

LINE SYMBOLS

SYMBOLS	NAME
	PIPE LINE
	CAPILLARY TUBING
	ELECTRIC SIGNAL
	SOFTWARE LINK
	PRESSURE LEAD
	DUCT

PIPING VALVE SYMBOLS

SYMBOLS		NAME
		GATE VALVE (NOR.CLOSED)
		GLOBE VALVE (NOR.CLOSED)
		BALL VALVE (NOR.CLOSED)
		BUTTERFLY VALVE (NOR.CLOSED)
		DIAPHRAGM VALVE (NOR.CLOSED)
		PINCH VALVE (NOR.CLOSED)
		NEEDLE VALVE (NOR.CLOSED)
		CHECK VALVE
		CHECK VALVE (WAFER)
		PRESSURE RELIEF VALVE

INSTRUMENT VALVE SYMBOLS

ACTUATOR VALVE SYMBOLS	
SYMBOLS	NAME
	ACTUATED BY AIR
	ACTUATED BY MOTOR
	AIR CONTROL VALVE
	SOLENOID ACTUATOR
	SELF REGULATING VALVE
	SELF REGULATING VALVE

TRENCH SYMBOLS

SYMBOLS	NAME
 A	TO ABSORBER AREA DRAIN SUMP
 B	TO GYPSUM AREA DRAIN SUMP
 L	TO LIMESTONE AREA DRAIN SUMP

SYMBOLS FOR PIPING PARTS
& INSTRUMENT PARTS

SYMBOLS	NAME
	STEAM TRAP
	AIR TRAP
	Y-STRAINER
	T-STRAINER
	TEMPORARY STRAINER
	REDUCER
	EXPANSION JOINT
	DUCT EXPANSION JOINT
	FLEXIBLE HOSE
	SPOOL PIECE
	VENT
	HOSE CONNECTION
	BLIND FLANGE
	REDUCING FLANGE
	CAP (BW)
	CAP (SCR)
	TRENCH
	SIGHT GLASS
	SILENCER
	ORIFICE
	DIAPHRAGM
	MAGNETIC FLOW METER
	VORTEX FLOW METER
	PH METER
	FILTER
	MANHOLE
	INSPECTION HOLE
	PITOT TUBE
	SAMPLING POT
	SAMPLING NOZZLE
	RESTRICTION ORIFICE

SYMBOLS FOR VALVE OPERATION

SYMBOLS	NAME
	FAILURE OPEN (THE VALVE OPENS WHEN AIR OR ELECTRICITY FOR ACTUATOR FAILS.)
	FAILURE CLOSE (THE VALVE CLOSSES WHEN AIR OR ELECTRICITY FOR ACTUATOR FAILS.)

INSULATION SYMBOLS

SYMBOLS	DESCRIPTION
H10	THERMAL INSULATION (100°C & LOWER)
H15	THERMAL INSULATION (101°C ~ 150°C)
H20	THERMAL INSULATION (151°C ~ 200°C)
H25	THERMAL INSULATION (201°C ~ 250°C)
H30	THERMAL INSULATION (251°C ~ 300°C)
H35	THERMAL INSULATION (301°C ~ 350°C)
HF	INSULATION FOR ANTI FREEZING
ET	ELECTRIC TRACE
ST	STEAM TRACE (LOW PRESSURE STEAM)
P10	PERSONAL PROTECTION (100°C & LOWER)
P15	PERSONAL PROTECTION (101°C ~ 150°C)
P20	PERSONAL PROTECTION (151°C ~ 200°C)
P25	PERSONAL PROTECTION (201°C ~ 250°C)
P30	PERSONAL PROTECTION (251°C ~ 300°C)
P35	PERSONAL PROTECTION (350°C ~ 400°C)

DELIVERY LIMITS

SYMBOLS	NAME
	BETWEEN CLIENT AND CONTRACTOR
 XXX	BETWEEN SUB CONTRACTOR AND VENDOR

SYSTEM

NUMBER	NAME
1	FLUE GAS SYSTEM
2	SO ₂ ABSORPTION OXIDATION SYSTEM
3	REHEATING SYSTEM
4	GYPSUM DEWATERING HANDLING SYSTEM
5	LIMESTONE PREPARATION SYSTEM
6	BLANK
7	SUMP SYSTEM
8	UTILITY SYSTEM

