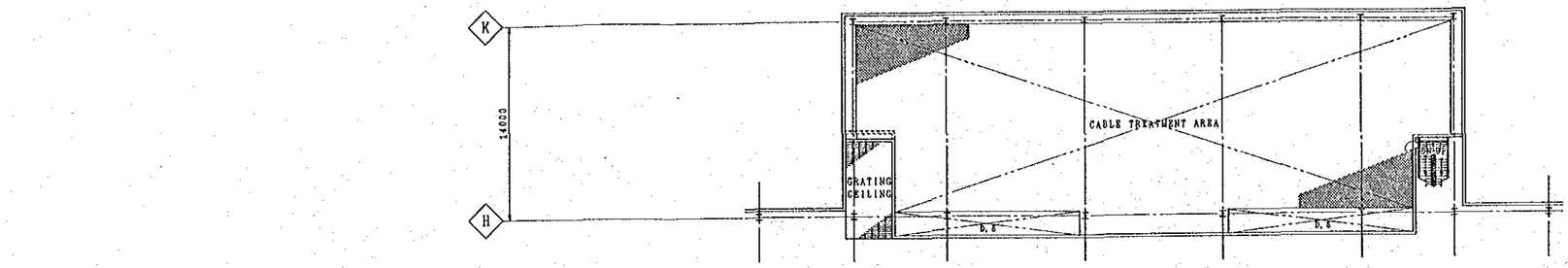
REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2

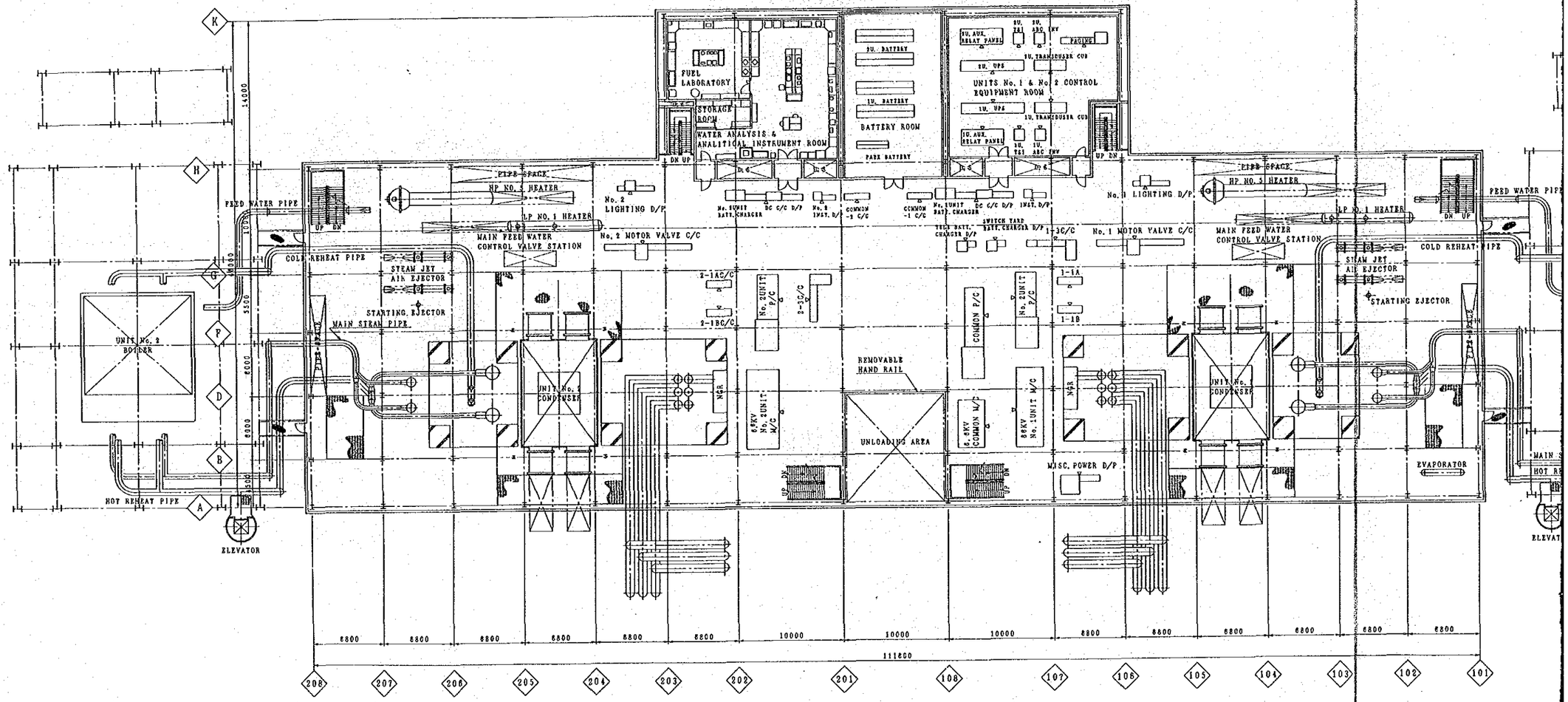
MAIN POWER HOUSE GENERAL ARRANGEMENT GROUND FLOOR

JAPAN INTERNATIONAL COOPERATION AGENCY

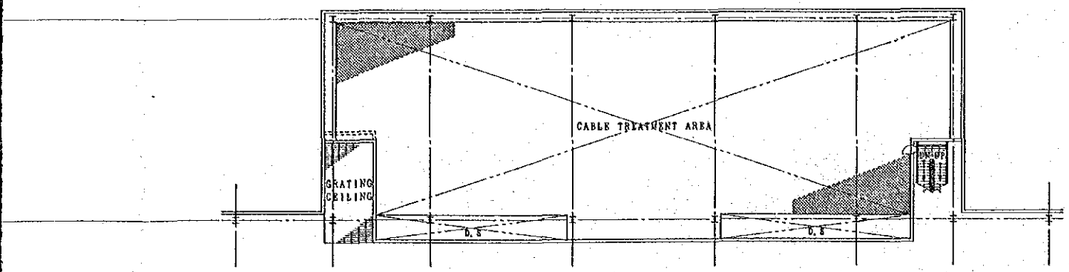
APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Ohwa		M. Kaneko	Eghoshi
DWG NO. WGT-1101		SCALE 1/200	DATE 10TH JAN 1990



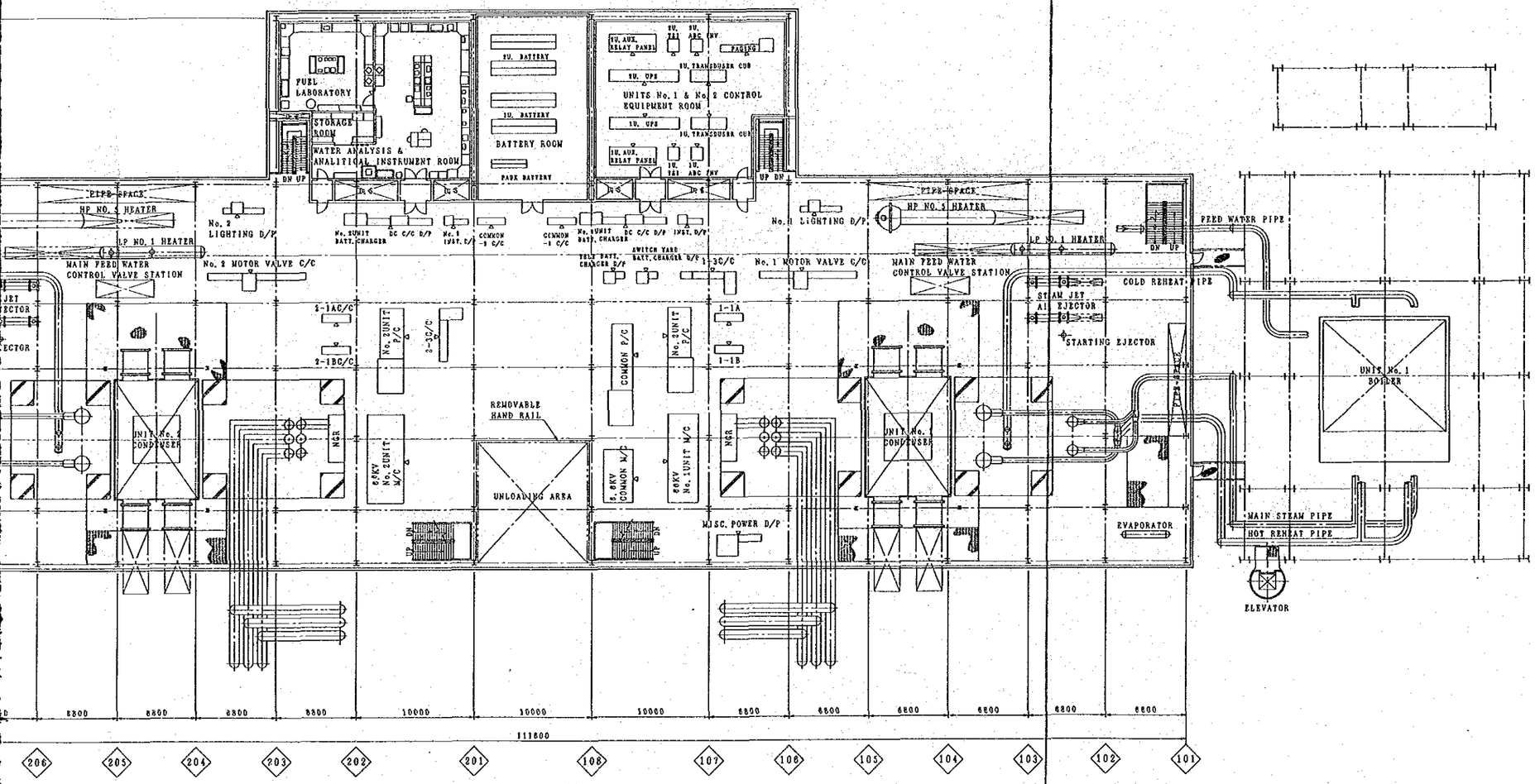
FL+ 8550



FL+ 5500



PL+ 8550



FL+ 5500

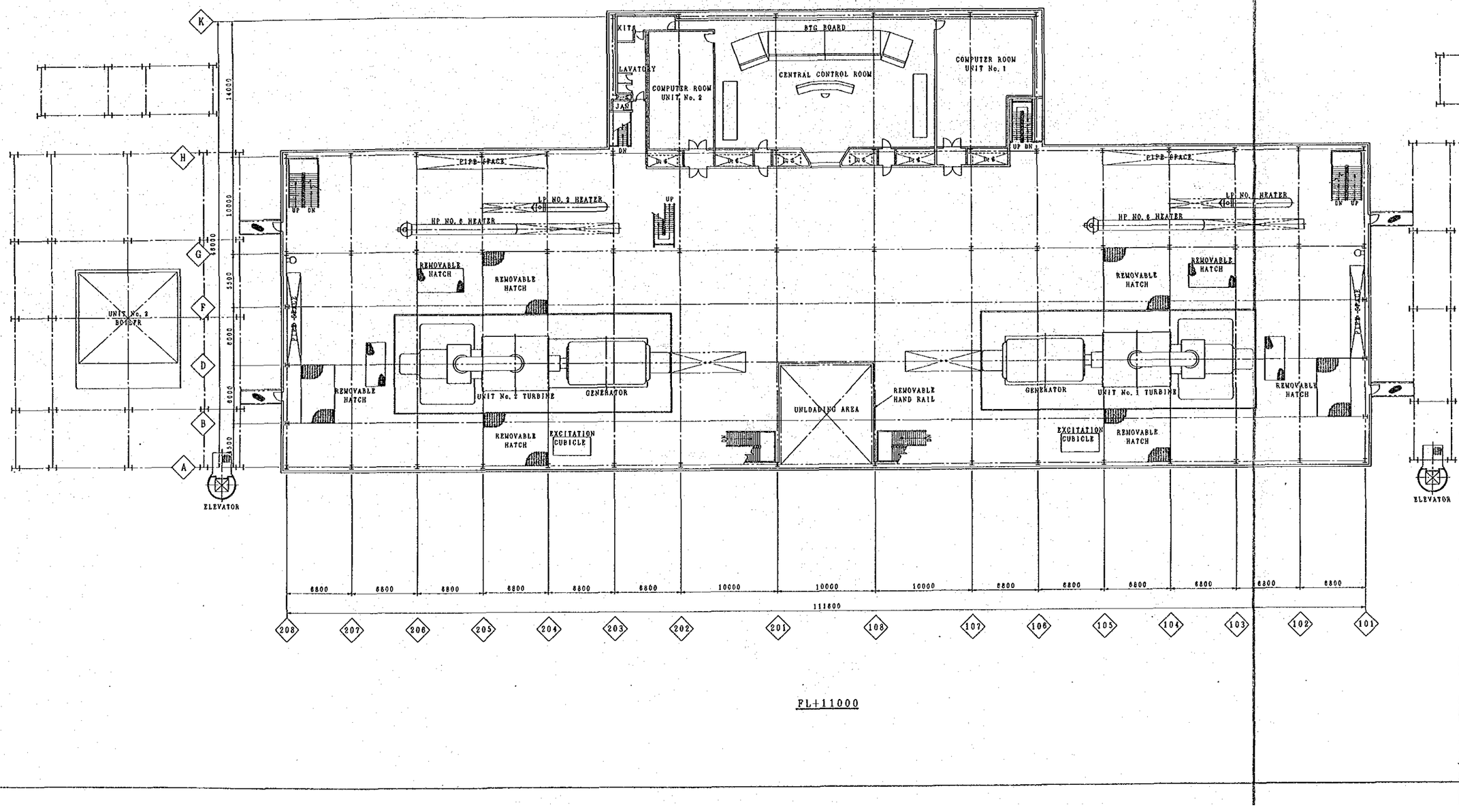
REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

