

Inspection Methodology For LSTK/PMC Jobs

PROJECT : ASSAM BIO REFINERY PROJECT

OWNER : ABRPL

PMC : EIL

JOB NO. : B215

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Abbreviations:

CV	:	Curriculum Vitae
EPC	:	Engineering, Procurement & Construction
H	:	Hold
IBR	:	Indian Boiler Regulations
IC	:	Inspection Certificate
IR	:	Inspection Report
IRN	:	Inspection Release Note
ITP	:	Inspection and Test Plan
LSTK	:	Lump Sum Turn Key
P	:	Perform
PESO	:	Petroleum Explosive Safety Organization
PMC	:	Project Management Consultant
PO	:	Purchase Order
PR	:	Purchase Requisition
PS	:	Purchase Specification
QA/QC	:	Quality Assurance / Quality Control
QAP	:	Quality Assurance Plan
QTY	:	Quantity
R	:	Review
RCM	:	Resident Construction Manager
RPO	:	Regional Procurement Office
TPIA	:	Third Party Inspection Agency
W	:	Witness

ANNEXURE:-

Guideline for Item Categorization Plan

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1.0 PURPOSE

The purpose of this document is to detail out the Inspection Methodology & co-ordination procedure to be adopted for ensuring the quality of the materials being supplied and defines the roles of various agencies involved and the quality system to be adhered to.

2.0 SCOPE

This document is applicable for inspection methodology and coordination procedure of all material to be supplied by the EPC/LSTK Contractor in EIL PMC jobs against ABRPL Rajasthan Refinery project.

3.0 REFERENCES

Bid / Contract Document

4.0 DEFINITIONS

4.1 OWNER

Owner shall mean the Project Owner (ABRPL)

4.2 PMC

PMC shall mean Project Management Consultant, namely Engineers India Limited (EIL).

4.3 EPC/LSTK CONTRACTOR

EPC/LSTK Contractor means any party whose scope includes Engineering, Procurement, Construction and Commissioning of the Unit / Facilities / System on Lump Sum basis, covered under the specified scope of work as per the Contract document. Contractor, EPC Contractor and LSTK Contractor are considered synonymous.

4.4 SUPPLIER

Supplier means any party supplying any of the equipment, material, products and services to the EPC/LSTK Contractor. Vendor, Seller, Agent is considered synonymous to Supplier.

4.5 SUB SUPPLIER

Sub supplier means any party on whom supplier suborders materials and items and whose role is defined in ITPs.

4.6 QUALITY ASSURANCE PLAN (QAP) / INSPECTION AND TEST PLAN (ITP)

It is a document generated by the supplier with complete listing of various inspection stages, tests, material certification requirements and parties involved with their respective roles in inspection; indicating the requirements of Hold (H), Witness (W) stages, and Review (R) of Quality control documents / records for an item.

4.6.1 HOLD POINT

A Hold Point is a stage designated in the ITP/QAP, which requires Witness Inspection before supplier can proceed with further processing, except for cases where prior written permission for further processing or waiver of Witness Inspection by concerned agencies is obtained.

4.6.2 WITNESS POINT

A Witness point is a stage designated in the ITP/QAP, which requires Witness Inspection. EPC/LSTK Contractor / Supplier shall perform the activity after proper notification has been given for witnessing the activity. The Contractor/ Supplier is not obliged to hold further processing, unless notified otherwise.

4.6.3 REVIEW POINT

A review point is a stage designated in the ITP/QAP which requires the concerned agencies to verify the documents for their correctness and to confirm that the said documents meet the requirements laid down.

4.7 THIRD PARTY INSPECTION AGENCY (TPIA)

Third Party Inspection Agency means an inspection agency appointed for carrying out Inspection and witness of tests of material being procured by the Contractor for the Project.

4.8 INSPECTION CATEGORY

Inspection category determines the scope of Inspection for the Supplier, TPIA, PMC / OWNER for various materials depending upon criticality as identified in categorization plan.

4.9 REGIONAL PROCUREMENT OFFICE (RPO)

Inspection office of EIL (PMC), located at various locations.

4.10 QUALITY CONTROL RECORDS

These are the documents, which demonstrate achievement of required Quality and effective operation of quality systems during manufacturing of an item as per QAP / ITP . These may include but not limited to following:

Quality Assurance Plan

Procedure Qualification Records

Material Test Certificates

Stage Inspection Records / Test Reports Visual and dimensional inspection records

Calibration Records

NDT records

PMI reports, Pressure test reports

Statutory certifications

Any other test reports as specified in relevant codes / specifications.

5.0 METHODOLOGY AND CONTROLS

5.1 GENERAL

5.1.1 The EPC/LSTK Contractor shall maintain an effective Quality Assurance System, to ensure that all materials supplied for the Project meet the required Quality standards and specifications.

5.1.2 TPIA shall be appointed as per contract requirements.

5.1.3 Items as given below do not fall under the categorization of inspection and EPC/LSTK Contractor should get in touch with Site in charge for methodology/acceptance of these items.

Cement

Reinforcement bars

Structural steel material & plates as per IS-2062. Hand railing material

Wrapping & Coating material

Paints

Chemicals and Cleaning agents

Oil lubricants Insulation material Earthing material

Hardware used at Site for Electrical and Instrumentation items

Loose spares

Any other non critical item.

5.1.4 All materials shall be procured from the Suppliers approved by PMC / OWNER as per contract. Inspection shall be performed at respective supplier's / sub-supplier's works.

5.1.5 EPC/LSTK Contractor shall ensure that all requisite facilities including instruments / gauges for inspection are made available to Inspection Authorities.

5.1.6 PMC/Owner reserves the right to visit supplier / sub suppliers' works at any stage of order execution.

5.2 CATEGORIZATION

Various materials to be procured by the EPC/LSTK Contractor depending upon their criticality shall be categorized into following inspection categories for carrying out inspection and testing. The EPC / LSTK Contractor shall submit at the time of Kick Off Meeting or earlier, the "Categorization Plan for inspection" of all materials to be procured by them for approval, to PMC and OWNER. This should include major sub-ordered items, source (Indigenous & Imported) and quantity.

Category A: Stage wise & final inspection as per approved QAP by TPIA and EIL. .

Category B: All stage wise inspection, Vendors internal test record review, Raw material receipt to assembly of finished product including final inspection by TPIA as per approved QAP. Final testing of the items shall be witnessed by EIL.

Category C: Final inspection including Document Review by TPIA.

Category D: Methodology to be finalized with EIL Site – In charge as per clause 5.1.3 above

Scope of participation in inspection stages for each agency (EPC, TPIA and PMC) will be identified in accordance with above categorization.

Activities in respect of QAP / ITP and IRN /IC for categories will be as below:

For PMC category A & B : QAP/ITP approval by EPC , TPIA & PMC.
IRN/IC issued by TPIA and to be endorsed by PMC

For PMC category C : QAP/ ITP approval by EPC , TPIA & PMC.
IRN/IC to be issued by TPIA.

5.3 QUALITY ASSURANCE PLAN / INSPECTION AND TEST PLAN (QAP / ITP)

PMC's Inspection and Test Plans for major items are generally attached to the bid document. These ITPs are indicative and generic only. Based on these ITPs, EPC / LSTK Contractor / Supplier shall generate detailed QAP/ITPs applicable for the specific item ordered. Wherever PMC's ITP is not attached, the EPC/LSTK Contractor / Supplier shall generate the detailed QAP/ITP. The QAP/ITP shall give complete listing of stages of inspection, final inspection, tests and material certification requirements for the item, meeting all requirements specified in the Contract Document / Approved PS / Approved Drawings & Data sheets and shall clearly indicate Hold (H), Witness (W) Inspection, Review (R) stages of inspection to be carried out as per categorization plan. For the manufacturer, all the stages of inspection shall be HOLD points and no stage shall be offered to TPIA / PMC/ OWNER without having performed/witnessed such stages.

EPC/LSTK contractor may opt for making a standard ITP for each bulk items viz. fittings, flanges, valves, pipes, hoses, gaskets, fasteners, cables, cable glands, instrument tube & fittings, pressure gauge, temperature gauge, level gauge, manometers etc.