FLUID NAME

FLUID SYMBOL	FLUID NAME	FLUID SYMBOL	FLUID NAME
AA	ANTI-FOAM AGENT	WCS	COOLING WATER SUPPLY
AC	COMPRESSED AIR	WCR	COOLING WATER RETURN
AF	FLUIDIZER AIR		
AI	INSTRUMENT AIR	WP	PROCESS WATER
AO	OXIDATION AIR	WR	RAW WATER
AS	SEAL AIR	WW	WASTE WATER
DD	DUCT DRAIN	VG	VACUUM PUMP VENT
FS	FILTRATE SLURRY	VBG	BELT FILTER VENT GAS
GS	GYPSUM SLURRY	LD	LIMESTONE DEDUSTING
LS	LIMESTONE SLURRY	LOL	LUBE OIL (LOW PRESSURE)
		LOH	LUBE OIL (HIGH PRESSURE)

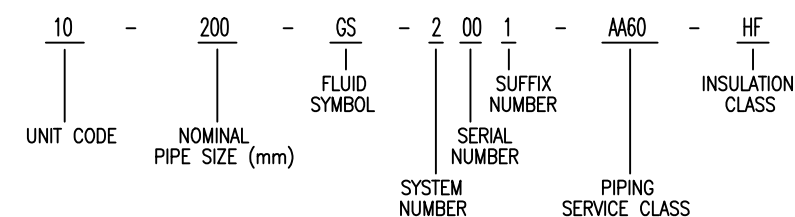
	SERVICE CLASS
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SERVICE CLASS	MATERIAL	FLUID SYMBOL
AA40	IIR RUBBER LINED PIPING	LS, WP, WC
AA60	IIR RUBBER LINED PIPING	GS,FS,WW,DD
BA01	Gr.304 STAINLESS STEEL / GI PIPING	Al, LOL
BA02	Gr.304 STAINLESS STEEL / GI PIPING	LOH
BA03	Gr.316L STAINLESS STEEL PIPING	WP, AO
CA01	CARBON STEEL GENERAL PIPING	AS,AO,AC,AF,LD
CC01	CARBON STEEL PRESSURE PIPING	WP,WR,WCS,WCF, VG, AA

UNIT CODE

UNIT CODE	
SYMBOLS	UNIT IDENTIFICATION
00	COMMON
10	UNIT-1 FGD SYSTEM AND AUXILIARIES

EXPRESSION OF PIPING LINE



CUSTOMER NOS: G201,G202,G203,G204

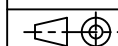
CUSTOMER: NTPC LIMITED.
PROJECT: NABINAGAR (4X250MW)
FGD SYSTEM PACKAGE

 BHARAT HEAVY ELECTRICALS LIMITED, UNIT: BOILER AUXILIARIES PLANT, RANIPET:632 406.	DEPT	NAME (BHEL)	DATE	
	CODE	DRN	KABILASH	17.12.15
	M	CHD	MANOJ KT	17.12.15
	APPD	S K DASH	17.12.15	

MITSUBISHI HITACHI POWER SYSTEMS, LTD.
AIR QUALITY CONTROL SYSTEMS TECHNOLOGY DIVISION

TITLE: P & ID - LEGENDS AND NOTES

SCALE : NTS



NTPC DRG NO: 0270-109-PVM-F-017

SH 01 of 08

BHEL DRG NO	3-FW-000-01067
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FILE NO	B240-00001
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REV NO	00
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INSTRUMENT ABBREVIATION

	FIRST-LETTER		SUCCEEDING-LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		BLANK	BLANK	BLANK
C	BLANK			CONTROL	
D	BLANK	DIFFERENTIAL			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)			
G	BLANK		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	BLANK	MOMENTARY			MIDDLE, INTERMEDIATE
N	BLANK		BLANK	BLANK	BLANK
O	BLANK		ORIFICE, RESTRICTION		
P	PRESSURE, VACUUM		POINT(TE) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