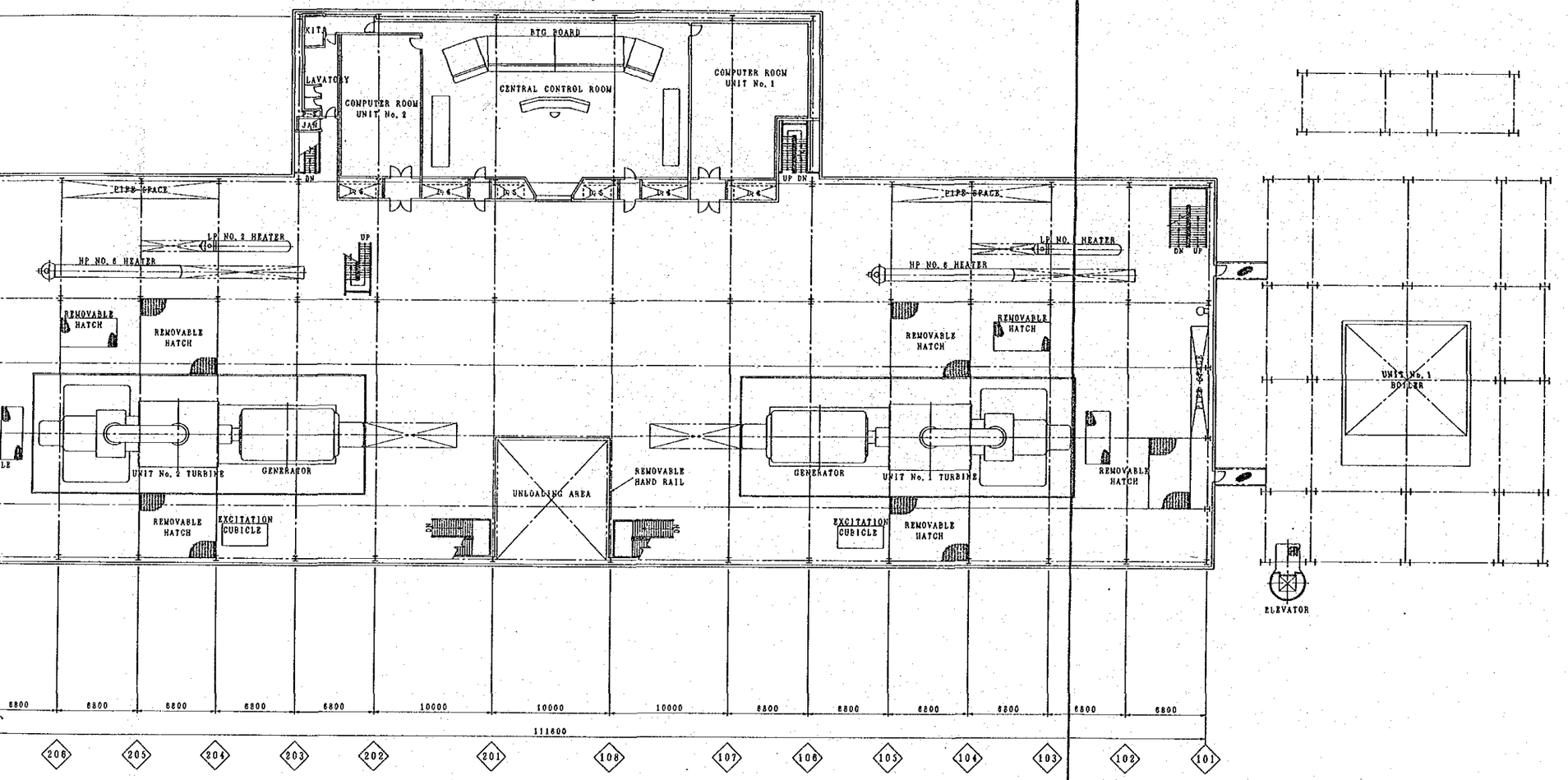
PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2

MAIN POWER HOUSE
GENERAL ARRANGEMENT MEZZANINE FLOOR

JAPAN INTERNATIONAL COOPERATION AGENCY

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa		H. Kanehara	
DWG NO.		SCALE	DATE
WGT-1102		1/200	10TH JAN 1990


K
H
G
F
D
B
A
14000
10000
5500
6000
6000
5500
UNIT No. 2 BOILER
ELEVATOR
KITA
LAVATORY
JAN
DN
COMPUTER ROOM UNIT No. 2
BTG BOARD
CENTRAL CONTROL ROOM
COMPUTER ROOM UNIT No. 1
UP DN
PIPE SPACE
LP NO. 3 HEATER
HP NO. 6 HEATER
UP
REMOVABLE HATCH
UNIT No. 2 TURBINE
GENERATOR
EXCITATION CUBICLE
UNLOADING AREA
REMOVABLE HAND RAIL
LP NO. 1 HEATER
UNIT No. 1 TURBINE
6800
10000
111800
208
207
206
205
204
203
202
201
108
107
106
105
104
103
102
101
FL+11000



FL+11000

REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2

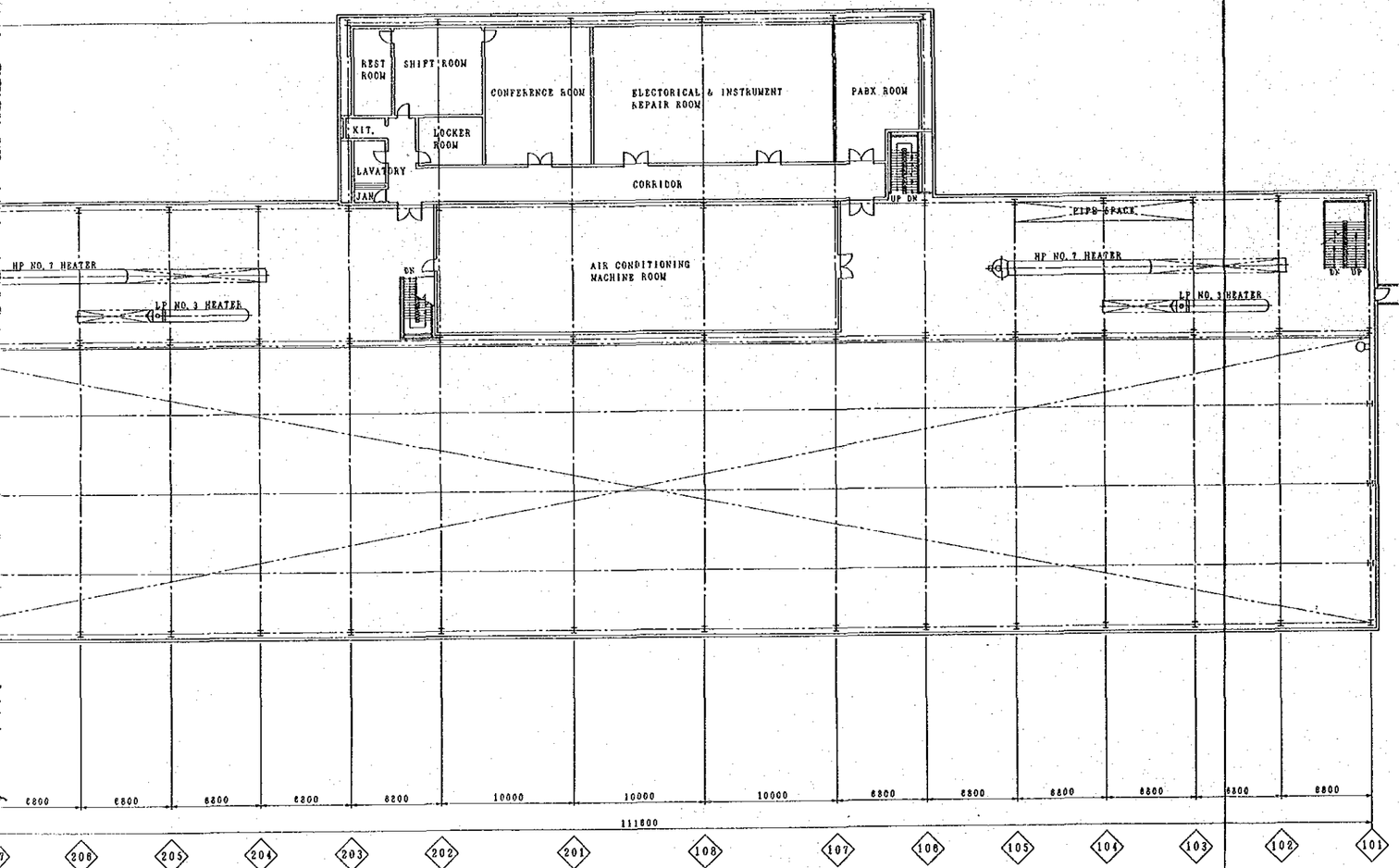
MAIN POWER HOUSE
GENERAL ARRANGEMENT OPERATING FLOOR

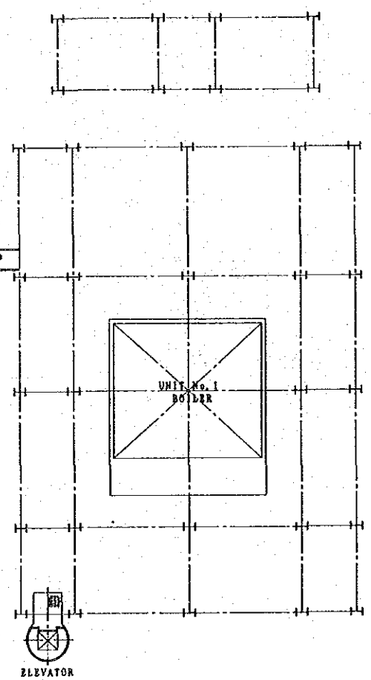
JAPAN INTERNATIONAL COOPERATION AGENCY

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa		H. Kanehara	
DWG NO.		SCALE	DATE
WGT-1103		1/200	10TH JAN 1990

REST ROOM
SHIFT ROOM
CONFERENCE ROOM
ELECTORICAL & INSTRUMENT REPAIR ROOM
PABX ROOM
EXIT.
LOCKER ROOM
LAVATORY
JAN
CORRIDOR
UP DN
PIPE SPACE
HP NO. 1 HEATER
LP NO. 3 HEATER
AIR CONDITIONING MACHINE ROOM
HP NO. 3 HEATER
LP NO. 3 HEATER
UP DN
DN
UNIT No. 2 BOILER
ELEVATOR
ELEVATOR
14000
10000
5200
6000
6000
4200
6800 6800 6800 6800 6800 6800 10000 10000 10000 6800 6800 6800 6800 6800 6800
111600
208 207 206 205 204 203 202 201 108 107 106 105 104 103 102 101
K
H
G
F
D
B
A

FL+16000





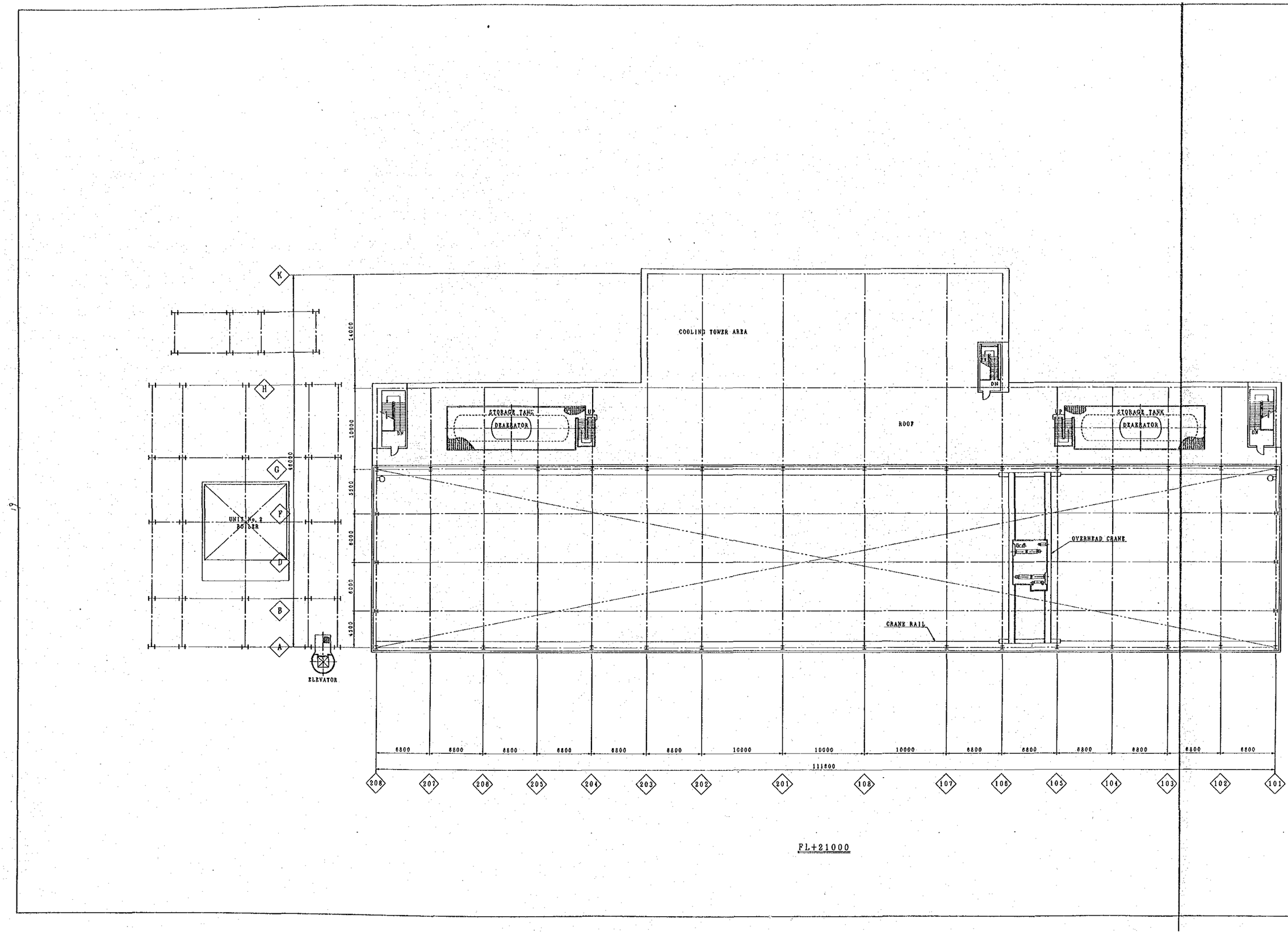
REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