EPC/LSTK Contractor shall submit QAP/ITP duly approved by Contractor and TPIA along with following documents to PMC for approval.

- Un priced Purchase Order copy
- Approved Purchase Specification
- Drawings in latest revision (as applicable)
- Agreed Deviations, if any
- Approved Categorization Plan

EPC/LSTK Contractor / TPIA shall ensure that all personnel engaged in performing the activities have requisite qualification and relevant work experience wherever required. Specialized operators shall be qualified and certified.

NDT operators employed, if any, shall be certified as per ASNT/ISNT and shall have valid certificates.

5.4 INSPECTION

5.4.1 EPC/LSTK Contractor shall notify in writing to the concerned RPO (PMC), and OWNER, at least 10 days in advance of the date and the place at which the item will be ready for witnessing inspection/testing by PMC and /or OWNER. Following documents shall be submitted along with inspection notice:-

- Un priced copy of each Purchase Order
- Approved Purchase Specification
- Drawings approved in code 1/R Agreed Deviations
- Approved QAP / ITP
- Approved Categorization Plan.

- 5.4.2 The Contractor shall ensure that all items covered by statutory regulations are inspected at the manufacturer's works and duly certified by competent authority. For such items TPIA/ PMC intervention, if any, shall be indicated in QAP.
- 5.4.3 TPIA shall check the calibration status and traceability of all instruments used by the supplier, for testing. In case, TPIA uses their own instruments for testing purposes, similar certification shall be ensured.
- 5.4.4 All bulk items like pipes, fittings, fasteners etc. shall be color coded as per instructions given in the specifications by the Supplier.
- 5.4.5 TPIA shall carry out physical verification of all spares and check their quantity, quality, model etc. to confirm compliance to requirements.
- 5.4.6 PMC scope of inspection at foreign supplier works (imported items) shall be as per contract.
- 5.4.7 EPC/ LSTK Contractor shall necessarily appoint at their cost, any one of the following Third Party Inspection Agencies for the complete contract:

- **Certification Engineers International Ltd. (CEIL)**
- **Lloyds Register of Industrial Services (LRIS)**
- **Det Norske Veritas (DNV)**
- **Bureau Veritas (BV)**
- **TUV**

5.5 INSPECTION CERTIFICATE / IRN

TPIA shall issue an IC/IRN after satisfactory completion of all required stages of Inspection as per approved QAP/ITP and after ensuring compliance to specified requirements of all relevant applicable documents. The Inspection Certificate shall give reference of the approved documents including QAP/ITP referred for inspection and tests carried out, balance activities and short supplies, if any.

IC/IRN to be issued only after drawings/data sheets are approved by PMC in Code 1/R, unless otherwise agreed.

The IC / IRN shall indicate the following:

Job No. / Project Title / PO. No. / Purchase Specification No.

Item Tag No. / Item description / Quantity released

Manufacturer's Name

Date & Place of Inspection.

Reference of Documents with Revision status. (It shall be clearly indicated in the inspection certificate that "INSPECTION HAS BEEN CARRIED OUT BASED ON CODE 1/R DRAWINGS AND APPROVED ITP".)

Details of Inspection carried out.

Deviations, shortages if any.

IC/IRN issued by the TPIA shall be accompanied with the documents as per approved QAP/ITP.

6.0 DOCUMENTATION AND CONTROLS

6.1 FINAL DOCUMENTS.

On completion of each order, EPC / LSTK Contractor shall submit the final documents to the owner in requisite number of copies, as detailed in the Contract document. The final documents supplied shall be duly endorsed by the TPIA as “DOCUMENTS VERIFIED AND CERTIFIED FOR COMPLETENESS AS PER CONTRACT”. Document completeness certificate by TPIA shall be issued, if specified.

ANNEXURE

GUIDELINE FOR ITEM CATEGORIZATION PLAN

Abbreviations:

EPC :	:	Engineering, Procurement & Construction
H	:	Hold
IC	:	Inspection Certificate
IR	:	Inspection Report
IRN	:	Inspection Release Note
ITP	:	Inspection and Test Plan
LSTK	:	Lump Sum Turn Key
P	:	Perform
PMC	:	Project Management Consultant
PO	:	Purchase Order
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PS	:	Purchase Specification
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QAP	:	Quality Assurance Plan
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1.0 PURPOSE

The purpose of this document is to provide guideline for preparation and approval of item Categorization Plan for Inspection and defines the role of various agencies involved.

2.0 SCOPE

This guideline is applicable for all items to be supplied by the Contractor / Package supplier against the awarded package.

3.0 REFERENCES

Bid / Contract Document

4.0 DEFINITIONS

4.1 OWNER

Owner shall mean the project owner or end user.

4.2 PMC

PMC shall mean Project Management Consultant.

4.3 EPC/LSTK CONTRACTOR

EPC/LSTK Contractor means any party whose scope includes Engineering, Procurement, Construction and Commissioning of the Unit / Facilities /

System on Lump Sum basis, covered under the specified scope of work as per the Contract document. Contractor, EPC Contractor and LSTK Contractor are considered synonymous.

4.4 SUPPLIER

Supplier means any party supplying any of the equipment, material, products and services to the Project.

4.5 SUB SUPPLIER

Sub supplier means any party on whom supplier orders items and whose role is defined in ITPs.

4.6 QUALITY ASSURANCE PLAN (QAP) / INSPECTION AND TEST PLAN (ITP)

It is a document generated by the supplier with complete listing of various Inspection stages, tests, material certification requirements and parties involved With their respective roles in inspection; indicating the requirements of Hold (H), Witness (W) stages and Review (R) of Quality control documents /records for the material.

4.7 THIRD PARTY INSPECTION AGENCY (TPIA)

Third Party Inspection Agency means an inspection agency appointed for carrying out Inspection and witness of tests of item being procured by the Contractor / Package supplier for the Project.

4.8 INSPECTION CATEGORY

Inspection category determines the scope of Inspection for the Supplier, TPIA, PMC / OWNER for various items depending upon criticality as identified in categorization plan.

4.9 INSPECTION MONITOR

An inspection engineer at HO or at RPO, nominated by HOD (I).

4.10 REGIONAL PROCUREMENT OFFICE (RPO)

Inspection office of EIL, located at various locations.

5.0 METHODOLOGY AND CONTROLS

- 5.1 Various items to be procured by the EPC/LSTK Contractor, depending upon their criticality has been categorized as per Table-1 .Roles and responsibilities of various stake holders as per categorization plan are defined in table-2. The EPC / LSTK Contractor shall submit at the time of Kick Off Meeting or earlier, the "Categorization Plan" of all items to be procured for the project to PMC and OWNER for approval.
- 5.2 TPIA shall be appointed as per contract requirements.
- 5.3 Items given below do not fall under this categorization plan.
EPC/LSTK Contractor / Package supplier should get in touch with Site in charge for methodology/acceptance of these items.
- Cement .Reinforcement bars
 - Structural steel material & plates as per IS-2062. Hand railing material
 - Wrapping & Coating material
 - Paints, Chemicals and Cleaning agents
 - Oil lubricants Insulation material Earthing material
 - Hardware used at Site for Electrical and Instrumentation items
 - Loose spares
 - Any other non critical item.
- 5.4 All items shall be procured from the Suppliers approved by PMC /OWNER as per contract. Inspection shall be performed at respective supplier's / sub-supplier's works.
- 5.5 PMC/Owner reserves the right to visit supplier / sub suppliers' works at any stage of order execution.
- 5.6 Categorization plan shall be reviewed and approved by inspection monitor.