INSTRUMENT SYMBOLS

SYMBOLS	NAME
	FIELD MOUNTED
	FOR CONTROL ROOM
	FOR LOCAL CONTROL PANEL
	FOR DCS
	INTERLOCK LOGIC

PNEUMATIC VALVE ACTUATOR

CODE NO.	ACTUATION
FLXXWA-D	DOUBLE SOLENOID NO LIMIT SWITCH
FLXXWA-DL	DOUBLE SOLENOID WITH LIMIT SWITCH
FLXXWA-S	SINGLE SOLENOID NO LIMIT SWITH
FLXXWA-SL	SINGLE SOLENOID WITH LIMIT SWITCH

MACHINARY SYMBOLS

SYMBOLS	NAME
	PUMP
	FAN / BLOWER
	AGITATOR (FLAT BLADE)
	AGITATOR (PROPELLOR)
	ROTARY VALVE
	CRUSHER
	BELT FEEDER
	BELT FILTER
	BALL MILL
	CYCLONE
	MIST ELIMINATOR

EQUIPMENT SYMBOLS

SYMBOLS	NAME
	BAG FILTER
	SILLO
	SLIDE GATE
	TANDEM LOUVER DAMPER (MULTIVANE)
	SINGLE STAGE LOUVER DAMPER (MULTIVANE)