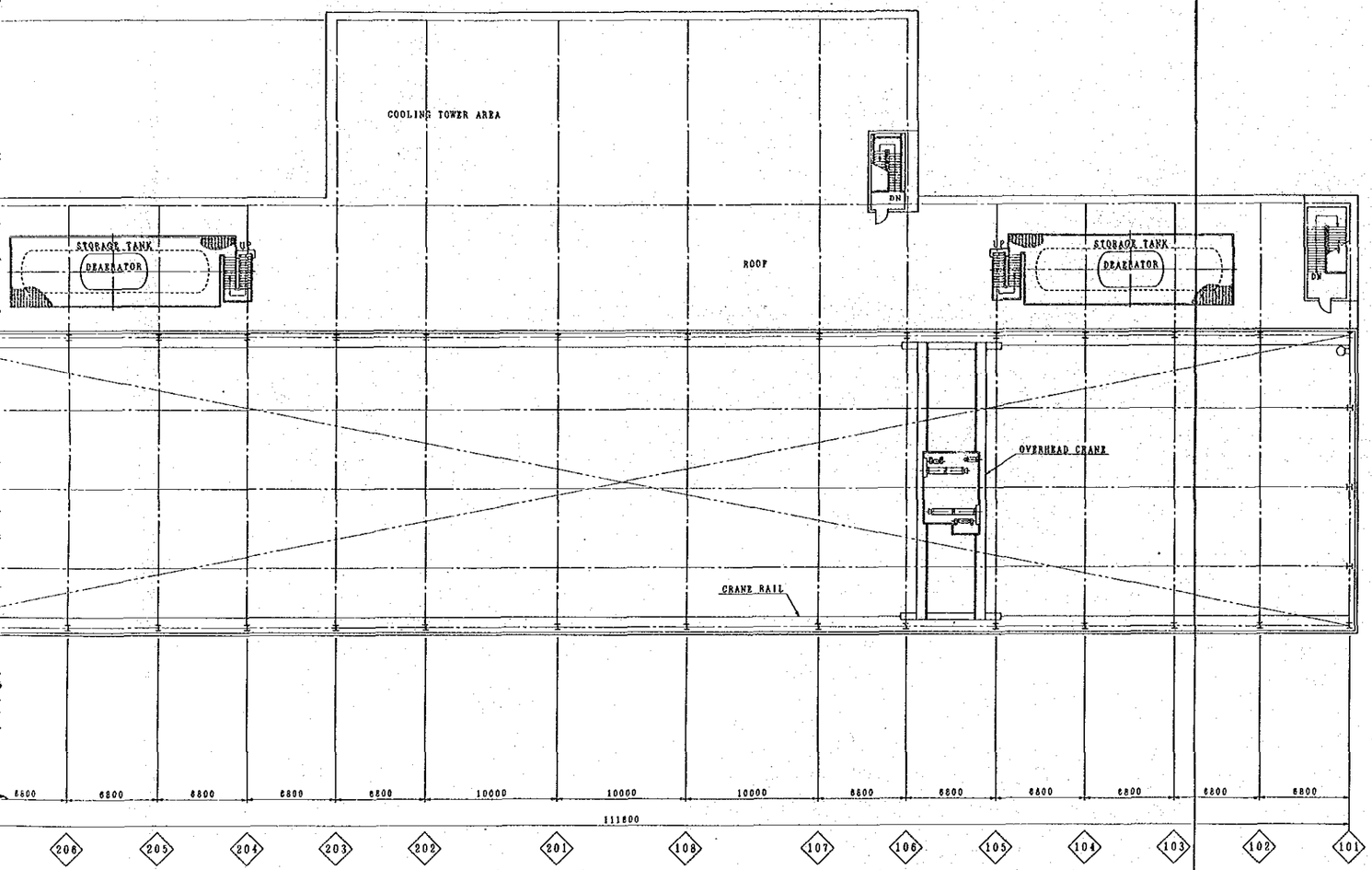
PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2

MAIN POWER HOUSE
GENERAL ARRANGEMENT 4TH FLOOR

JAPAN INTERNATIONAL COOPERATION AGENCY

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa		M. Kamiura	Hiroshi
DWG NO. WGT-1104		SCALE 1/200	DATE 10TH JAN 1990


K
H
G
F
D
B
A
14000
10000
6000
5500
6000
6000
4500
UNIT No. 2
BOILER
ELEVATOR
COOLING TOWER AREA
ROOF
STORAGE TANK
DEARERATOR
UP
DN
OVERHEAD CRANE
CRANE RAIL
6800
6800
6800
6800
6800
6800
10000
10000
10000
6800
6800
6800
6800
6800
6800
111800
208
207
206
205
204
203
202
201
108
107
106
105
104
103
102
101
FL+21000



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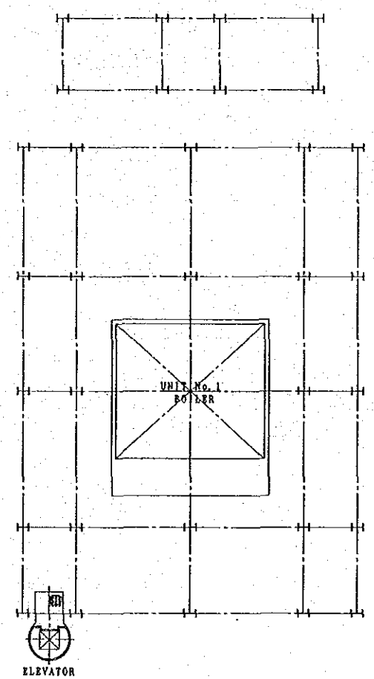
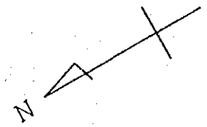




REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

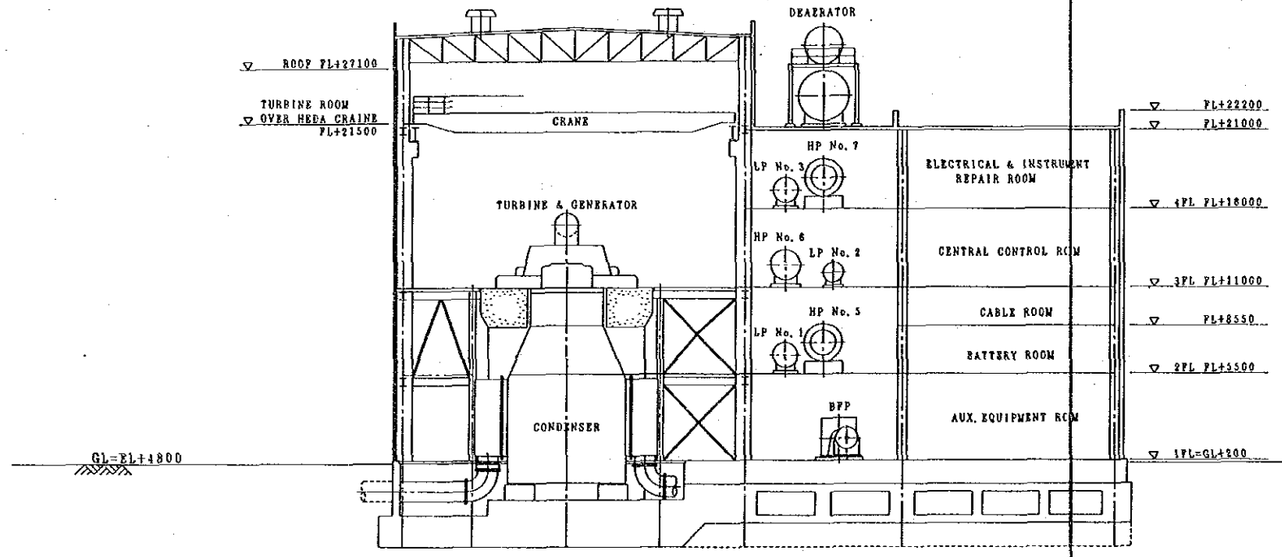
PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION

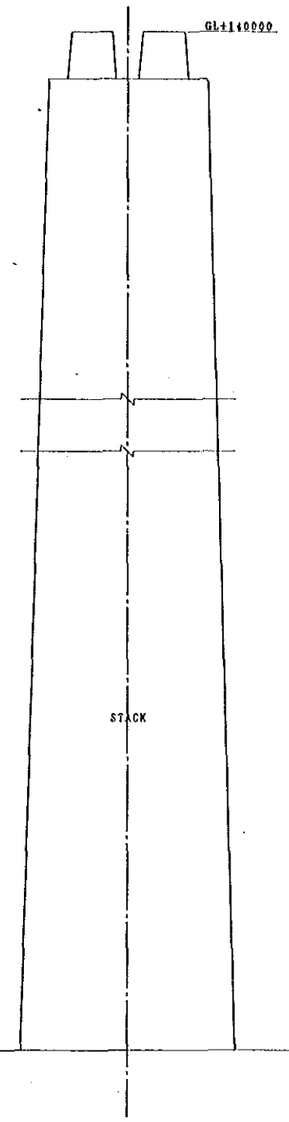
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2

MAIN POWER HOUSE
GENERAL ARRENGEMENT 5TH FLOOR

JAPAN INTERNATIONAL COOPERATION AGENCY

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa		M. Kanekawa	
DWG NO.	SCALE	DATE	
WGT-1105	1/200	10TH JAN 1980	





REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

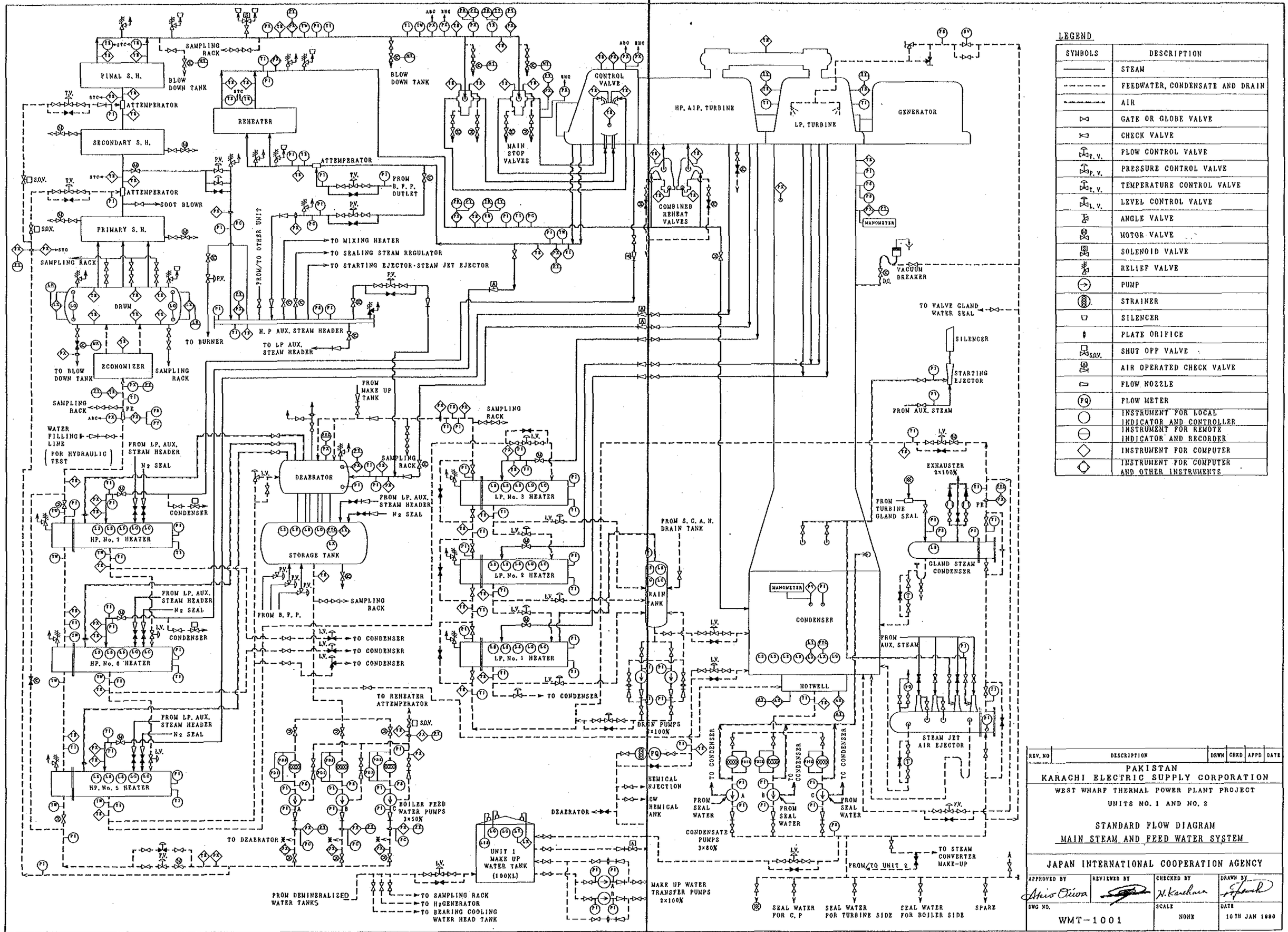
UNITS NO. 1 AND NO. 2

MAIN POWER HOUSE
GENERAL ARRANGEMENT SECTION

JAPAN INTERNATIONAL COOPERATION AGENCY

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Otwa		Y. Kashara	
DWG NO. WGT-1106		SCALE 1/200	DATE 10TH JAN 1990