TABLE-1

Sr.No.	Item Description	Item Category
1	CYCLONES(REACTOR & REGENERATOR)	B
2	DEMISTER-WIRE MESH TYPE	C
3	REACTOR REGENERATOR PKG-FCC	A
4	SECONDARY SEAL FLOATING ROOF TANK	C
5	CCR PLATFORMING REACTOR	A
6	REACTOR/SEPARATOR-SS CLAD 1.25 Cr0.5 MO	A
7	REACTOR/SEPARATOR-SS CLAD-2.25 Cr-1 Mo	A
8	REACTOR/SEPARATOR- CLAD 2.25Cr 1Mo 0.25V	A
9	REACTOR-GLASS LINED	A
10	CRUDE & VACUUM COLUMN	A
11	AIR FIN COOLER (CS & SS)	B
12	AIR FIN COOLERS (DUPLEX SS)	A
13	HEAT EXCH-HIGH PR(SCREW PLUG/BREACH LOCK	A
14	HEAT EXCHANGER (AL.BRAZED FIN TYPE)	B
15	HEAT EXCHANGER-GRAPHITE	B
16	ELECTRIC HEATER	C
17	MAIN COMBUSTN. CHAMBER PKG(SRU)-ENGINEERED	B
18	INCINERATOR PACKAGE FOR SRU	B
19	COLUMN-CDU/VDU SITE FABRICATED	A
20	OUTBOARD STEAM GENERATOR	B
21	EXPANSION JOINT-METALLIC	C
22	TOP & BOTTOM COVER REMOVAL ARRANGEMENT.	C
23	AGITATOR	C
24	LNG VAPORIZER	B
25	PIPING SYSTEM-GRE/GRP	C
26	SPRING SUPPORTS	C
27	STEAM TRAPS-BUCKET/TH .DYN/TH .STAT/FLOAT	C
28	COMPACT STEAM TRAPPING ASSY+SS/CR MANIFOLD	C
29	PIPELINE CONNECTORS	C
30	STEAM TRAPS	C
31	STEAM SUPPLY / COND. RECOVERY MANIFOLD	C
32	PIPING SYSTEM-CLAD(SHOP FABRICATED)	B
33	PRE-FABRICATED PIPING SPOOL	B
34	HOT INDUCTION BEND	B
35	NON STANDARD FORGINGS-CARBON STEEL	B
36	NON STANDARD FORGINGS-ALLOY STEEL	B
37	NON STANDARD FORGINGS- STAINLESS STEEL	B
38	FORGINGS TUBE SHEET- CARBON STEEL.	B
39	FORGINGS TUBE SHEET- ALLOY STEEL.	B
40	FORGINGS TUBE SHEET- STAINLESS STEEL.	B
41	PUMP_CENT.HOR(GPP)	B
42	PUMP-CENT. HOR(SPP)	B
43	PUMP-CENT. HOR(GWS)	C
44	PUMP-CENT. HOR(LCWS)	B

Sr.No.	Item Description	Item Category
45	PUMP-CENT.HOR.(MOLTEN SULPHUR)	B
46	PUMP-CENT. VERT(GPP)	B
47	PUMP-CENT.VERT. BARREL TYPE(SPP)	B
48	PUMP-CENT. VERT.(GWS)	C
49	PUMP-CENT. VERT(LCWS)	B
50	PUMP-CENT.VERT.(MOLTEN SULPHUR)	B
51	PUMP-CENT.(BFW)	B
52	PUMP-CENT.CAN MOTOR	B
53	PUMP-CENT.SU.M(CRYO)	B
54	PUMP-CENT.H/V(FW)	B
55	PUMP-CENT.GRAPHITE	B
56	PUMP-CENT.SEAL LESS	B
57	PUMP-CENT.HOR.MULTI STAGE(SPP)	B
58	PUMP-CENT.(LOW CAPACITY HIGH HEAD)	B
59	PUMP-ROTARY.SCREW	B
60	PUMP-ROTARY.GEAR	B
61	PUMP-ROTARY.SL.VANE	B
62	PUMP-ROT.SCR.ARC(ES)	B
63	PUMP-ROTARY(LOBE)	B
64	PUMP-SLURRY.RECIPRO	B
65	PUMP-SLURRY.CENT.HA/	B
66	PUMP-SLURRY CENT REC.IMPELLAR	B
67	PUMP-SLURRY.CENT(PS)	B
68	PUMP-RECIPRO(API 675,PLUNGER/DIAPHRAGM)	B
69	PUMP-RECIPRO(API 674)	B
70	PUMP-A.F. PROPELLER	B
71	PUMP - AIR OPERATED DIAPHRAGM	B
72	COMP-RECIPRO(SPP)	B
73	COMP-RECIPRO(PIANS)	B
74	COMP-RECIPRO(DIAPHRAGM)	B
75	COMP-RECIPRO(LABYRINTH)	B
76	COMP. HIGH PRESSURE (PIANS)	B
77	COMP-CENT.(SPP)	B
78	COMP-CENT.P.I.G(PIA)	B
79	COMP-ROT.LOBE/VP(PS)	B
80	COMP-ROT.LOBE/VP(AS)	B
81	COMP-ROT.LIQUID RINGA/P(PS)	B
82	COMP-ROT.LIQUID RING/VP(AS)	B
83	COMP-ROT.SCREW(PS)	B
84	COMP-ROT.SCREW(PIAS)	B
85	COMP-MOBILE	B
86	COMP-EXPANDER(PRO)	B
87	COMP-EXPANDER(AIR)	B
88	TURBINE-STEAM(GP)	B
89	TURBINE-STEAM(SP)	B
90	TURBINE-GAS	B

Sr.No.	Item Description	Item Category
91	FAN-ID/FD	B
92	FAN-AXIAL FLOW	B
93	DIESEL ENGINE	B
94	DG SET	B
95	GAS ENGINE GENERATING SET	B
96	BLOWER-TURBO CENTRIFUGAL	B
97	MECH.SEAL FOR PUMPS/AGITATORS	B
98	LONG RANGE MONITOR	B
99	REMOTE CONTROLLED MONITORS	B
100	COOLING TOWER - CONCRETE	C
101	FIRE PROOF DOORS & WINDOWS	C
102	FIRE EXTINGUISHERS (PORTABLE)	C
103	SAFETY SHOWER & EYE WASHER	c
104	CLEAN AGENT SYSTEM	c
105	DELUGE VALVE AND HEAT DETECTORS	c
106	HOSE DELIVERY	c
107	FIRE HOSE ACCESSORIES	c
108	FOAM MAKER	B
109	VAPOUR SEAL CHAMBER	C
110	BRANCH PIPES	C
111	INLINE INDUCTORS	C
112	TRAILER MOUNTED FIRE FIGHTING EQUIPMENT	B
113	CHASIS MOUNTED FIRE FIGHTING EQUIPMENT	B
114	WATER SPRINKLER	C
115	FIXED FOAM SYSTEM (FOAM PACKAGE)	B
116	HYDRANT/LANDING VALVE	C
117	FIXED CO2 SYSTEM	C
118	SPRAY NOZZLE- FIRE FIGHTING	C
119	AUTO DCP EXTINGUISHING SYSTEM	C
120	HV/MV SPRAY SYSTEMS	B
121	RIM SEAL FIRE PROTECTION SYSTEM	B
122	WATER MONITOR	B
123	WATER CUM FOAM MONITOR	B
124	GAS CONDITIONING SKID	B
125	SCRUBBERS - SPRAY TYPE	B
126	SCRUBBERS - VENTURI TYPE	B
127	DOSING PACKAGE(SKID MOUNTED)	B
128	LIME PREP. SYSTEM.	C
129	BARREL RECLAIMER	C
130	CRUSHING SYSTEM	B
131	ADDITIVE MIXING SYSTEM	C
132	CRANE MOBILE (CRAWLER/TYRE MOUNTED)	C
133	CRANE H.O.T. (HAND OPERATED)	C
134	CRANE- E.O.T (SAFE AREA)	B
135	JIB CRANE	C