	LOUVER DAMPER (SINGLE VANE)
	DISTRIBUTION BOX (3WAY)
	DISTRIBUTION BOX (2WAY)
	SUMP
	HEAT EXCHANGER
	SHELL AND TUBE HEAT EXCHANGER
	AIR DRYER
	FILTER
	SPRAY NOZZLE

DRIVER SYMBOLS

SYMBOLS	NAME
	AIR MOTOR
	ELECTRIC MOTOR

OTHER SYMBOLS

SYMBOLS	NAME
	INSERT PIPE / LANCE
	CHUTE
	TRUCK

CUSTOMER NOS: G201,G202,G203,G204

CUSTOMER: NTPC LIMITED.
PROJECT: NABINAGAR (4X250MW)
FGD SYSTEM PACKAGE

DEPT CODE	NAME (BHEL)	DATE
DRN	KABILASH	17.12.19
CHD	MANOJ KT	17.12.19
APPD	S K DASH	17.12.19

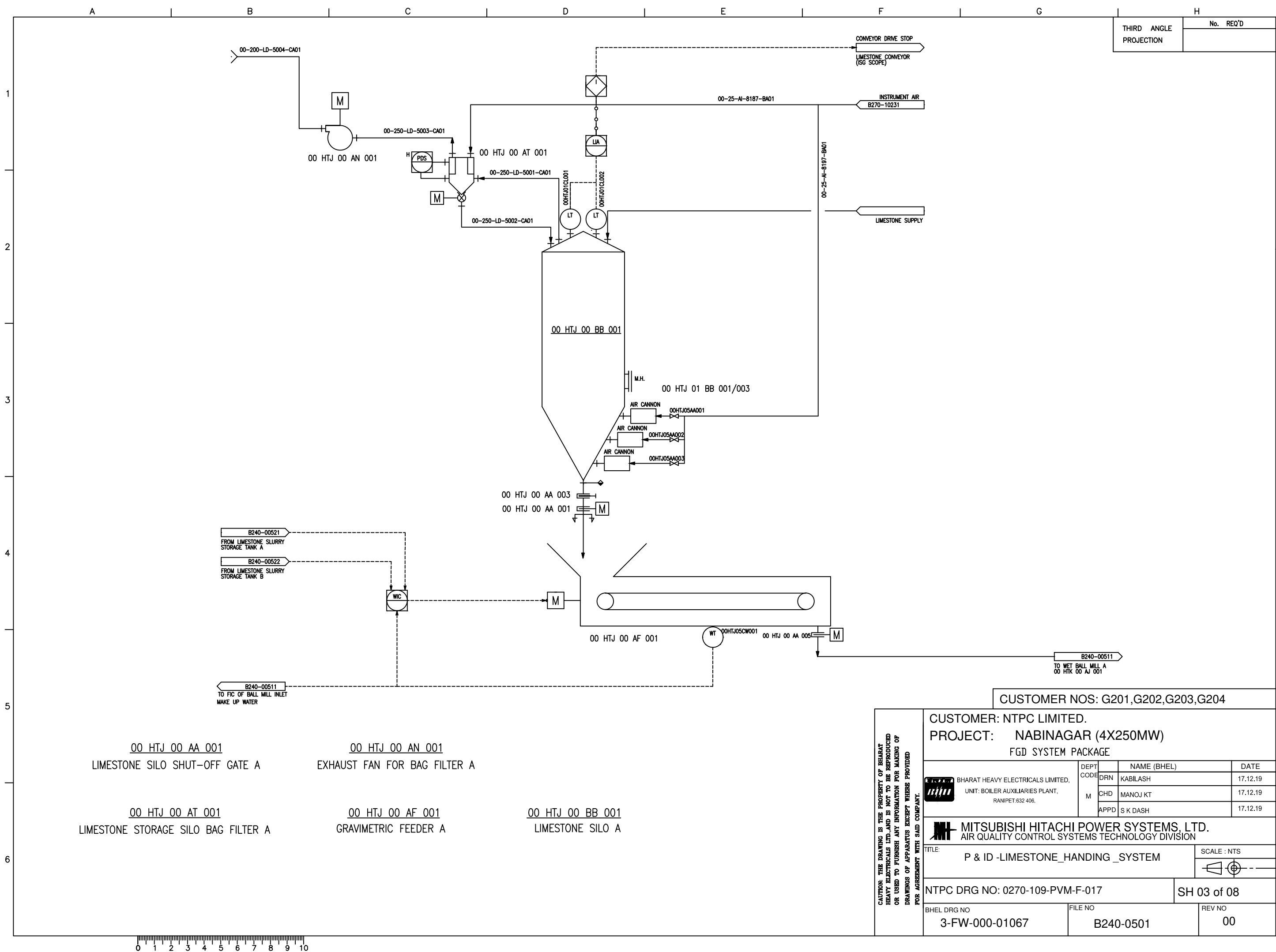
MITSUBISHI HITACHI POWER SYSTEMS, LTD.
AIR QUALITY CONTROL SYSTEMS TECHNOLOGY DIVISION