20



LEGEND

SYMBOLS	DESCRIPTION
	STEAN
	FEEDWATER, CONDENSATE AND DRAIN
	AIR
	GATE OR GLOBE VALVE
	CHECK VALVE
F. V.	FLOW CONTROL VALVE
P. V.	PRESSURE CONTROL VALVE
T. V.	TEMPERATURE CONTROL VALVE
L. V.	LEVEL CONTROL VALVE
	ANGLE VALVE
M	MOTOR VALVE
S	SOLENOID VALVE
	RELIEF VALVE
	PUMP
	STRAINER
	SILENCER
	PLATE ORIFICE
S.O.V.	SHUT OFF VALVE
A	AIR OPERATED CHECK VALVE
	FLOW NOZZLE
FQ	FLOW METER
	INSTRUMENT FOR LOCAL INDICATOR AND CONTROLLER
	INSTRUMENT FOR REMOTE INDICATOR AND RECORDER
	INSTRUMENT FOR COMPUTER
	INSTRUMENT FOR COMPUTER AND OTHER INSTRUMENTS

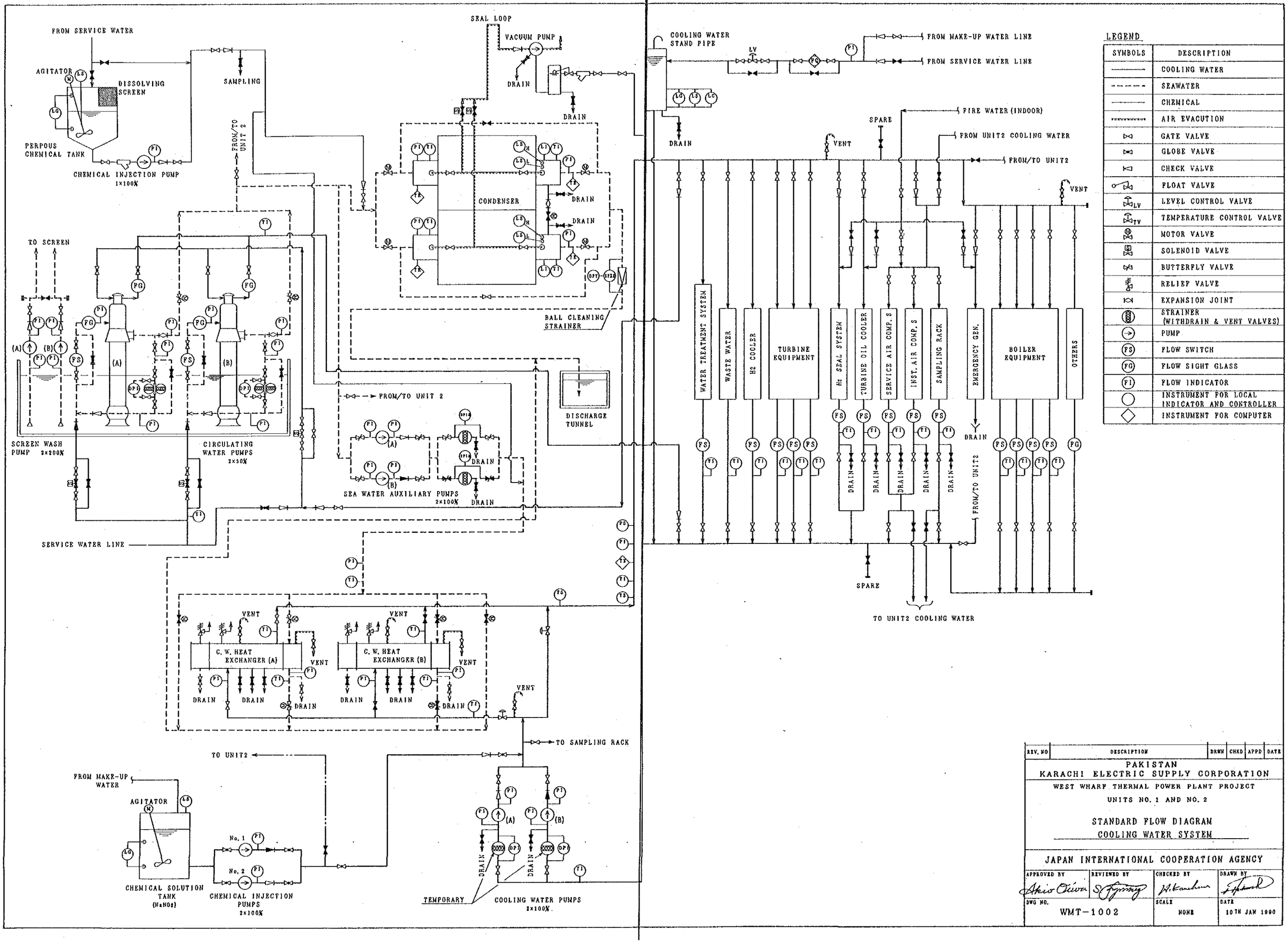
REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2

STANDARD FLOW DIAGRAM
MAIN STEAM AND FEED WATER SYSTEM

JAPAN INTERNATIONAL COOPERATION AGENCY

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Okiwa		N. Kashara	
DWG NO.		SCALE	DATE
WMT-1001		NONE	10TH JAN 1990



LEGEND

SYMBOLS	DESCRIPTION
	COOLING WATER
	SEAWATER
	CHEMICAL
	AIR EVACUTION
	GATE VALVE
	GLOBE VALVE
	CHECK VALVE
	FLOAT VALVE
LV	LEVEL CONTROL VALVE
TV	TEMPERATURE CONTROL VALVE
	MOTOR VALVE
	SOLENOID VALVE
	BUTTERFLY VALVE
	RELIEF VALVE
	EXPANSION JOINT
	STRAINER (WITHDRAIN & VENT VALVES)
	PUMP
FS	FLOW SWITCH
FG	FLOW SIGHT GLASS
FI	FLOW INDICATOR
	INSTRUMENT FOR LOCAL INDICATOR AND CONTROLLER
	INSTRUMENT FOR COMPUTER

REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2

STANDARD FLOW DIAGRAM
COOLING WATER SYSTEM

JAPAN INTERNATIONAL COOPERATION AGENCY

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Okiwa	S. Fujimoto	H. Kamehara	
DWG NO. WMT-1002	SCALE NONE	DATE 10TH JAN 1990	

FINAL S. H.

SECONDALY S. H.

PRIMARY S. H.

ATTEMPERATOR

FROM BFPT

TO SOOT BLOWER

DRAIN TO BLOW DOWN TANK

TO DEAERATOR

TO BURNER ATMIZING

TO STEAM AIR EJECTOR AND STARTING EJECTOR

FROM CRH STEAM

TO CONNECTION LINE BETWEEN UNIT 1 & 2

SPARE NOZZLE

DRAIN TO BLOW DOWN TANK

H. P. AUX. STEAM HEADER

L. P. AUX. STEAM HEADER

DRAIN TO BLOW DOWN TANK

TO DEA. BEARING

TO TURBINE SSR

DRAIN TO BLOW DOWN TANK

FROM HOUSE BOILER

TO MIXING HEATER

SPARE NOZZLE

DRAIN

SCAH

SCAH

SCAH DRAIN TANK

TO BLOW DOWN TANK

TO CONDENSER

TO LP HEATER DRAIN TANK

TO ATOMSPHERE

DEAERATOR

VENT

DRAIN

STEAM CONVERTER

HEAVY OIL HEATERS

SUCTION HEATERS

HEAVY OIL SERVICE TANK BOTTOM HEATERS

STEAM TRACE FOR PIPES

FOR WATER TREATMENT

SPARE

PIT DRAIN

DRAIN

FROM UNIT 2 AUX. STEAM

DRAIN TANK

DRAIN

DRAIN PUMP 1×100%

TO CONDENSER UNIT 1

TO CONDENSER UNIT 2

TO LP HTR DRAIN TANK UNIT 1

TO LP HTR DRAIN TANK UNIT 2

DRAIN TO ATMOSPHERE

STEAM CONVERTER DRIN COOLER

DRAIN

TO ATMOSPHERE

STEAM CONVERTER CONDENSATE DRAIN TANK

DRAIN

FROM CONDENSATE WATER PUMPS

FROM SERVICE WATER PUMPS

STEAM CONVERTER FEEDWATER PUMPS 2×100%

SYMBOLS

SYMBOLS	DESCRIPTION
———	STEAM
- - - -	WATER
———	DRAIN
———	EQUALIZING LINE
⋈	GATE OR GLOBE VALVE
⋈	CHECK VALVE
PV	PRESS. CONTROL VALVE
TV	TEMP. CONTROL VALVE
	RELIEF VALVE
M	MOTOR VALVE
T	TRAP
	PLATE ORIFICE
	PUMP
	STRAINER
LS	LEVEL SWITCH
LC	LEVEL CONTROLLER
LG	LEVEL GAUGE
PS	PRESS. SWITCH
PC	PRESS. CONTROLLER

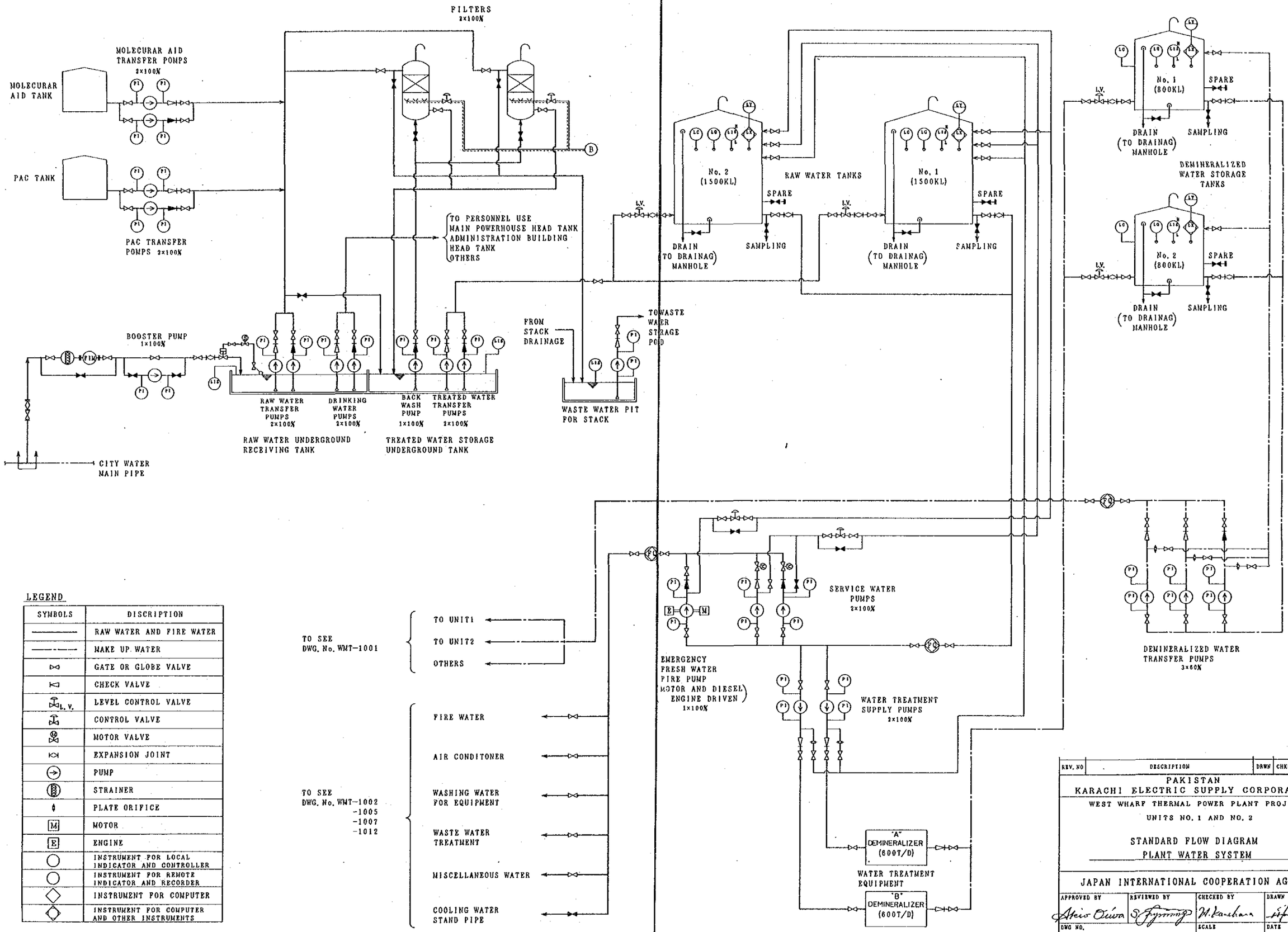
REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2

STANDARD FLOW DIAGRAM
AUXILIARY STEAM SYSTEM

JAPAN INTERNATIONAL COOPERATION AGENCY

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Ueda		Y. Kamikawa	
DWG NO. WMT-1003		SCALE NONE	DATE 10 TH JAN 1990



LEGEND

SYMBOLS	DISCRIPTION
———	RAW WATER AND FIRE WATER
——·——	MAKE UP WATER
⋈	GATE OR GLOBE VALVE
⋈	CHECK VALVE
L.V.	LEVEL CONTROL VALVE
	CONTROL VALVE
M	MOTOR VALVE
⋈	EXPANSION JOINT
	PUMP
	STRAINER
	PLATE ORIFICE
M	MOTOR
E	ENGINE
	INSTRUMENT FOR LOCAL INDICATOR AND CONTROLLER
	INSTRUMENT FOR REMOTE INDICATOR AND RECORDER
	INSTRUMENT FOR COMPUTER
	INSTRUMENT FOR COMPUTER AND OTHER INSTRUMENTS

REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2

STANDARD FLOW DIAGRAM
PLANT WATER SYSTEM

JAPAN INTERNATIONAL COOPERATION AGENCY

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Ohwa	S. Fujimoto	M. Kanehara	
DWG NO.	SCALE	DATE	
WMT-1004	NONE	10TH JAN 1990	