Sr.No.	Item Description	Item Category
136	OFFSHORE DECK CRANE	C
137	ELECTRIC HOISTS	C
138	CHAIN PULLEY BLOCK	C
139	CRANE- E.O.T (HAZARDOUS AREA)	B
140	CONVEYOR OVERHEAD/DRAG-CHAIN	C
141	CONVEYOR DRAG CHAIN	C
142	ENMASSE CHAIN CONVEYOR	C
143	CONVEYOR -ROLLER GRAVITY	C
144	CONVEYOR -ROLLER POWERED	C
145	CONVEYOR -APRON.	C
146	CONVEYOR - SCREW	C
147	CONVEYOR -SLING CHAIN	C
148	CONVEYOR PNEUMATIC SYSTEM	C
149	CONVEYOR-BELT TYPE	C
150	BELT FOR CONVEYOR	C
151	ELECTROMAGNETIC VIBRATING FEEDER	C
152	VIBRATING SCREEN	C
153	LIFTS (PASSENGER & GOODS)	C
154	ELEVATOR-BUCKET	C
155	DUMPERS	C
156	LOADERS	C
157	TIPPLERS	C
158	EXCAVATOR (HYDRAULIC)	C
159	EXCAVATOR (BUCKET WHEEL)	C
160	TRACTOR (CRAWLER)	C
161	ROAD ROLLER	C
162	TRACTORS (TYRE MOUNTED)	C
163	TRAILERS	C
164	FORK LIFT TRUCK	C
165	AERIAL TOWER WAGONS	C
166	TELESCOPIC ACCESS PLATFORM	C
167	ELECTRIC SHOVEL	C
168	HYDRAULIC SHOVEL	C
169	STACKER/STACKER RECLAIMER	C
170	ROTARY DRILLS (BL.HOLE)	C
171	ROTARY DRILLS (EXPLORATORY)	C
172	FLUID BED CALCINER	C
173	LPG FILLING MACHINE	C
174	PLASTILATOR	C
175	HYDRAULIC DECOKING SYSTEM	c
176	HOT TAPPING MACHINE	B
177	BAGGING & PALLETIZING LINES	C
178	CRYSTALLIZERS	B
179	ROTARY KILN	B
180	ROTARY DRYER	B
181	ROTARY COOLER	C

Sr.No.	Item Description	Item Category
182	GRANULATOR	C
183	AIR CONDITIONING SYSTEM - CENTRAL	C
184	INERT GAS GENERATOR-PSA TYPE	B
185	AIR CONDITIONING SYSTEM - PACKAGE UNIT	C
186	REFRIGERATION SYSTEM - PROCESS	C
187	REFRIGERATION SYSTEM- VAPOUR ABSORPTION	C
188	VENTILATION & PRESSURIZATION SYSTEM	C
189	AIR HANDLING & FAN COIL UNIT	C
190	VAPOUR RECOVERY SYSTEM	C
191	HVAC SYSTEM	B
192	CATALYST DRUM EMPTYING DEVICE	B
193	EXTRUDER & PALLETIZER PACKAGE	B
194	SULPHUR PALLETIZATION PACKAGE	C
195	MELTING CUM HOLDING FURNACE	C
196	ADDITIVE UNLOADING SYSTEM	C
197	LOSS IN WEIGHT FEEDER	C
198	CATALYST DRUM TILTING DEVICE	C
199	HEADING/UNHEADING SYSTEM - COKE CHAMBER	B
200	POWDER FEED WEIGHING UNIT	C
201	BELT SCALE	C
202	LIME STORAGE AND SLAKING SYSTEM	C
203	FLUE GAS COOLER PACKAGE	B
204	CYCLONES (HYDRO)	B
205	CYCLONES (PNEUMATIC)	B
206	MULTICYCLONES	B
207	CENTRIFUGE	B
208	CENTRIFUGE-SMALL METALLURGICAL	B
209	COALESCER	B
210	COALESCER - ELECTROSTATIC	B
211	ELECTROSTATIC PRECIPITATOR	C
212	CHLORINATOR	C
213	DRIER-AIR/GAS	B
214	DRIER - FLASH	C
215	CONDENSATE POLISHING UNIT	C
216	FEED FLTR AUTO BACKWASH HYD.CRAKR DHDT	B
217	FILTER BAG TYPE	C
218	FILTER - BASKET	B
219	FILTER - CARTRIDGE/CANDLE	B
220	FILTER - LEAF TYPE	C
221	FILTER - PRESS	C
222	FILTER - PRESSURE	C
223	FILTER- ROTARY	C
224	FILTER-VACUUM	C
225	QUICK OPENING CLOSURE(FILTER/SEPARATOR)	C
226	FURNACE	C
227	FLARE STACK COMPONENTS	C

Sr.No.	Item Description	Item Category
228	DUST/FUME EXTRACTION SYSTEM	C
229	FUME TREATMENT PLANT	C
230	LOADING ARMS (MARINE)	B
231	LOADING ARMS (RAIL/ROAD)	C
232	CATALYST LOADING - UNLOADING SYSTEM	C
233	PSA HYDROGEN PLANT	B
234	CRYOGENIC AIR SEPARATION PLANT	B
235	MEMBRANE OXYGEN PLANT	B
236	PSA NITROGEN PLANT	B
237	VPSA OXYGEN PLANT	B
238	MEMBRANE NITROGEN PLANT	B
239	MEMBRANE UNIT	C
240	STATIC MIXER	C
241	FLAKING MACHINE	C
242	TEST SEPARATOR	A
243	FILTER SEPARATOR	B
244	SEPARATORS (FOR OIL FIELDS)	A
245	TERTIARY SEPARATOR	A
246	MAGNETIC SEPARATOR	B
247	COATING MATL.(CTE/PRIMER)	C
248	COAL TAR COAING TAPES	C
249	CRUSHER (JAW)	C
250	CRUSHER (GYRATORY)	C
251	CRUSHER (CONE)	C
252	BOWL MILLS	C
253	CRUSHER ROLLER	C
254	BALL MILLS	C
255	ROD MILLS	C
256	TUBE MILLS	C
257	IMPACTORS	C
258	HAMMER MILLS	C
259	VIBRATORY FEEDER	C
260	GRINDING & PULVERISING SYSTEM	C
261	THICKENERS & CLARIFIERS	C
262	UOP JOHNSON SCREEN	C
263	CRUSHER (HAMMER)	C
264	RAIL & ROAD WEIGH BRIDGE	C
265	ELECTRONIC WEIGH SCALE	C
266	BELT WEIGH FEEDER	C
267	BAG STICHING MACHINE	c
268	METERING UNIT PACKAGE (WEIGHING SYSTEM)	c
269	BAG SLITTING PACKAGE	c
270	TOWER PACKING:METALLIC(NON-PROPRIETARY)	c
271	TOWER PCKG & ASSTD INTLMETLIC (PROPRTRY)	c
272	TOWER PKG:NON METALLIC(PROPRIETARY)	c
273	TOWER PACKING:CERAMIC	c

Sr.No.	Item Description	Item Category
274	COLUMN TRAYS-VALVE/SIEVE(EIL-ENGINEERED)	c
275	TOWER INTERNALS (ENGINEERED BY EIL)	c
276	STRD.PKGS.& ASSOC.INTERNAL(S) (PROPRIETARY)	c
277	COLUMN TRAYS (UNENGINEERED)	c
278	TOWER INTERNALS (UNENGINEERED)	c
279	EI GRID & ASSOCIATED INTERNALS	c
280	COLUMN TRAYS-HIGH CAPACITY	c
281	NON-PROP. PACKGS WITH CONVENL INTERNALS	c
282	NON-PROP PKG.HIGH QUAL DISR& INL-UNENGIN	c
283	INLET FEED DEVICE (VANE TYPE - EIL DESG)	c
284	SEPARATOR INTERNALS	c
285	REACTOR INTERNAL	c
286	SPRAY NOZZLE-PROCESS	c
287	SPRAY NOZZLE-TORCH OIL	c
288	TOWER PACKING:CARBON	c
289	TOWER PACKINGS:PVC & PP(NON-PROPRIETARY)	c
290	DAMPERS FOR GAS TURBINE APPLICATION	c
291	SWITCHBOARD-HV (INDOOR) WITH VCB BREAKR	B
292	SWITCHBOARD-MV:MCC/ASB/LDB-FIXED TYP	B
293	SWITCHBOARD-M.V.-MCC/PCC/PMCC-DRAWOUT	B
294	SWITCHBOARD FIXED FOR PACKAGE EQUIPTS	B
295	SWITCHBOARD-HV(INDOOR) WITH SF6 BREAKER	B
296	M V SYSTEM PACKAGE	B
297	H V SYSTEM PACKAGE	B
298	CIRCUIT BREAKERS-VCB OUTDOOR (HV)	B
299	BATTERIES-LEAD ACID (FLOODED)	C
300	BATTERY CHARGERS	B
301	BATTERIES-LEAD ACID (VRLA)	C
302	BATTERIES-NICKLE CADMIUM	C
303	U.P.S.SYSTEM	B
304	SOLAR ELECTRIC POWER SYSTEM	B
305	MOTOR-INDUCTION-HV(INDL. TYPE SAFE AREA)	B
306	MOTOR-INDUCTION(HV INCREASED SAFETY ZN2)	B
307	MOTOR INDUCTION-MV (INDL.TYPE SAFE AREA)	B
308	MOTOR-INDUCTION-M.V(ZONE 2-TYPE e & n)	B
309	MOTOR-INDUCTION-M.V (FLAME PROOF)	B
310	MOTOR-SYNCHRONOUS-H.V.	B
311	MOTORS - IMPORTED	B
312	TRANSFORMERS-POWER-ABOVE 5MVA	B
313	TRANSFORMERS-DISTRIBUTION-UPTO 5MVA	B
314	TRANSFORMER-DISTRIBUTION(DRY TYPE)	B
315	TRANSFORMER-RECTIFIER UNIT FOR C.P.S.	B
316	LIGHTING FIXTURE & ACCESSORIES-HAZARDOUS	C
317	FLP ELECTRICAL FITTINGS (IMPORTED)	C
318	HIGH MAST LIGHTING SYSTEM	B
319	PLUGS/SOCKETS/HANDLAMPS (FLAME PROOF)	C