TITLE:
P & ID - LEGENDS AND NOTES

SCALE : NTS

NTPC DRG NO: 0270-109-PVM-F-017	SH 02 of 08
BHEL DRG NO 3-FW-000-01067	FILE NO B240-00002
REV NO 00	

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THIRD ANGLE
PROJECTION

No.	REQ'D

A3

DRAWING No.

CUSTOMER NOS: G201,G202,G203,G204

CUSTOMER: NTPC LIMITED.
PROJECT: NABINAGAR (4X250MW)
FGD SYSTEM PACKAGE

DEPT CODE	NAME (BHEL)	DATE
DRN	KABILASH	17.12.19
CHD	MANOJ KT	17.12.19
APPD	S K DASH	17.12.19

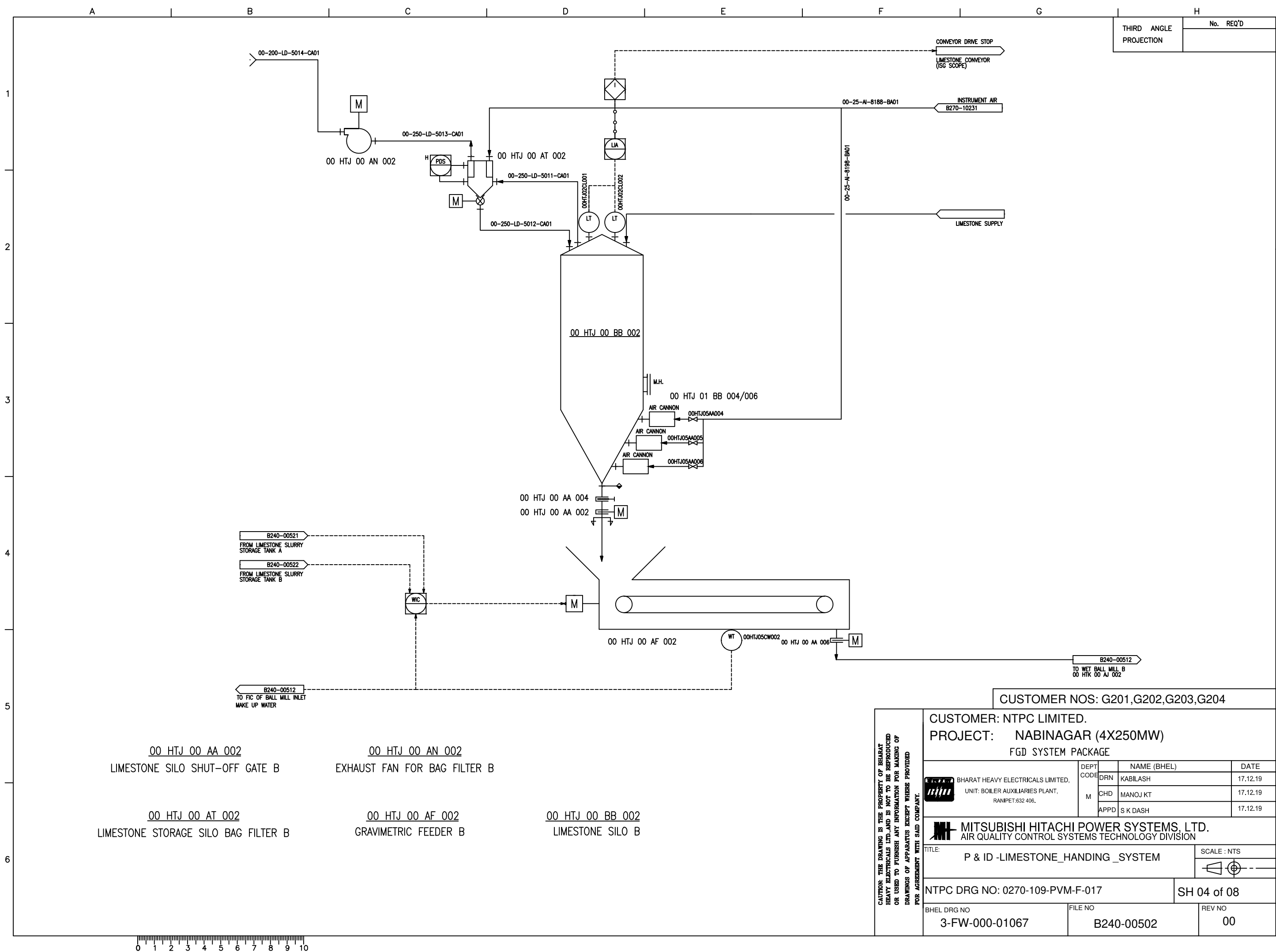
MITSUBISHI HITACHI POWER SYSTEMS, LTD.
AIR QUALITY CONTROL SYSTEMS TECHNOLOGY DIVISION

TITLE: P & ID -LIMESTONE_HANDING_SYSTEM
SCALE : NTS

NTPC DRG NO: 0270-109-PVM-F-017
SH 03 of 08

BHEL DRG NO 3-FW-000-01067	FILE NO B240-0501	REV NO 00
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THIRD ANGLE
PROJECTION