LEGEND

SYMBOLS	DESCRIPTION
———	FRESH WATER
- - - - - - -	AIR FOAM
⋈	GATE OR GLOBE VALVE
⋈	CHECK VALVE
⋈ M	MOTOR VALVE
⋈ S	SOLENOID VALVE
⋈ PV	PRESSURE CONTROL VALVE
⋈	EXPANSION JOINT
→	PUMP
⊠	STRAINER
M	MOTOR
E	ENGINE
◎	HYDRANT (FRESH WATER)
▬	FRESH WATER HOSE BOX
▬	AIR FOAM HYDRANT HOSE BOX
▣	AIR FOAM CHANBER
FX	FLOW TRANSMITTER
○	INSTRUMENT FOR LOCAL INDICATOR AND CONTROLLER

UNIT 2 SERVICE TANK

UNIT 1 SERVICE TANK

TO CHLORINATION

TO STACK

AIR FOAM CONCENTRATE TANK 3m³

AIR FOAM PROPORTIONING CONTROLLER (1×100%)

No. 2 (1500KL)

RAW WATER TANKS

No. 1 (1500KL)

SPARE

SPARE

SAMPLING

SAMPLING

SERVICE WATER PUMPUS 2×100%

EMERGENCY FRESH WATER FIRE PUMP MOTOR AND DIESEL ENGINE DRIVEN 1×100%

TO WATER TREATMENT

WEARHOUSE

WEARHOUSE HYDRANTS

AH

TO UNIT 2 BOILER AREA HYDRANTS

ADMINISTRATION BUILDING

ADM. BUILDING HYDRANTS

COOLING WATER BACK UP

TURBINE OIL COOLER BACK UP

COOLING WATER HAED TANK

TO UNIT 2 MAIN POWER HOUSE HYDRANTS

TURBINE OIL COOLER BACK UP

COOLING WATER HAED TANK

TO UNIT 1 MAIN POWER HOUSE HYDRANTS

AH

TO UNIT 1 BOILER AREA HYDRANTS

TRANSFER PUMP HOUSE

UNIT 2 MAIN TRANSFORMER

UNIT 2 AUX. TRANSFORMER

STARTING TRANSFORMER

UNIT 1 AUX. TRANSFORMER

UNIT 1 MAIN TRANSFORMER

No. 1 HEAVY OIL STORAGE TANK

No. 2 HEAVY OIL STORAGE TANK

LOTH-A LOTI

11KV GRID STATION TRANSFORMER

No. 2

No. 1

SUBSTATION

INTERCHANGE TRANSFORMER

No. 2

No. 1

REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

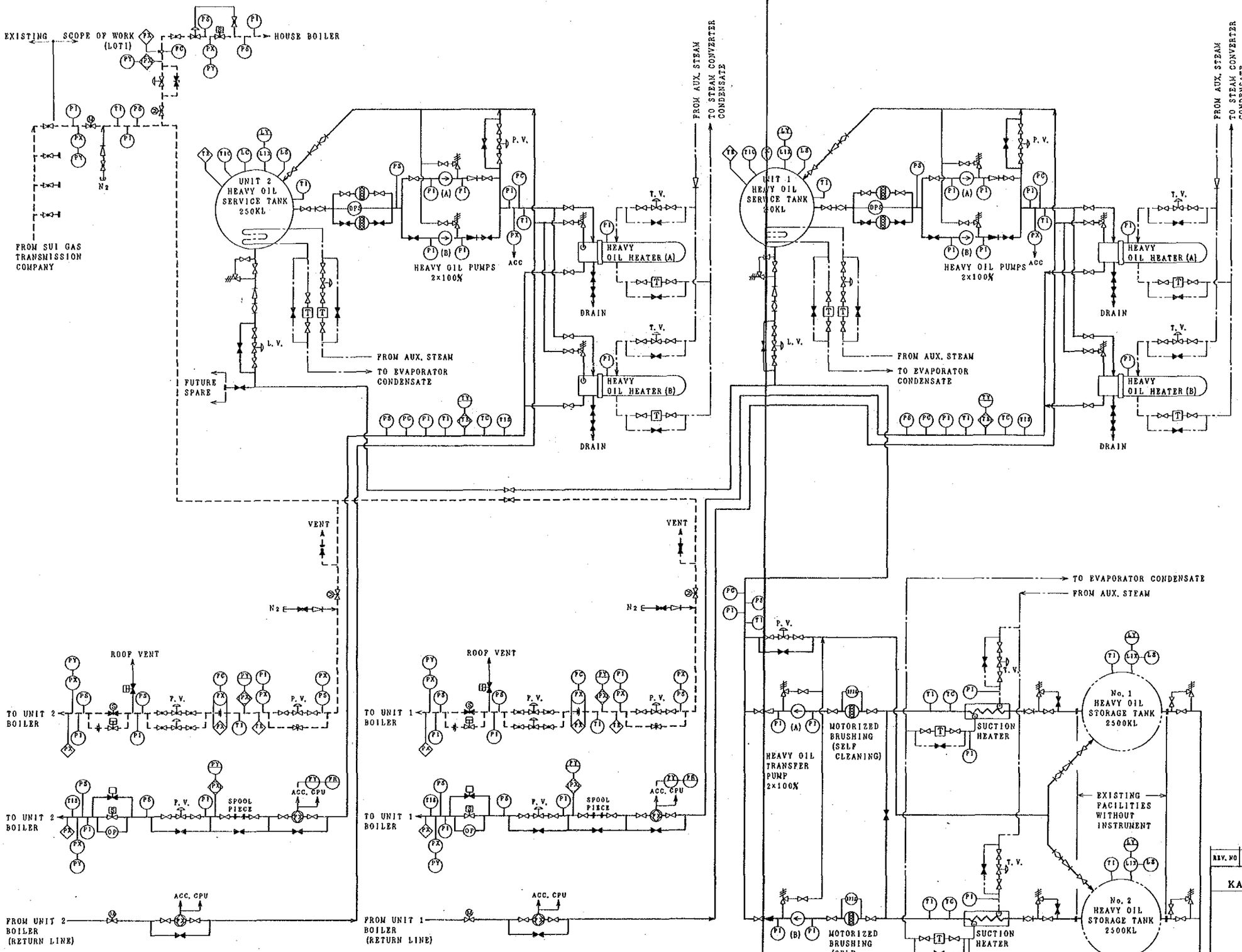
PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2

STANDARD FLOW DIAGRAM
FIRE WATER SYSTEM

JAPAN INTERNATIONAL COOPERATION AGENCY

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Okiwa	S. Fujimoto	M. Iwahara	Takeuchi
DWG NO.	SCALE	DATE	
WMT-1005	NONE	10TH JAN 1990	



LEGEND

SYMBOLS	DESCRIPTION
	RESIDUAL OIL
	NATURAL GAS
	STEAM
	GATE VALVE
	GLOBE VALVE
	CHECK VALVE
F.V.	FLOW CONTROL VALVE
P.V.	PRESSURE CONTROL VALVE
T.V.	TEMPERATURE CONTROL VALVE
	MOTOR VALVE
	MAIN SHUTDOWN VALVE
	SOLENOID VALVE
	CHARGE VALVE
SDV.	SHUT OFF VALVE
	RELIEF VALVE
	PUMP
	STRAINER(WITH DRAIN & VENT VALVES)
	PLATE ORIFICE
	NEEDLE VALVE
	EXPANSION JOINT
T	TRAP
FX	FLOW TRANSMITTER
	INSTRUMENT FOR LOCAL INDICATOR AND CONTROLLER
	INSTRUMENT FOR REMOTE INDICATOR AND RECORDER
	INSTRUMENT FOR COMPUTER
	INSTRUMENT FOR COMPUTER AND OTHER INSTRUMENTS
	EXISTING FLANG PLAT

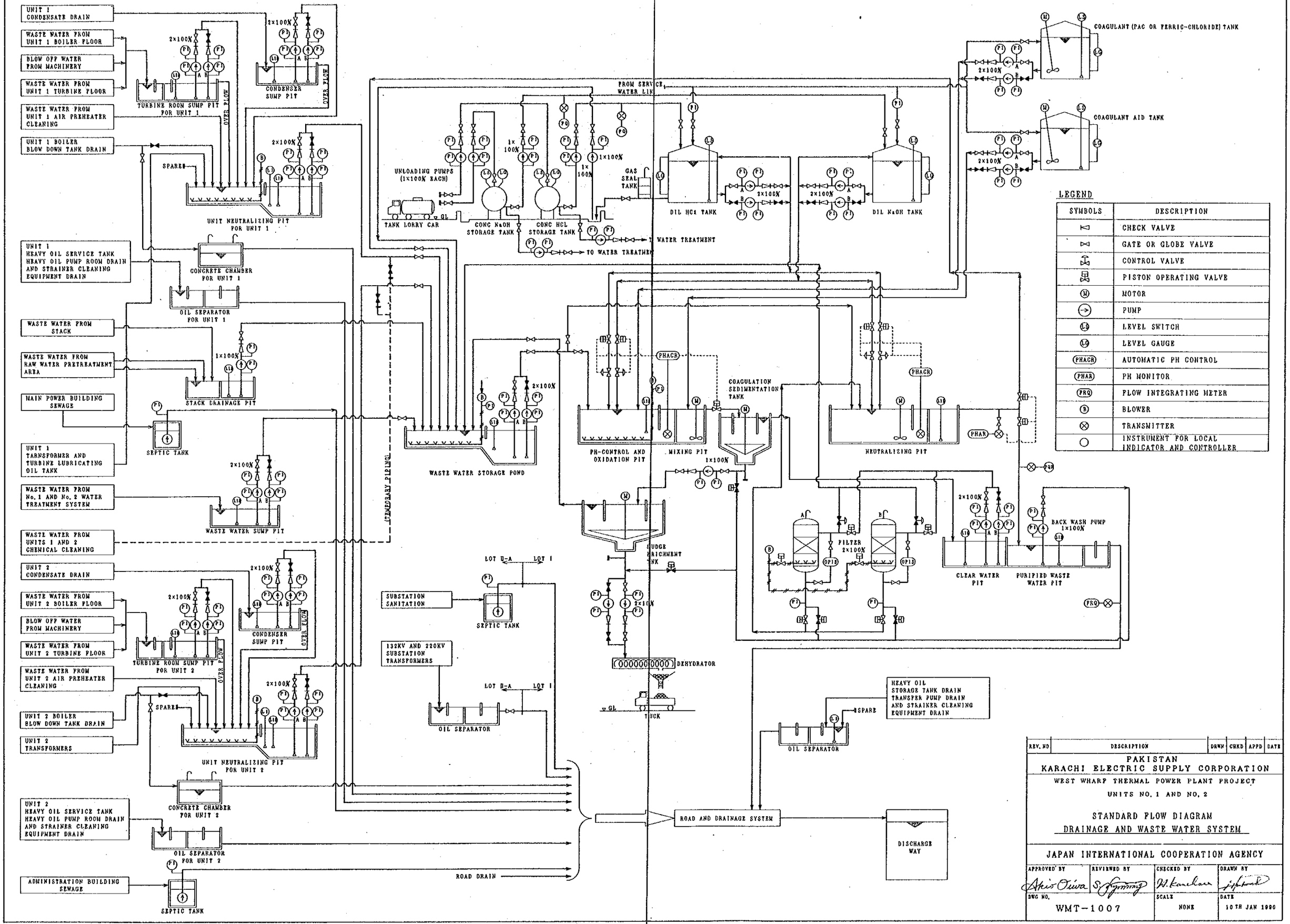
REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

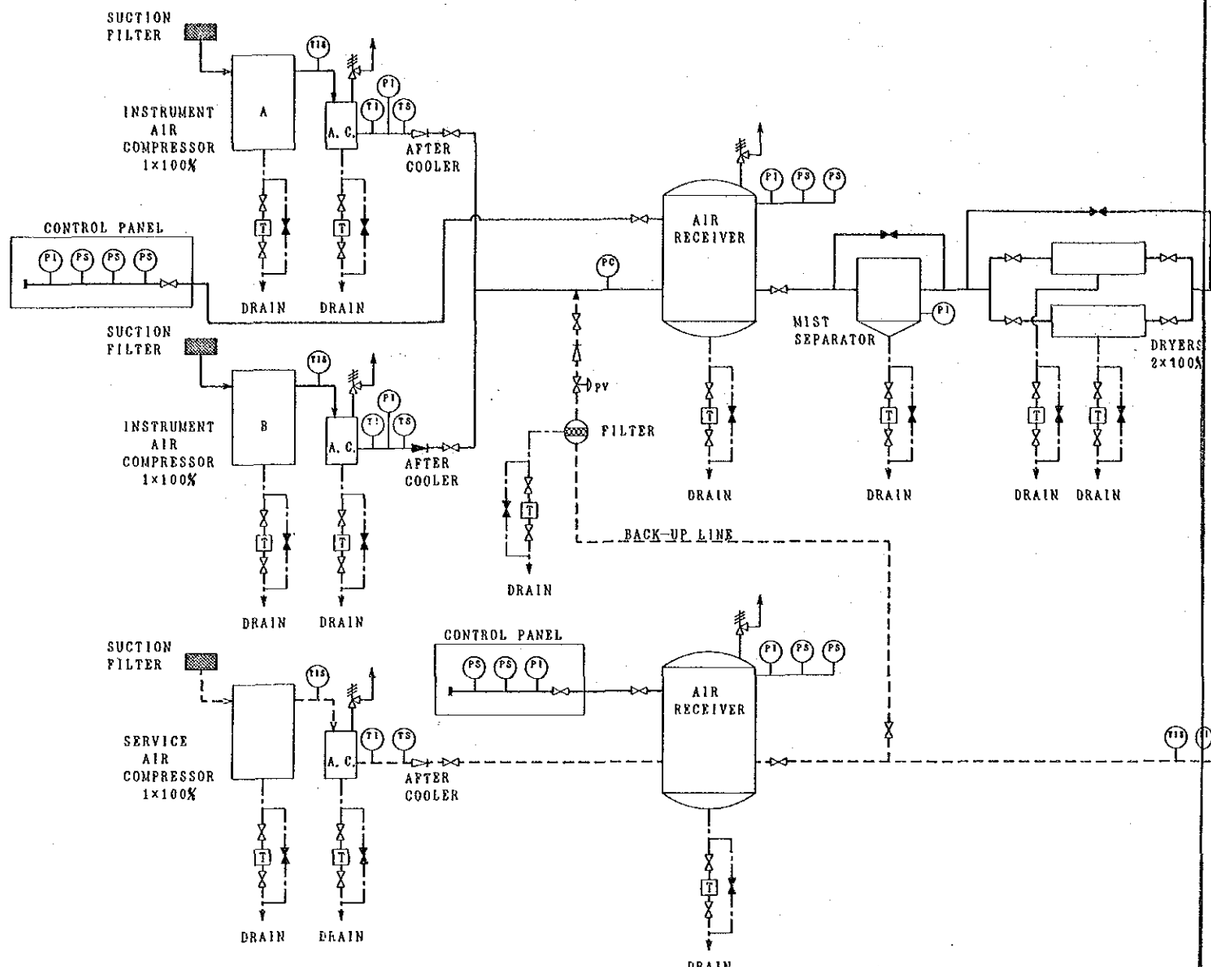
PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2