Sr.No.	Item Description	Item Category
320	CONTROL PANEL (FLP)	B
321	EPABX SYSTEM	B
322	CABLES-HIGH VOLTAGE-XLPE	B
323	ACSR conductor	C
324	CAPACITORS-HIGH VOLTAGE	B
325	NEUTRAL GROUNDING RESISTORS-H.V.	B
326	PLANT COMMUNICATION SYSTEM	B
327	ELECTRIC CONTROL SYSTEM (BASE LEVEL)	B
328	ELECTRIC CONTROL SYSTEM (BASE+ADVANCE)	B
329	FIRE ALARM SYSTEM	B
330	EMERGENCY GENERATORS (MV)	B
331	SYNCHRONOUS GENERATORS (HV)	B
332	ACTUATORS-MOV	C
333	A.C. VARIABLE SPEED DRIVE	B
334	AIR CIRCUIT BREAKER	C
335	AUX. RELAYS	C
336	BIMETAL RELAYS	C
337	BUS DUCTS (M.V)	B
338	BUS DUCT (H.V)	B
339	BUCHHOLZ RELAY	C
340	CABLE TERMN. & JOINTING KIT	C
341	CIRCUIT BREAKER SF-6 OUTDOOR EHV	B
342	CKT.BREAKER-MIN.OIL-E.H.V.-OUTDOOR	B
343	CKT.BREAKER-VACUUM-E.H.V.-OUTDOOR	B
344	CIRCUIT BREAKER SF-6 OUTDOOR HV	B
345	CABLE TRAYS-FRP	C
346	HEAT TRACERS	C
347	INSTRUMENT TRANSFORMERS CT & PT (MV)	C
348	INSTRUMENT TRANSFORMERS CT & PT (HV)	B
349	CT/PT OUTDOOR (EHV)	B
350	ISOLATOR & EARTHING SWITCH OUTDOOR EHV	B
351	ISOLATOR OUTDOOR H.V. UP TO 33 KV.	B
352	ISOLATORS/LOAD BREAK SWITCHES(HV INDOOR)	B
353	LIGHTNING ARRESTORS	C
354	LIGHTING FIXTURE & ACCESORY-NON HZARDOUS	C
355	MCCB	C
356	ON LOAD TAP CHANGER	C
357	PROTECTION RELAYS	C
358	VACUUM INTERRUPTER	C
359	RELAY & CONTROL PANEL	B
360	CABLES - EXTRA HIGH VOLTAGE	B
361	SWITCHBOARD-HV-GAS INSULATED	A
362	SWITCHBOARD-EHV-GAS INSULATED	A
363	CONTROL STATIONS- WEATHERPROOF	C
364	CONTROL STATIONS-FLAME PROOF	C
365	JUNCTION BOXES (FLAME PROOF)	c

Sr.No.	Item Description	Item Category
366	LIGHTING & POWER PANELS (FLP)	B
367	MV POWER CABLE - FIRE SURVIVAL	B
368	CABLES-MEDIUM VOLTAGE-POWER-PVC	C
369	CABLES:CONTROL-PVC	C
370	CABLES-FIRE ALARM AND COMMN.	B
371	CONTROL CABLE - FIRE SURVIVAL	B
372	CABLES COMMN. (JELLY FILLED)	B
373	CABLE GLANDS (HAZARDOUS AREA)	C
374	CONTACTORS	C
375	CONTROL SWITCHES (BREAKER)	C
376	CONTROL SWITCHES / SELECTOR SWITCHES	C
377	EARTH LEAKAGE CIRCUIT BREAKER	C
378	FUSES	C
379	HEAVY DUTY SWITCHES	C
380	LIGHTING & POWER PANELS (SAFE AREA)	C
381	LIGHTING TRANSFORMERS	C
382	MCB	C
383	METERS	C
384	MAGNETIC OIL LEVEL GAUGE	C
385	OIL TEMPERATURE INDICATOR	C
386	PUSH BUTTON AND INDICATING LAMPS	C
387	FUSE SWITCH COMBINATION	C
388	TIMERS	C
389	WINDING TEMPERATURE INDICATOR	C
390	SPECIAL CONTROL VALVES-MIXED	B
391	PILOT OPERATED SAFETY VALVES	B
392	SAFETY VALVES BOILER SERVICE	C
393	SURGE RELIEF VALVE	B
394	SPECIAL CONTROL VALVES (ECC.ROTARY PLUG)	B
395	SPECIAL CONTROL VALVES (SEGMENTAL)	B
396	SPECIAL CONTROL VALVES (PLUG)	B
397	SPECIAL CONTROL VALVES (BALL CONTROL)	B
398	SPECIAL CONTROL VALVES (AXIAL)	B
399	SPECIAL CONTROL VALVES (VARIABLE CV)	B
400	SPECIAL CONTROL VALVES (LOW CV)	B
401	SPECIAL CONTROL VALVES (PISTON)	B
402	SPECIAL CONTROL VALVE (FLUSH BOTTOM)	B
403	PROCESS STREAM ANALYSER(ELECTROCHEM-02)	B
404	WATER QUALITY ANALYSERS (SILICA)	B
405	WATER QUALITY ANALYSER-DISSOLVED OXYGEN	B
406	WATER QUALITY ANALYSER SYSTEMS	B
407	PROCESS STREAM ANALYSERS (02-ZIRCONIA)	B
408	PROCESS STREAM ANALYSER-MOISTURE/ DEW PT	B
409	WATER QUALITY ANALYSER-OIL IN H2O TOC/TC	B
410	WATER QUALITY ANALYSER-OIL IN H2O DISLVD	B
411	WATER QUALITY ANALYSERS(CHLORINE)	B