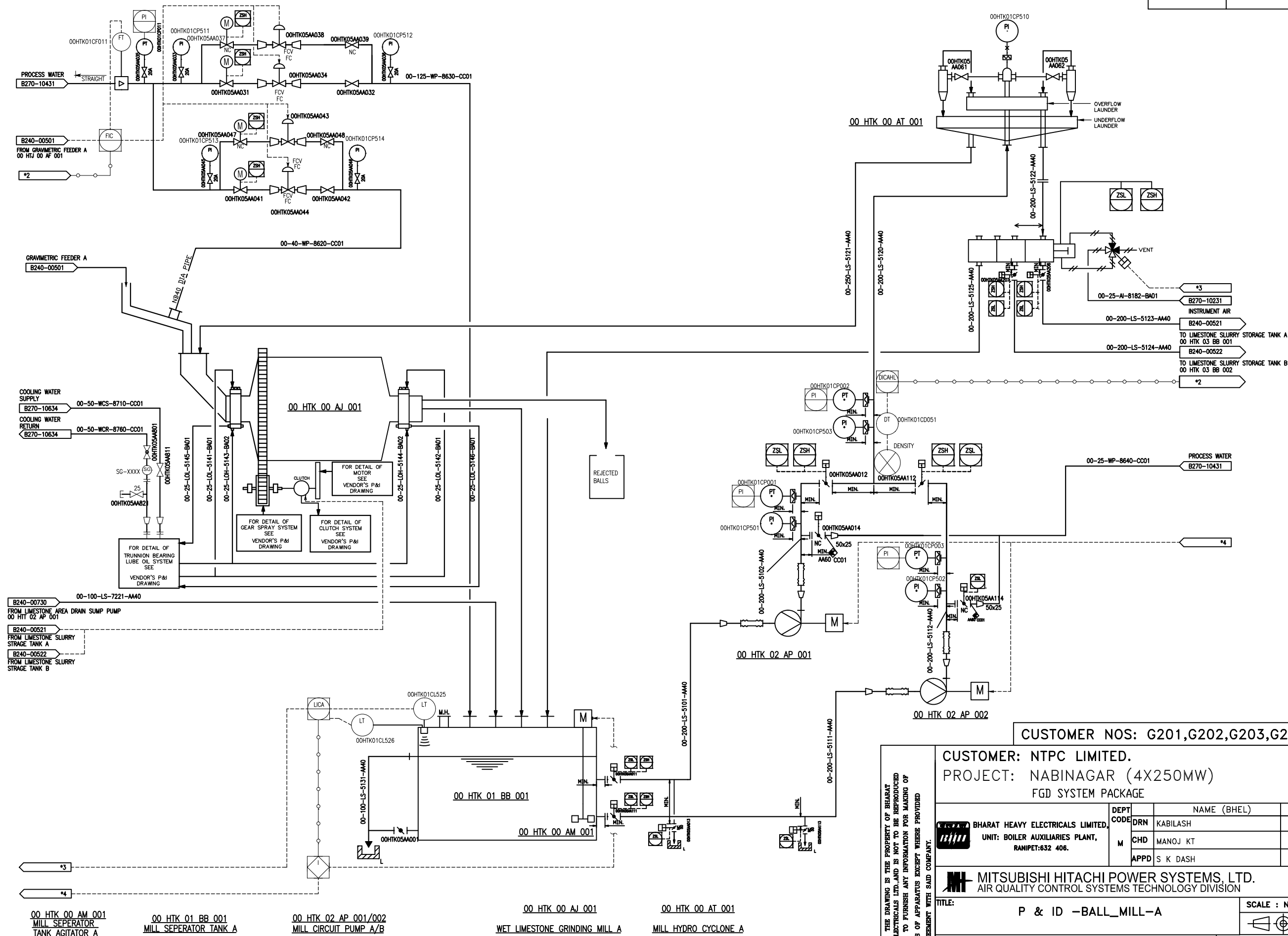
No. REQ'D

A3

DRAWING No.

CUSTOMER NOS: G201,G202,G203,G204

CUSTOMER: NTPC LIMITED.		
PROJECT: NABINAGAR (4X250MW)		
FGD SYSTEM PACKAGE		
DEPT CODE	NAME (BHEL)	DATE
DRN	KABILASH	17.12.19
CHD	MANOJ KT	17.12.19
APPD	S K DASH	17.12.19
MITSUBISHI HITACHI POWER SYSTEMS, LTD.		
AIR QUALITY CONTROL SYSTEMS TECHNOLOGY DIVISION		
TITLE: P & ID -LIMESTONE_HANDING_SYSTEM		SCALE : NTS
NTPC DRG NO: 0270-109-PVM-F-017		SH 04 of 08
BHEL DRG NO	FILE NO	REV NO
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CUSTOMER: NTPC LIMITED.
PROJECT: NABINAGAR (4X250MW)
FGD SYSTEM PACKAGE

BHARAT HEAVY ELECTRICALS LIMITED
UNIT: BOILER AUXILIARIES PLANT,
RANIPET:632 406.

 MITSUBISHI HITACHI POWER SYSTEMS, LTD
AIR QUALITY CONTROL SYSTEMS TECHNOLOGY DIVISION

TITLE:	P & ID -BALL MILL-A
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NTPC DRG NO: 0270-109-PVM-F-017

BHEL DRG NO
3-FW-000-01067

FILE NO	B240-00511
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SCALE : NTS