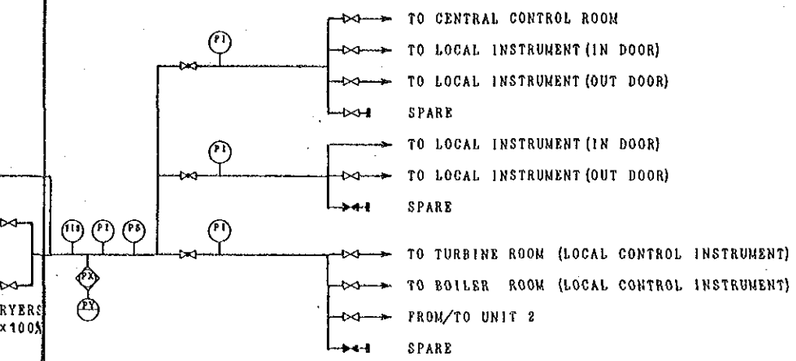
STANDARD FLOW DIAGRAM FUEL OIL SYSTEM

JAPAN INTERNATIONAL COOPERATION AGENCY

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa		H. Kanehara	
DWG NO.		SCALE	DATE
WMT-1006		NONE	10TH JAN 1980

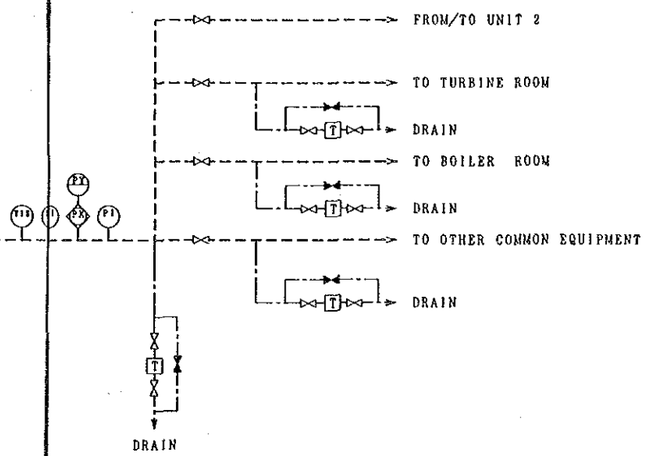

UNIT 1 CONDENSATE DRAIN
WASTE WATER FROM UNIT 1 BOILER FLOOR
BLOW OFF WATER FROM MACHINERY
WASTE WATER FROM UNIT 1 TURBINE FLOOR
WASTE WATER FROM UNIT 1 AIR PREHEATER CLEANING
UNIT 1 BOILER BLOW DOWN TANK DRAIN
TURBINE ROOM SUMP PIT FOR UNIT 1
CONDENSER SUMP PIT
OVER FLOW
SPARE
UNIT NEUTRALIZING PIT FOR UNIT 1
UNIT 1 HEAVY OIL SERVICE TANK HEAVY OIL PUMP ROOM DRAIN AND STRAINER CLEANING EQUIPMENT DRAIN
CONCRETE CHAMBER FOR UNIT 1
OIL SEPARATOR FOR UNIT 1
WASTE WATER FROM STACK
WASTE WATER FROM RAW WATER PRETREATMENT AREA
STACK DRAINAGE PIT
MAIN POWER BUILDING SEWAGE
SEPTIC TANK
UNIT 1 TARNSFORMER AND TURBINE LUBRICATING OIL TANK
WASTE WATER FROM No. 1 AND No. 2 WATER TREATMENT SYSTEM
WASTE WATER SUMP PIT
WASTE WATER FROM UNITS 1 AND 2 CHEMICAL CLEANING
TEMPORARY PIPING
WASTE WATER STORAGE POND
UNLOADING PUMPS (1x100% EACH)
TANK LORRY CAR
CONC NaOH STORAGE TANK
CONC HCL STORAGE TANK
FROM SERVICE WATER LINE
GAS SEAL TANK
TO WATER TREATMENT
DIL HCl TANK
DIL NaOH TANK
COAGULANT (PAC OR FERRIC-CHLORIDE) TANK
COAGULANT AID TANK
PH-CONTROL AND OXIDATION PIT
MIXING PIT
COAGULATION SEDIMENTATION TANK
NEUTRALIZING PIT
SLUDGE THICKENMENT TANK
FILTER 2x100%
BACK WASH PUMP 1x100%
CLEAR WATER PIT
PURIFIED WASTE WATER PIT
DEHYDRATOR
TRUCK
UNIT 2 CONDENSATE DRAIN
WASTE WATER FROM UNIT 2 BOILER FLOOR
BLOW OFF WATER FROM MACHINERY
WASTE WATER FROM UNIT 2 TURBINE FLOOR
TURBINE ROOM SUMP PIT FOR UNIT 2
CONDENSER SUMP PIT
WASTE WATER FROM UNIT 2 AIR PREHEATER CLEANING
UNIT 2 BOILER BLOW DOWN TANK DRAIN
UNIT 2 TRANSFORMERS
UNIT NEUTRALIZING PIT FOR UNIT 2
CONCRETE CHAMBER FOR UNIT 2
UNIT 2 HEAVY OIL SERVICE TANK HEAVY OIL PUMP ROOM DRAIN AND STRAINER CLEANING EQUIPMENT DRAIN
OIL SEPARATOR FOR UNIT 2
ADMINISTRATION BUILDING SEWAGE
SEPTIC TANK
SUBSTATION SANITATION
132KV AND 220KV SUBSTATION TRANSFORMERS
OIL SEPARATOR
HEAVY OIL STORAGE TANK DRAIN TRANSFER PUMP DRAIN AND STRAINER CLEANING EQUIPMENT DRAIN
OIL SEPARATOR
ROAD DRAIN
ROAD AND DRAINAGE SYSTEM
DISCHARGE WAY
LEGEND
SYMBOLS
DESCRIPTION
CHECK VALVE
GATE OR GLOBE VALVE
CONTROL VALVE
PISTON OPERATING VALVE
MOTOR
PUMP
LEVEL SWITCH
LEVEL GAUGE
AUTOMATIC PH CONTROL
PH MONITOR
FLOW INTEGRATING METER
BLOWER
TRANSMITTER
INSTRUMENT FOR LOCAL INDICATOR AND CONTROLLER
REV. NO
DESCRIPTION
DRWN
CHKD
APPD
DATE
PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2
STANDARD FLOW DIAGRAM
DRAINAGE AND WASTE WATER SYSTEM
JAPAN INTERNATIONAL COOPERATION AGENCY
APPROVED BY
REVIEWED BY
CHECKED BY
DRAWN BY
DWG NO.
WMT-1007
SCALE
NONE
DATE
10 TH JAN 1990



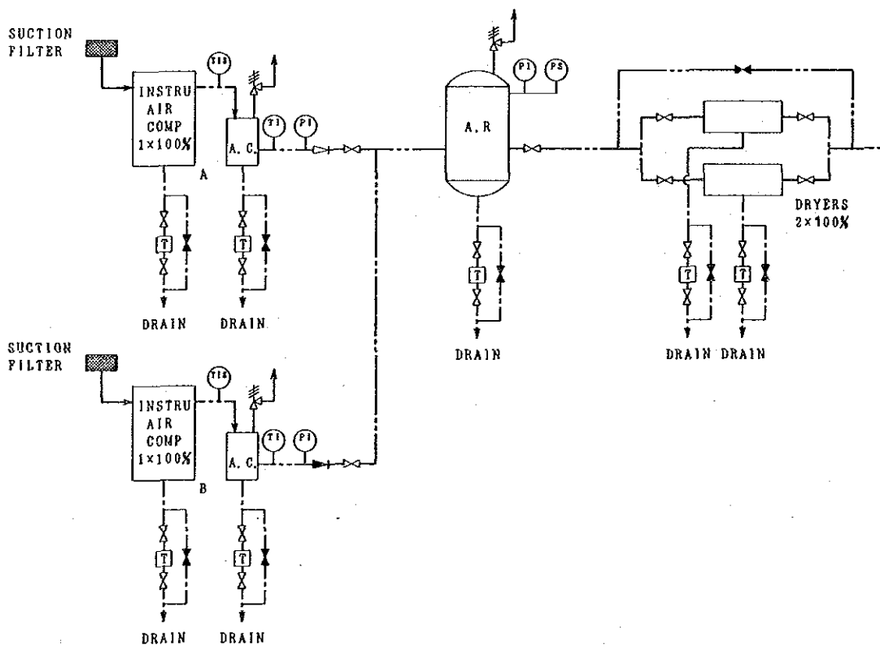


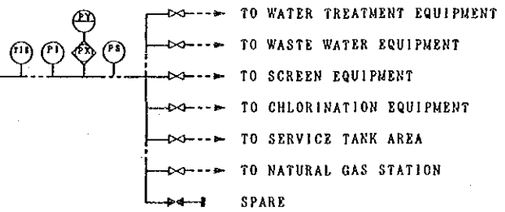
LEGEND

SYMBOLS	DESCRIPTION
———	INSTRUMENT AIR
- - - - -	SERVICE AIR
—·—·—	YARD INSTRUMENT AIR
——·——·——	DRAIN
⋈	CHECK VALVE
⋈	GATE VALVE
⋈	GLOBE VALVE
PV	PRESSURE CONTROL VALVE
	RELIEF VALVE
T	DRAIN TRAP
○	INSTRUMENT FOR LOCAL INDICATOR AND CONTROLLER
◇	INSTRUMENT FOR COMPUTER AND OTHER INSTRUMENTS



YARD INSTRUMENT AIR SYSTEM





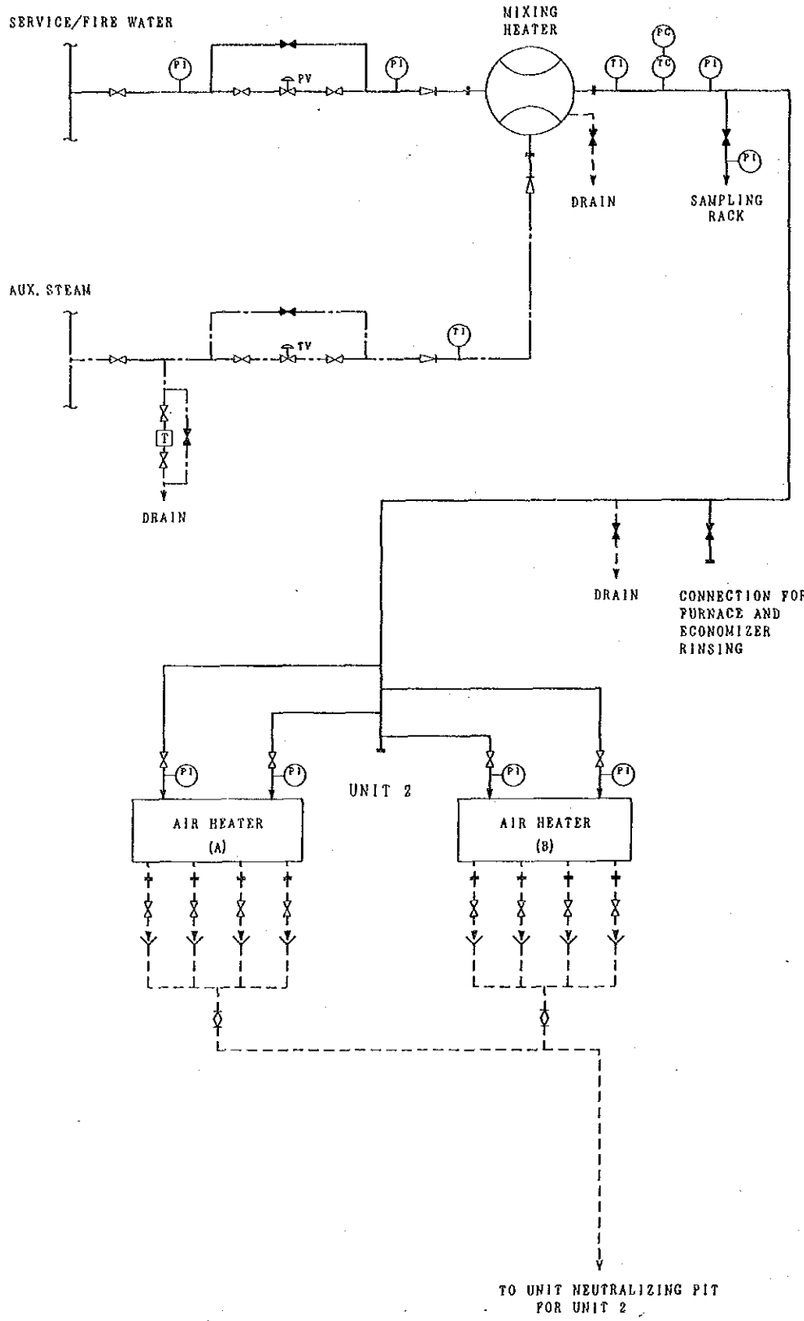
REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