Sr.No.	Item Description	Item Category
412	ORIFICE PLATES & FLANGES	C
413	FLOW ELEMENTS-WEDGE TYPE	B
414	FLOW ELEMENTS:(VENTURI,FLOW NOZZLES)	B
415	OPTICAL PYROMETERS	C
416	SPECIAL TEMPERATURE ELEMENTS	B
417	GAS DETECTION SYSTEMS	B
418	FIRE & GAS DETECTION SYSTEMS	B
419	PRODUCT QUALITY ANALYSERS (NIR)	B
420	PRODUCT QUALITY ANALYSERS (VISCOSITY)	B
421	PRODUCT QUALITY ANALYSERS (DENSITY)	B
422	PRODUCT QUALITY ANALYSERS (FLASH POINT)	B
423	PRODUCT QUALITY ANALYSERS (DISTILLATION)	C
424	PRODUCT QUALITY ANALYSER (SULPHUR)	B
425	STACK GAS ANALYSERS (O ₂ -ZIRCONIA)	B
426	ANALYSER-DENSITY/SP. GRAVITY (NUCLEONIC)	B
427	ANALYSER-DENSITY/SP GRAVITY (VIB CYLINDR)	B
428	ANALYSER-DENSITY/SP GRAVITY (CORIOLIS)	B
429	AUTOMATIC LIQUID SAMPLER	C
430	ANALYSER-STATIC PROBES	C
431	DRY COLORI METRIC (TAPE) DETECTORS	C
432	PRODUCT QUALITY ANALYSERS (RVP)	B
433	WOBBE METERS	B
434	PROGRAMMABLE LOGIC CONTROLLERS	B
435	SPECIAL FLOWMETERS-SOLIDS	B
436	VARIABLE AREA FLOW METERS(I.T)	B
437	MAGNETIC FLOW METERS	B
438	TERMINAL AUTOMATION SYSTEM	B
439	POSITIVE DISPLACEMENT METERS	B
440	ULTRASONIC FLOW METER	B
441	TARGET FLOWMETERS	B
442	VORTEX FLOW METER	B
443	TURBINE FLOW METERS	B
444	MASS FLOW METERS	B
445	DRUM LEVEL INSTRUMENTS (ELECTRONIC)	B
446	DRUM LEVEL INSTRUMENTS (BI-COLOUR GAUGE)	B
447	TANK LEVEL INSTRUMENTS (FLOAT OPERATED)	C
448	MAGNETIC LEVEL INSTRUMENTS	C
449	SPL. LEVEL INSTRUMENTS-GUIDED WAVE RADAR	B
450	TANK FARM MANAGEMENT SYSTEM	A
451	TANK LEVEL INSTRUMENT (SERVO TYPE)	B
452	SPECIAL LEVEL INSTRUMENTS (RF TYPE)	B
453	SPECIAL LEVEL INSTRUMENTS (CAP.& COND.)	C
454	LEVEL SWITCHES(DISPLACER/FLOAT)	C
455	MACHINE MONITORING SYSTEMS	B
456	OPTICAL FIBRE CABLE & ASSOC.ITEM	B
457	FIELD BUS SIGNAL CABLES	B

Sr.No.	Item Description	Item Category
458	SPECIAL LEVEL INSTRUMENTS (TUNNING FORK)	C
459	CORROSION MONITORS	B
460	CONTROL VALVE POSITIONER	C
461	SOLENOID VALVES	C
462	CONTROL VALVES	B
463	PRESSURE RELIEF VALVE	B
464	TANK PR. PROTECT. DEVICES / FLAME ARRSTR	C
465	ON-OFF VALVES	B
466	SELF ACTUATED PR.CONTROL VALVES	B
467	CONTROL VALVE ELECTRO-HYDRAULIC ACTUATOR	C
468	SP CONTROL VALVES (ECC. DISC HI PERF)	B
469	SPECIAL CONTROL VALVES (BUTTERFLY)	B
470	SELF ACTUATED FLOW CONTROL VALVES	B
471	DESUPERHEATERS & PRDS	B
472	PR.REGULATOR & SLAM SHUT VALVES	B
473	NUCLEONIC LEVEL INSTRUMENTS	B
474	CLOSED CIRCUIT TV	B
475	LOOP POWERED INDICATORS	C
476	TRANSDUCERS (I/P.P/I)	C
477	FIELD INSTRUMENTS (P,DP,F,L,T,TD)	C
478	RECEIVER INSTRUMENTS	C
479	TANK LEVEL INSTRUMENT (RADAR,ULTRASONIC)	B
480	SPEED TANSMITTERS	C
481	INFRARED TEMP MEASUREMENT SYSTEM	C
482	CONTROL PANEL & ACCESSORIES	B
483	PREFABRICATED INSTRUMENT HOOKUPS	C
484	ACCESS CONTROL SYSTEM	C
485	INSTRUMENT BLOWBACK SYSTEM	C
486	SP. CONTROL VALVE (KNIFE GATE)	B
487	FIRE PROTECTION SYSTEM (VALVES & ACC.)	B
488	ANALYSR-DENSTY/SP.GRAVTY(V.CYLNDR,CORLIS	B
489	ANALYSER (AIR DEMAND/TOTAL SULPHUR)	B
490	AVERAGING PITOT TUBES	C
491	ANALYSERS (HYDROGEN SULPHIDE)	B
492	VISCOSITY METER	C
493	ALARM ANNUNCIATORS	C
494	RUPTURE DISCS	C
495	METER PROVERS	C
496	GAS PRESSURE REDUCING SKIDS	A
497	GAS METERING SYSTEM (ULTRASONIC)	A
498	GAS METERING SYSTEM (TURBINE)	A
499	GAS METERING SYSTEM -DUAL CHAMBER ORIFICE	A
500	LIQUID METERING SYSTEM (ULTRASONIC)	A
501	LIQUID METERING SYSTEM (TURBINE)	A
502	LIQUID METERING SYSTEM (P D METERS)	B
503	LIQUID METERING SYSTEM (MASS FLOW METER)	B

Sr.No.	Item Description	Item Category
504	CITY DISTRIBUTION METERING SYSTEM	B
505	TEMPERATURE RECORDERS	C
506	DISPLACER LEVEL INSTRUMENTS	C
507	DISTRIBUTED CONTROL SYSTEMS	B
508	ESC (BASE LEVEL)-REFER ITEM CODE-13SB	B
509	TRAINING SIMULATOR SYSTEM	C
510	TELECOMMUNICATION SYSTEM	B
511	BLENDING AUTOMATION SYSTEMS	B
512	ECS(BASE+ADVANCE)-REFER ITEM CODE-13SC	B
513	SCADA SYSTEMS	B
514	WIRELESS TETRA COMMUNICATION SYSTEM	B
515	EPABX SYSTEM (DIGITAL)	B
516	STATIC CONTROL SYSTEM	C
517	TURNKEY INSTRUMENTATION	B
518	GROUND MONITORING SYSTEMS	C
519	INTERFACE DEVICES	C
520	PROCESS STREAM ANALYSER(PARAMAGNETIC-02)	B
521	WATER QUALITY ANALYSERS (PH)	B
522	GAS CHROMATOGRAPH (PROCESS)	B
523	PROCESS STREAM ANALYSER(HYDROGEN-TCD)	B
524	PRODUCT QUALITY ANALYSER SYSTEMS	B
525	AUTOMATIC GAS SAMPLER	C
526	STACK GAS ANALYSER SYSTEMS (EXTRACTIVE)	B
527	GAS CHROMATOGRAPH (NATURAL GAS)	B
528	AMBIENT AIR ANALYSER SYSTEMS	B
529	WATER QUALITY ANALYSERS (TURBIDITY)	B
530	WATER QUALITY ANALYSERS (CONDUCTIVITY)	B
531	ANALYSER SHELTER	C
532	PROCESS STREAM ANALYSER(IR/UV)	B
533	PROCESS STREAM ANALYSER(H.C.-TCD/FID)	B
534	ANALYSER SYSTEMS	B
535	STACK GAS ANALYSER SYSTEMS (INSITU)	B
536	STACK GAS ANALYSERS (SPM)	B
537	DIFFERENTIAL PRESSURE GAUGES	C
538	TEMP.GAUGES(BI METALLIC,FILLED SYSTEM)	C
539	GAUGE GLASSES & COCKS	C
540	PRESSURE SWITCHES	C
541	THERMAL FUSE	C
542	INSTRUMENT VALVES& MANIFOLDS	C
543	TEMP.ELEMENTS.THERMOWELLS	B
544	SKIN THERMOCOUPLES	C
545	PRESSURE GAUGES	C
546	DRAFT GAUGES	C
547	TUBE FITTINGS	C
548	INSTRUMENT TUBING	C
549	AIR FILTER REGULATORS	C