05 of 08

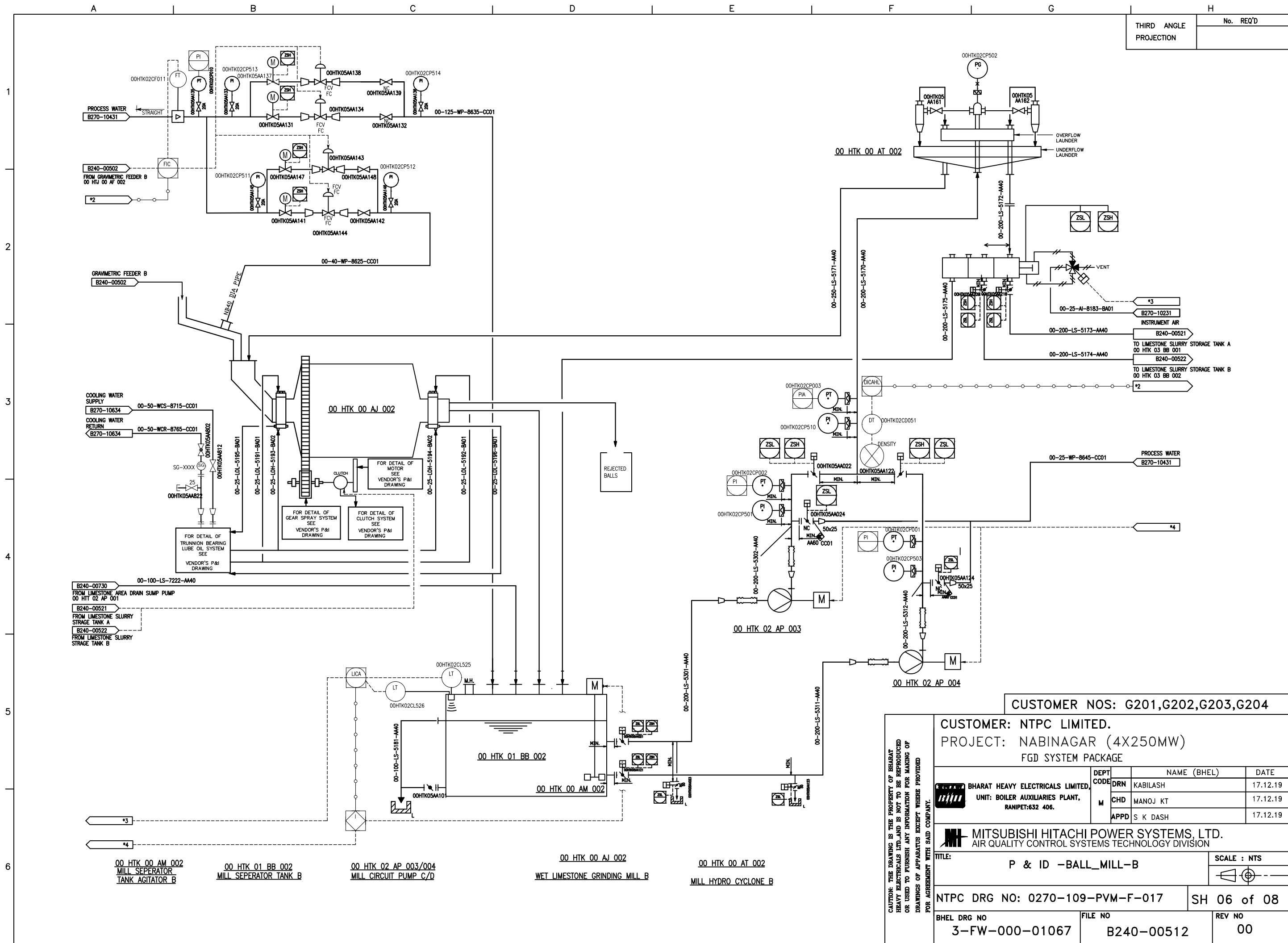
REV NO	00
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THIRD ANGLE
PROJECTION

No. REQ'D

A3

DRAWING No.



CUSTOMER NOS: G201,G202,G203,G204

CUSTOMER: NTPC LIMITED.
PROJECT: NABINAGAR (4X250MW)
FGD SYSTEM PACKAGE

DEPT CODE	NAME (BHEL)	DATE
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APPD	S K DASH	17.12.19

MITSUBISHI HITACHI POWER SYSTEMS, LTD.
AIR QUALITY CONTROL SYSTEMS TECHNOLOGY DIVISION

TITLE: P & ID -BALL_MILL-B

SCALE : NTS

NTPC DRG NO: 0270-109-PVM-F-017

SH 06 of 08

BHEL DRG NO
3-FW-000-01067

FILE NO
B240-00512

REV NO
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