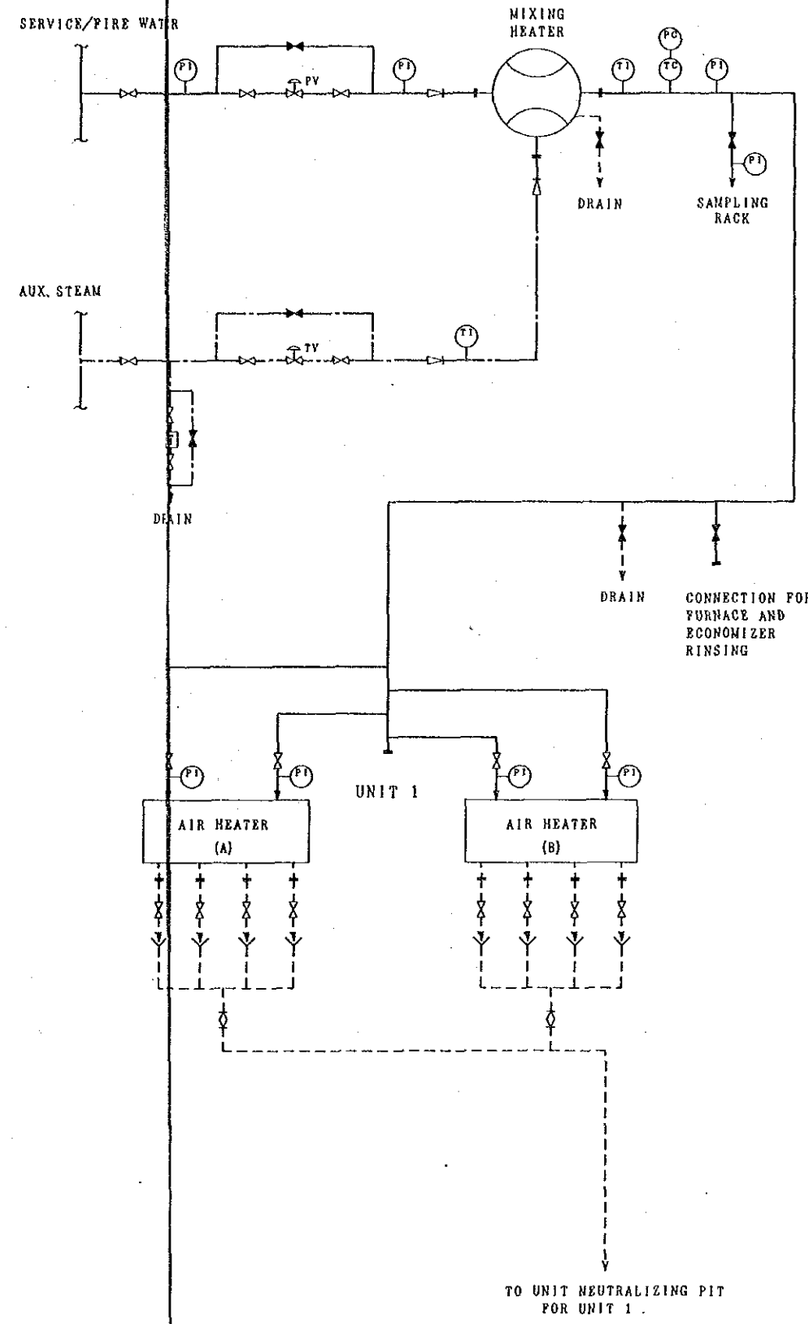
PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2

STANDARD FLOW DIAGRAM
INSTRUMENT AND SERVICE AIR SYSTEM

JAPAN INTERNATIONAL COOPERATION AGENCY

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa		H.Konishi	
DWG NO. WMT-1008		SCALE NONE	DATE 16TH JAN 1990





LEGEND

SYMBOLS	DESCRIPTION
———	WATER
——·—·—·—	STEAM
- - - - - -	DRAIN
⋈	CHECK VALVE
⋈	GATE OR GLOBE VALVE
PV	PRESSURE CONTROL VALVE
⋈	EXPANSION JOINT
T	DRAIN TRAP
○	INSTRUMENT FOR LOCAL INDICATOR AND CONTROLLER

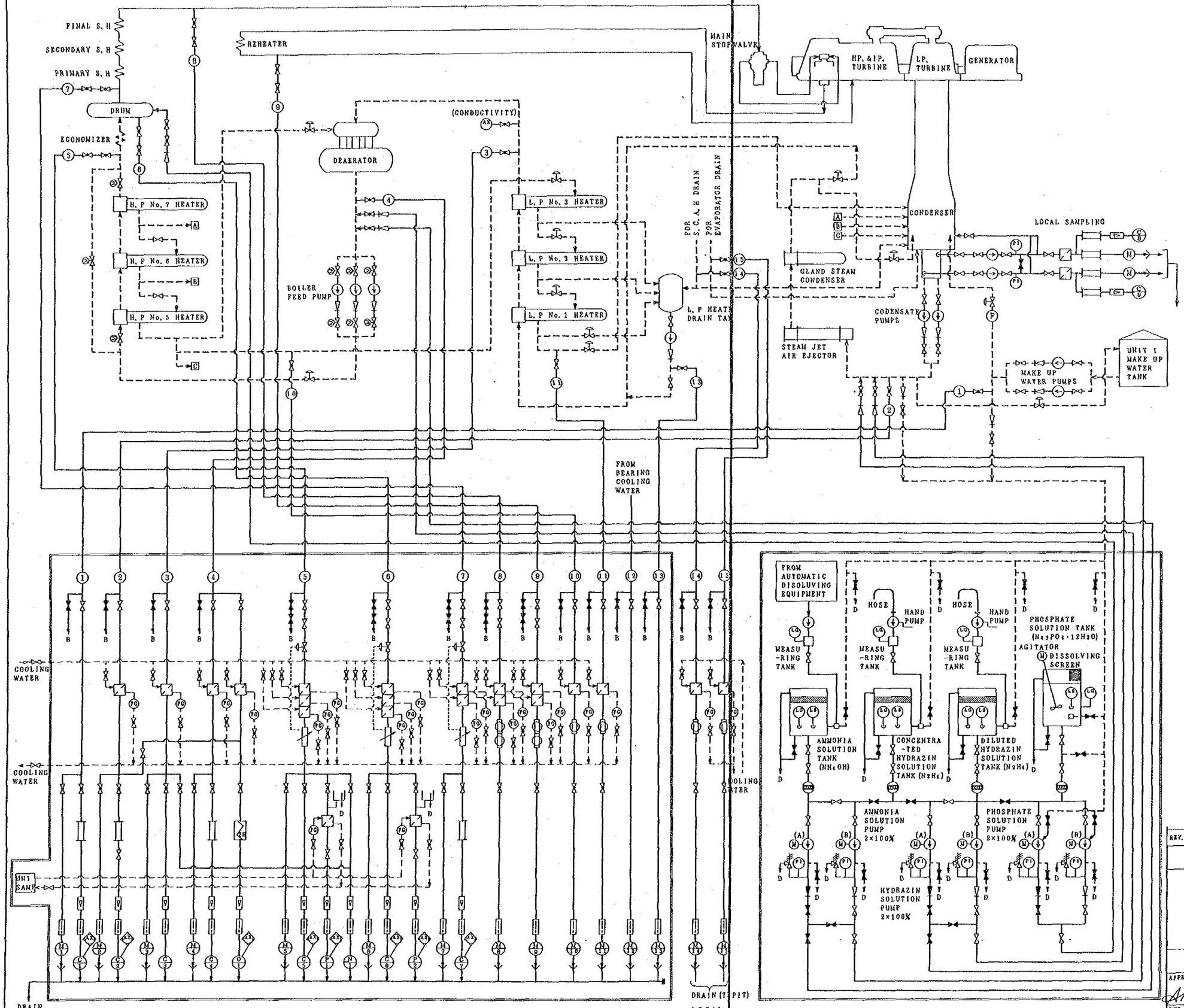
REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2

STANDARD FLOW DIAGRAM
WASHING WATER SYSTEM

JAPAN INTERNATIONAL COOPERATION AGENCY

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Ōiwa	S. Fujimura	M. Kanehara	
DWG NO.		SCALE	DATE
WMT-1009		NONE	10TH JAN 1980



LEGEND

SYMBOLS	DESCRIPTION
———	SAMPLING AND CHEMICAL FEED
- - - - -	FEEDWATER AND MAKE UP WATER
- - - - -	COOLING WATER
———	STEAM
⋈	GATE VALVE
⋈	GLOBE VALVE
⋈	CHECK VALVE
⋈	RELIEF VALVE
⋈	CONTROL VALVE
⋈	MOTOR VALVE
→	PUMP
⋈	STRAINER (WITH DRAIN & VENT VALVES)
M	MOTOR
⋈	HAND REDUCING VALVE
⋈	COOLER
⋈	ION EXCHANGE REGIN VALVE
⋈	AUTOMATIC REDUCING VALVE
SH	SAMPLE HEATER
⋈	HEAD VESSEL
FM	SAMPLE FLOW METER
T	SAMPLE THERMOMETER
FG	SIGHT FLOW GLASS
M	HAND ANALYSIS
N	HYDRAZIN ANALYZER
O	DISSOLVED OXIGEN ANALYZER
P	PH METER
C	CONDUCTIVITY METER
D	DRAIN
B	BLOW
○	INSTRUMENT FOR LOCAL INDICATOR AND CONTROLLER
◇	INSTRUMENT FOR COMPUTER AND OTHER INSTRUMENTS

NOTES

1. ALL DRAIN PIPING SHALL BE JOINED TO THE DRAINAEG PIPE OF THE UNIT NEUTRALIZING PIT INLET LINE.
2. VALVES RELATED TO THE INSTRUMENTS SHALL BE SUPPLIED.

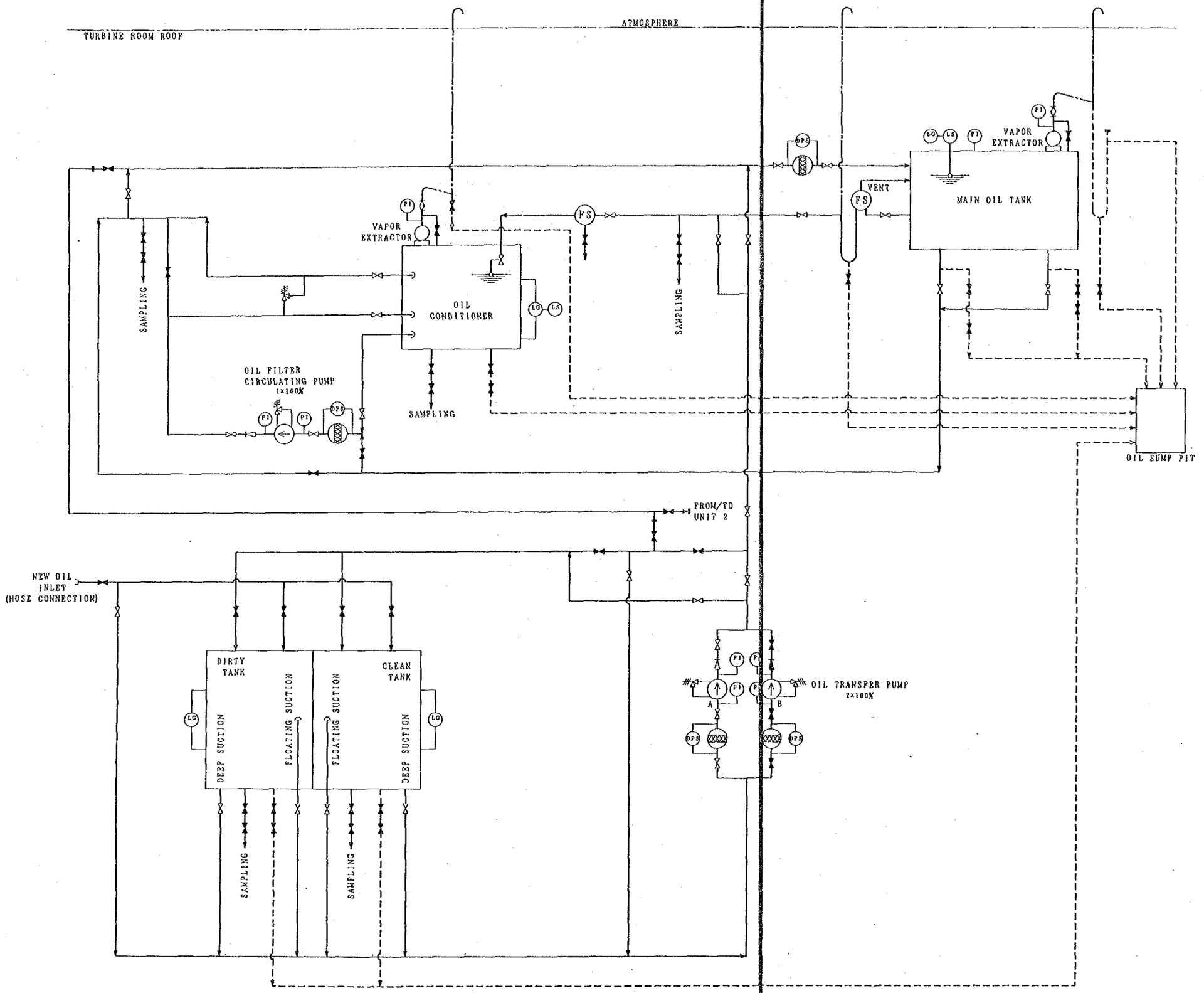
REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2

STANDARD FLOW DIAGRAM
CHEMICAL FEED AND SAMPLING RACK SYSTEM

JAPAN INTERNATIONAL COOPERATION AGENCY

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa	S. Fujimura	H. Kanehara	
DWG NO. WMT-1010	SCALE NONE	DATE 10TH JAN 1980	



LEGEND

SYMBOLS	DESCRIPTION
	LUBRICATING OIL
	DRAIN
	VENT
	GATE OR GLOBE VALVE
	CHECK VALVE
	RELIEF VALVE
	FLOAT VALVE
	EXPANSION JOINT
	STRAINER
FS	FLOW SIGHT GLASS
	HOSE CONNECTION
	PUMP
	INSTRUMENT FOR LOCAL INDICATOR AND CONTROLLER
	INSTRUMENT FOR REMOTE INDICATOR AND RECORDER