Sr.No.	Item Description	Item Category
550	THERMO COUPLE EXTN.CABLES	B
551	SIGNAL CABLES	B
552	SIGNAL CABLE - FIRE RESISTANT	B
553	COPPER TUBES(COATED.BARE)	C
554	LINE PIPES (LSAW)	A
555	LINE PIPES (HELICAL SAW)	B
556	LINE PIPES ERW	B
557	LINE PIPES SEAMLESS	B
558	LONG RADIUS BENDS	B
559	FLOW TEE	B
560	SCRAPER TRAP	B
561	QUICK OPENING CLOSURE(PIPELINES)	C
562	PIG SIGNALLERS	B
563	INSULATING JOINTS	B
564	PIPELINE COATING (COATERS)(CTE/3LPE/FBE)	B
565	VALVE BALL PIPE LINE (API6D/METAL SEAT)	B
566	VALVE GATE (THRU CONDUIT) (AP16D)	C
567	VALVE PLUG PRESSURE BALANCED (NFS)	C
568	VALVE PLUG PRESSURE BALANCED (FS)	B
569	VALVE BALL PIPE LINE (API6D/SOFT SEAT)FS	B
570	VALVE CUTTING	C
571	VALVE SLIDE	C
572	VALVE SHUT DOWN	C
573	VALVE SPECIAL CATEGORY	C
574	VALVE TANK BOTTOM/FLUSH BOTTOM	C
575	VALVE-DUPLEX / SUPER DUPLEX SS	B
576	VALVE GATE CAST	C
577	VALVE GATE CRYOGENIC CAST	C
578	VALVE GATE CRYOGENIC FORGED	C
579	VALVE KNIFE GATE	C
580	VALVE GLOBE CAST	C
581	VALVE GLOBE CRYOGENIC CAST	C
582	VALVE GLOBE CRYOGENIC FORGED	C
583	Y TYPE GLOBE & STOP CHECK VALVES	C
584	VALVE- BLOWDOWN (Straight/Angle Pattern)	C
585	VALVE CHECK CAST	C
586	VALVE CHECK CRYOGENIC CAST	C
587	VALVE CHECK CRYOGENIC FORGED	C
588	VALVE CHECK (DUAL PLATE TYPE)	C
589	VALVE CHECK EXCESS FLOW	C
590	VALVE-NON SLAM CHECK (NOZZLE)	C
591	VALVE BALL CRYOGENIC	C
592	VALVE BALL NON FIRE SAFE-CCS	C
593	VALVE BALL NON FIRE SAFE-CSS	C
594	VALVE BALL FIRE SAFE-CCS	C
595	VALVE BALL FIRE SAFE-CSS	C

Sr.No.	Item Description	Item Category
596	VALVE BALL - FIRE SAFE (FORGED)	B
597	VALVE BALL NON FIRE SAFE-FCS	C
598	VALVE BALL NON FIRE SAFE-FSS	C
599	VALVE BALL JACKETED - NON FIRE SAFE	C
600	VALVE BALL MULTIPOINT NON FIRE SAFE	C
601	VALVE BUTTERFLY - CCS	C
602	VALVE BUTTERFLY -CSS	C
603	VALVE BUTTERFLY -CAS	C
604	VALVE BUTTERFLY (PTFE SEATED)	C
605	VALVE BELLOW SEALED	c
606	VALVE-BUTTERFLY (TRIPLE OFFSET)	c
607	VALVE DIAPHRAGM-(FOREIGN SUPPLIERS)	c
608	VALVE DIAPHRAGM CAST CARBON STEEL	c
609	VALVE DIAPHRAGM CAST STAINLESS STEEL	c
610	VALVE PLUG-(FOREIGN SUPPLIERS)	c
611	VALVE PLUG CONCENTRIC- CCS (F.S & N.F.S)	c
612	VALVE PLUG CONCENTRIC -CSS (F.S & N.F.S)	c
613	VALVE PLUG CONCENTRIC-CAS(F.S. & N.F.S.)	c
614	VALVE PISTON (GLANDLESS)	c
615	VALVE PLUG DBB EXPANDING TYPE	c
616	VALVE PLUG MULTIPOINT - NON FIRE SAFE	c
617	VALVE FOOT/AIR	c
618	VALVE DOUBLE DISC GATE	c
619	FLANGE- CARBON STEEL	c
620	FLANGE-ALLOY STEEL	c
621	FLANGE-STAINLESS STEEL	C
622	FLANGES-EXOTIC	C
623	COMPACT FLANGE	C
624	CLAMP CONNECTOR	C
625	HAMMER BLIND	C
626	SIGHT FLOW INDICATORS (SIGHT GLASSES)	C
627	PIPE / FITTINGS -PTFE LINED	C
628	PIPE-PVDF/FRP	C
629	PIPE-FRP	C
630	PIPE-GRE	C
631	TUBE-WELDED CARBON STEEL	C
632	TUBE-WELDED ALLOY STEEL	C
633	TUBE-TITANIUM	C
634	TUBE COPPER AND ALLOYS	C
635	FITTINGS - FRP	C
636	FITTING-GRE	c
637	YY-GROUP COMPANIES	c
638	ANODES FOR C P SYSTEM	c
639	CATHODIC PROTECTION POWER SUPPLY MODULE	c
640	FITTINGS-FOREIGN AGENTS/STOCKIST/TRADERS	c
641	FITTING BLOCK FORGED-CARBON STEEL	c

Sr.No.	Item Description	Item Category
642	FITTING BLOCK FORGED-ALLOY STEEL	c
643	FITTING BLOCK FORGED-STAINLESS STEEL	c
644	WELDOLETS/SOCKOLETS/ELBOWLET	c
645	FITTINGS BLOCK FORGED-EXOTIC MATLS.	c
646	FITTINGS FROM SEAMLESS PIPE-CARBON STEEL	c
647	FITTINGS FROM SEAMLESS PIPE- ALLOY STEEL	B
648	FITTINGS FROM SEAMLESS PIPE- S.S.	c
649	FITTINGS FROM S/LESS PIPES-EXOTIC MATLS	B
650	FIITINGS CROSS-FROM SEAMLESS PIPES	C
651	FITTINGS TO IS-1239	C
652	FITTINGS FABRICATED FROM PLATE - C.S.	C
653	FITTINGS FABRICATED FROM PLATE - A.S.	B
654	FITTINGS FABRICATED FROM PLATE - S.S.	C
655	FITTINGS FAB. FROM PLATES-EXOTIC MATLS.	B
656	FITTINGS FABRICATED FROM PLATE - CLADDED	B
657	FITTINGS CROSS-FABRICATED FROM PLATES	C
658	FITTINGS PIPE CAP (C S)	C
659	FITTINGS PIPE CAP (A S)	C
660	FITTINGS PIPE CAP (S S)	C
661	FITTINGS PIPE CAP (EXOTIC)	C
662	PIPES-FOREIGN AGENTS/STOCKIST/TRADERS	C
663	PIPE-CARBON STEEL TO INDIAN STANDARDS	C
664	PIPE-WELDED ALLOY STEEL	B
665	PIPE-LEAD	C
666	PIPE-TITANIUM	B
667	PIPES & TUBULARS TO A.P.I.STANDARDS	C
668	PIPE/TUBE-C S (SEAMLESS)TO ASTM STDS	C
669	PIPE-CARBON STEEL(WELDED)TO ASTM STDS	C
670	PIPE/TUBE- A S (SEAMLESS)TO ASTM STDS	C
671	PIPE/TUBE-SS(S.LESS & WELDED)TO ASTM STD	C
672	PIPE/TUBE-S.LESS(DUPLEX/SUPER DUPLEX SS)	B
673	PIPES-SS WELDED TO A 358	C
674	DUPLEX/SUPER DUPLEX SS WELDED PIPES	B
675	PIPES- INDIAN STOCKIST	C
676	PIPE-CLADDED	B
677	VALVE GATE FORGED	C
678	VALVE GATE GUNMETAL/BRASS/BRONZE	C
679	VALVE GATE (MOTOR OPERATED)	C
680	VALVE GLOBE FORGED	C
681	VALVE GLOBE GUNMETAL/BRASS/BRONZE	C
682	VALVE CHECK FORGED	C
683	VALVE CHECK GUNMETAL/BRASS/BRONZE	C
684	VALVE NEEDLE	C
685	FRP/FRP REINFORCED PVC/PP LINED EQPT.	C
686	PVDF/FRP EQUIPMENTS	C
687	LINING (PVC/PE/PP)	C

Sr.No.	Item Description	Item Category
688	LINING (GLASS)	C
689	LINING (LEAD)	C
690	LINING (RUBBER)	c
691	LINING-FRP(TANKS & VESSELS)	c
692	GASKET PTFE CARBON FIBER (REINFORCED)	c
693	GASKET (IMPORTED)	c
694	GASKET NON-ASBESTOS	c
695	GASKET METALLIC & SOFT IRON	c
696	GASKET METAL JACKETED	c
697	GASKET SPIRAL WOUND	c
698	GASKET-PTFE(GLASS FILLED)	c
699	HOSE- RUBBER (STEAM/GAS/AIR/WATER/CHEM.)	c
700	HOSE METALLIC FLEXIBLE SS	c
701	FASTENERS	c
702	FASTENERS:HIGH TEMPERATURE TO A 453	c
703	STRAINERS	c
704	STRAINERS (FAB/CAST/FORGED)	c
705	HEAT EXCHANGER SS-DUPLEX	A
706	HEAT EXCHANGER(PLATES-WELDED)	B
707	HEAT EXCH. MONEL / MONEL CLAD	A
708	HEAT EXCH. NICKEL / NICKEL CLAD	A
709	HEAT EXCH. HASTALLOY / HASTALLOY CLAD	A
710	TUBE - ALUMINIUM FINNED	C
711	LOUVERS FOR AIR fin COOLERS	C
712	PRESSURE VESSEL-CS SITE FABRICATED	A
713	PRESSURE VESSEL-LAS SITE FABRICATED	A
714	PRESSURE VESSEL-SS SITE FABRICATED	A
715	PRESSURE VESSEL-CLAD SITE FABRICATED	A
716	COLUMN-CS SITE FABRICATED	A
717	COLUMN-LAS SITE FABRICATED	A
718	COLUMN-CLAD SITE FABRICATED	A
719	SILENCER	C
720	PRESSURE VESSEL -CS (UP TO 25MM)	C
721	POLYMERISER REACTOR SYSTEM	A
722	PRESSURE VESSEL -CS (26-50MM)	B
723	PRESSURE VESSEL-CS (51-100MM)	B
724	PRESSURE VESSEL-CS (>100MM)	A
725	PRESSURE VESSEL-SS (UP TO 25MM)	B
726	PRESSURE VESSEL-SS (26-50MM)	B
727	PRESURE VESSEL - SS (> 50MM)	B
728	PRESSURE VESSEL -LOW ALLOY STEEL	A
729	PRESSURE VESSEL - LTCS	B
730	PRESURE VESSEL LOW TEMP.3.5% NI STEEL	A
731	PRESSURE VESSEL-CS/LAS+SS CLAD	A
732	PRESSURE VESSEL- TITANIUM	A
733	PRESSURE VESSEL- MONEL	A

Sr.No.	Item Description	Item Category
734	SILOS	B
735	COLUMN/TOWER CARBON STEEL	B
736	COLUMN/TOWER STAINLESS STEEL	B
737	COLUMN/TOWER LOW ALLOY STEEL.	A
738	COLUMN/TOWER LTCS.	B
739	COLUMN/TOWER 3.5 % NI STEEL	A
740	COLUMN/TOWER-CS/LAS+SS CLADDED.	A
741	COLUMN - MONEL CLAD	A
742	COLUMN/TOWER-CS(51-100MM THK)	B
743	HEAT EXCHANGER CARBON STEEL.	B
744	HEAT EXCHANGER STAINLESS STEEL.	B
745	HEAT EXCHANGER LOW ALLOY STEEL.	A
746	HEAT EXCHANGER LTCS.	B
747	HEAT EXCHANGER 3.5 % NI STEEL	A
748	HEAT EXCHANGER-CS/LAS+SS CLAD	A
749	HEAT EXCHANGER TITANIUM/TITANIUM CLAD	A
750	HEAT EXCHANGER (PLATES-GASKETTED)	B
751	HEAT EXCHANGER NF-(BRASS, CU-Ni)	B
752	SAMPLE COOLER.	C
753	REFRACTORY FIRE BRICKS	C
754	REFRACTORY HIGH ALUMINA BRICKS	C
755	ACID RESISTANT BRICKS	C
756	INSULATING BRICKS	C
757	ACID RESISTANT MORTAR	C
758	AIR SETTING MORTAR	C
759	DENSE REFRACTORY CASTABLE	C
760	INSULATING REFRACTORY CASTABLE	C
761	ACID RESISTANT CASTABLE	C
762	CERAMIC FIBRE PRODUCTS	C
763	FLEXIBLE ELASTOMERIC RUBBER	C
764	ROCK WOOL INSULATION PRODUCTS	C
765	GLASS WOOL INSULATION PRODUCTS	C
766	CALCIUM SILICATE PRODUCTS	C
767	PU FOAM & POLYISOCYANURATE FOAM	C
768	EXPANSION JOINTS (RUBBER)	C
769	BOILER-FLUIDISED BED COMBUSTION	C
770	BOILER - INDUSTRIAL WATER TUBE >25TPH	C
771	BOILER- PACKAGE(FIRE TUBE UP TO 25 TPH)	C
772	BOILER - WASTE HEAT (PACKAGE)	C
773	HEAT RECOVERY STEAM GENERATOR	C
774	WASTE HEAT RECOVERY SYSTEM	C
775	BOILER- CO	C
776	CRYOGENIC VAPORIZER-DIRECT STEAM HEATED	C
777	EJECTOR (ENGINEERED)	B
778	EJECTOR (UNENGINEERED)	B
779	VACUUM EJECTOR CONDENSER SYS(ENGINEERED)	B

Sr.No.	Item Description	Item Category
780	VACUUM EJECTOR CONDSR SYS(UNENGINEERED)	B
781	DEMISTER-VANE TYPE	C
782	AIR PRE-HEATER (CAST)	B
783	AIR PRE-HEATER (GLASS TUBE)	B
784	DAMPER(FOR FIRED HEATER/AIR PREHEAT SYS)	C
785	BURNER-CONVENTIONAL	C
786	BURNER-LOW No _x (PROCESS FIRED HEATER)	C
787	BURNER-SRU	C
788	AIR HEATER (DIRECT FIRED)	C
789	CAST PLUG HEADER & PRESSURE FITTINGS	C
790	CASTINGS - TUBE SHEET/TUBE SUPPORT	C
791	REFORMER TUBES(CENTRIFUGAL CAST)	C
792	TUBE-WELDED FIN	C
793	TUBE-STUDDDED	C
794	SOOT BLOWER	C
795	EXPANSION JOINT-(FABRIC)	C
796	CRUDE DESALTER	A

TABLE:2

Activities	Contractor / Supplier	Category A		Category B		Category C	
		TPIA	PMC	TPIA	PMC	TPIA	PMC
ITP Document	Review	Approval required	Approval required	Approval required	Approval required	Approval required	Not required
Providing approved drawings to TPIA/PMC	To Provide	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Stage Inspection	Not Applicable	Approval required	Approval required	Approval required	Not Applicable	Not Applicable	Not Applicable
Final Inspection	Not Applicable	Approval required	Approval required (Refer Note D)	Approval required	Approval required (Refer Note I)	Approval required	Not Applicable
Issue of Inspection certificate	To endorse TPIA's Inspection Certificate.	To Issue	Endorse TPIA's Inspection certificate	To issue	Endorse TPIA's Inspection certificate	To issue	Not Applicable
Distribution of inspection certificate with attachments	To distribute (refer Note2)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Final documents	To submit as per Contract document, after endorsing the certification by TPIA	To certify the Completeness of the documentation as per contract Document.	To forward to Owner after endorsement t	To endorse the completeness of Documentation certified by the Contractor, as per contract document.	To forward to Owner after endorsement	To certify the Completeness of the documentation as per contract document.	To forward to Owner after endorsement

Notes:

1. Will be carried out for critical items, as decided at the time of approval of QAP.
2. Distribution list for Inspection Certificates with attachments
 - a). Project Manager (PMC)
 - b). Inspection Coordinator (PMC)
 - c) Resident Construction Manager (PMC)
 - d) Owner's Representative at Site
 - e) Contractor's Ware-house in-charge
3. Items not covered in Table-1 shall also be categorized in consultation with Owner / PMC.

Notwithstanding the above, PMC / Owner reserve the right to participate in any stage / final inspection.