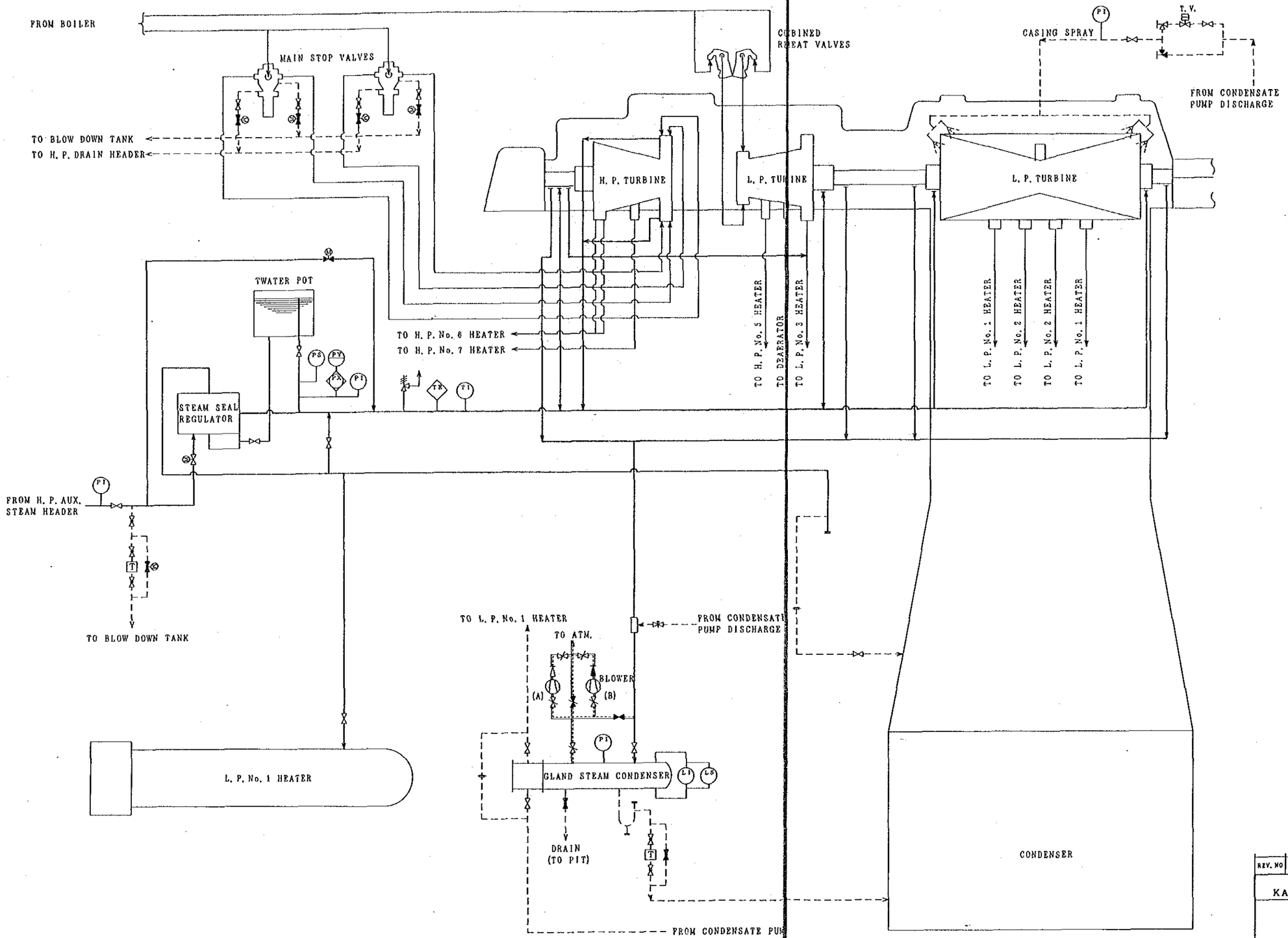
REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2

STANDARD FLOW DIAGRAM
TURBINE LUBRICATING OIL SYSTEM

JAPAN INTERNATIONAL COOPERATION AGENCY

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa		H. Kashima	
DWG NO.		SCALE	DATE
WMT-1011		NONE	10 TH JAN 1990



LEGEND

SYMBOLS	DESCRIPTION
	GLAND SEAL STEAM
	MAIN AND EXTRATION STEAM
	DRAIN AND WATER
	AIR
	GATE VALVE
	GLOBE VALVE
	NEEDLE VALVE
	CHECK VALVE
	BUTTERFLY VALVE
	RELIEF VALVE
	MOTOR VALVE
T. V.	SHUT OFF VALVE
	ANGLE VALVE
T	TRAP
	PLATE ORIFICE
	INSTRUMENT FOR LOCAL INDICATOR AND CONTROLLER
	INSTRUMENT FOR REMOTE INDICATOR AND RECORDER
	INSTRUMENT FOR COMPUTER
	INSTRUMENT FOR COMPUTER AND OTHER INSTRUMENTS

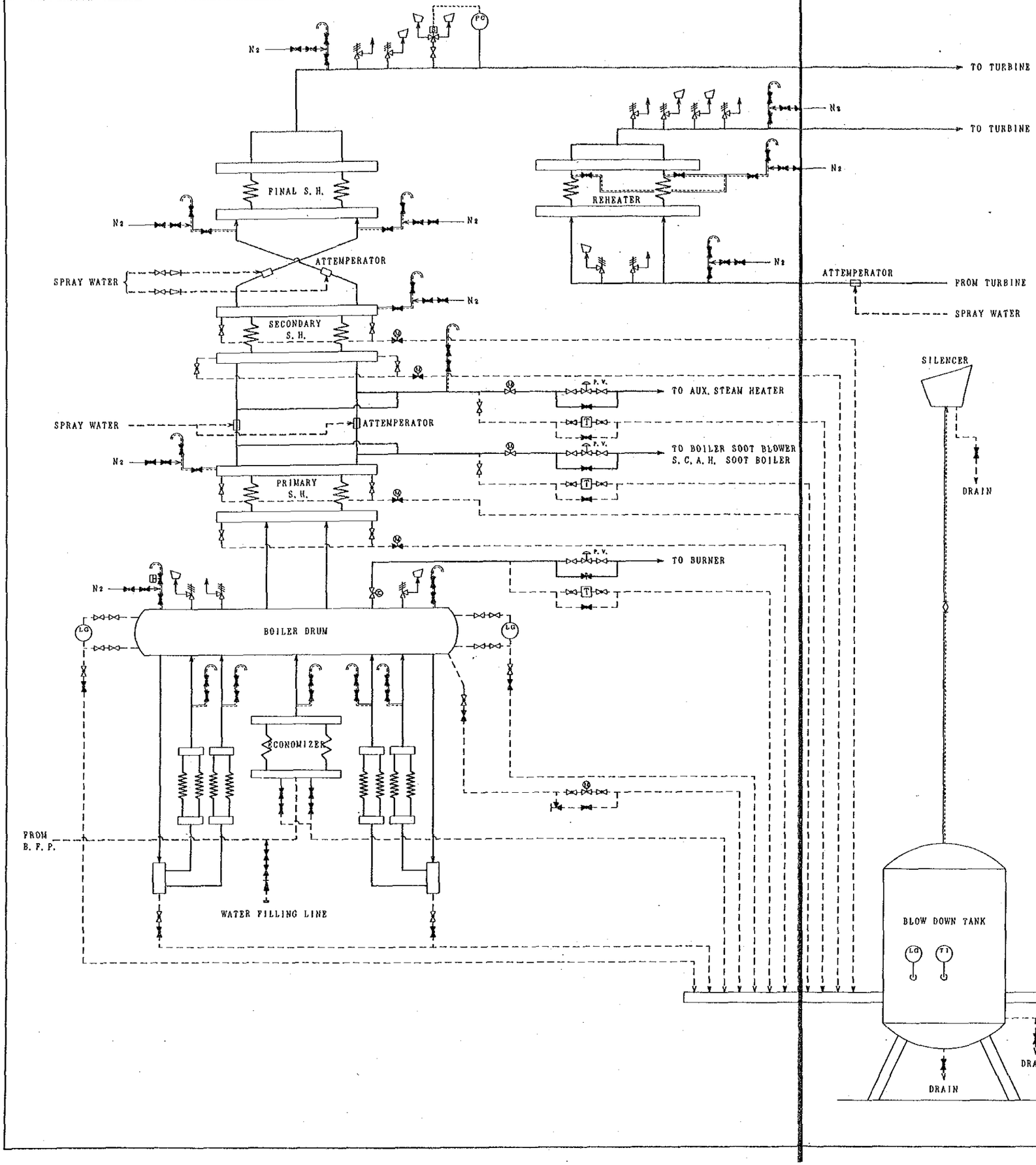
REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2

FLOW DIAGRAM
TURBINE GLAND STEAM SEAL SYSTEMM

JAPAN INTERNATIONAL COOPERATION AGENCY

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akira Oiwa		H. Tanikawa	
DWG NO. WMT-1012		SCALE NONE	DATE 10TH JAN 1990



LEGEND

SYMBOLS	DISCRIPTION
———	STEAM
- - - - - -	FEED WATER
----------	AIR VENT
- - - - - -	DRAIN
⋈	GATE VALVE
⋈	GLOBE VALVE
P. V.	PRESS. CONTROL VALVE
⋈	NEEDLE VALVE
M	MOTOR VALVE
	RELIEF VALVE
S	THREE WAY VALVE (SLENOID)
	CHECK VALVE
	ANGLE VALVE
	EXPANSION JOINT
	SILENCER
◯	INSTRUMENT FOR LOCAL INDICATOR AND CONTROLLER

DRAIN LINE IDENTIFICATION

No	NAME OF DRAIN LINE
1	H. P. AUX. STEAM HEADER DRAIN
2	L. P. AUX. STEAM HEADER DRAIN
3	AUX. STEAM PIPE DRAIN
4	SOOT BLOWING STEAM PIPE DRAIN
5	DITTO
6	BURNER ATOMIZING STEAM PIPE DRAIN
7	MAIN STEAM PIPE DRAIN
8	MAIN STOP VALVE SEAT DRAIN
9	DEAERATOR DRAIN
10	HEATER DRAIN (H. P. - 6)
11	DITTO (H. P. -7)
12	DITTO (H. P. -8)
13	S. S. R. DRAIN

REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2

FLOW DIAGRAM
BOILER DRAIN AND VENT SYSTEM

JAPAN INTERNATIONAL COOPERATION AGENCY

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akira Okawa		M. Kanehara	
DWG NO. WMT-1013		SCALE NONE	DATE 10TH JAN 1990

LEGEND

SYMBOLS	DESCRIPTION
———	AIR (COMBUSITION AIR)
- - - - - -	FLUE GAS
⊘	DAMPER
⊗	VANE
⊘	DAMPER (FOR REVERSE CURRENT)
M	MOTOR OPERATE
A	AIR OPERATE
○	INSTRUMENT FOR LOCAL INDICATOR AND CONTROLLER
⊖	INSTRUMENT FOR REMOTE INDICATOR AND RECORDER
◇	INSTRUMENT FOR COMPUTER
◈	INSTRUMENT FOR COMPUTER AND OTHER INSTRUMENTS

SEAL AIR
GRF
SEAL AIR
BOILER METAL TEMP
PRI. SH. OUT
SEC. SH. OUT
FINAL SH. OUT
RH. OUT
DRUM
FURNACE
SUPER-HEATERS
REHEA-TER
ECO.
A A. H.
B A. H.
S. A. H.
SAH
SEAL AIR BOOSTER BLOWER
TO SEAL AIR SYSTEM
SILENCER
F. D. F.
WIND DIRECTION & VELOCITY
FROM UNIT 2
STACK
(ATM) WITH INSTRUMENT SCREEN BOX
TO FLAME DETECTORS
TO TELEVISION
FLAME DETECTOR AND TELEVISION VIEWING COOLING AIR FAN
A. C. A
A. C. B
D. C. B

REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2

FLOW DIAGRAM
PLUE GAS AND AIR SYSTEM

JAPAN INTERNATIONAL COOPERATION AGENCY

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa		M. Kamakura	M. Fuchi
DWG NO. WMT-1014		SCALE NONE	DATE 10TH JAN 1980

LEGEND

SYMBOLS	DESCRIPTION
———	UNIT 1 CONSTRUCTION
- - - - - - -	UNIT 2 CONSTRUCTION
——·——·——	DRAIN
⋈	GATE, GLOBE OR BUTTERFLY VALVE
⋈	CHECK VALVE
⋈	DIAPHRAM VALVE
(→)	PUMP
(DPS)	DIFERENTIAL PRESSURE SWITCH
○	INSTRUMENT FOR LOCAL INDICATOR AND CONTROLLER
⊩—	BLIND FLANGE

MOTORISED STRAINER
(SELF CLEANING TYPE)

CHLORINATION
CONTROL PANEL

DPIS

PS

ELECTROLYZERS 3×100%
(GENERATOR 1~16CELL)

1 2 16

OILIMMERSED
POWER SUPPLY

PI

CHLORINATION
FEED PUMPS
3×100%

(A) (B) (C)

CHLORINATION
FEED PUMP PIT

DEARATION COLMNS
BLOWER 3×100%

LS LC LX LG

VENT

INJECTION
PUMPS
3×100%

SAMPLING DRAIN

UINT 2 INJECTION POINT
(INFRONT OF BAR SCREEN)

UINT 1 INJECTION POINT
(INFRONT OF BAR SCREEN)

DRAIN

REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2
STANDARD FLOW DIAGRAM
CHLORINATION SYSTEM
(SEAWATER ELECTROLSYS METHOD)

JAPAN INTERNATIONAL COOPERATION AGENCY

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa	S. Fujimura	M. Kanehara	
DWG NO. WMT-1015		SCALE NONE	DATE 10TH JAN 1990