

LIST 27 (See S.No. 164 of the Table)

1. All types of Refinery Process Units including distillation (CDU, VDU, Condensate Fractionator); thermal cracking (Delayed Coker, Visbreaker, Flexicoker); catalytic cracking (FCC, Hydrocracker); lube processing (Deasphalting, Dewaxing, Solvent Extraction); hydro-desulphurisation/hydrotreating (Naphtha, Diesel, VGO, ARDS, LC Fining, H. Oil); alkylation; isomerisation; catalytic reforming; treating (Merox, Amine); recovery (Propylene, Ethylene, Butane); synthesis (MTBE, TAME); gas concentration plant; bitumen blowing; sour water stripping, extraction (Pentane, Hexane, BTX).
2. All types of Hydrogen Generation, Recovery and Purification Plants; Sulphur Recovery Plants including Tail Gas Treatment Units; with associated components and equipments, including reactors (like shift, Claus, hydrotreater, CBA, desulphurizer), furnaces, steam reformers, waste heat boilers, condensers, Pressure Swing Adsorption (PSA) systems, incinerators, vessels, boilers, pumps, compressors, drivers; alongwith associated instrumentation & control systems and auxiliaries (skidded or otherwise).
3. All types of Utility Systems, including Nitrogen Systems comprising of generation, storage and vaporization plants; Flare Systems comprising of flare tips, stacks, seal drums, knockout drums and pumps; Refrigeration Systems comprising of compressors, refrigerant storage and heat exchangers; Emergency Power Systems comprising of generators, UPS and batteries; with component equipments and all systems auxiliaries, instrumentation & control systems.
4. All types of Process Subsystems, including Continuous Catalyst Regeneration Systems for Reformer; Recovery Plus Systems for Reformer; Power Recovery Train Systems for FCC; Feed Nozzles for FCC, Vapour Recovery Systems; Cryogenic Systems for LPG either supplied separately or as a whole, with component equipments, drivers, instrumentation & control systems, and auxiliaries.
5. All types of Water Handling & Treatment Systems, including sea water intake systems comprising of sea water band screens; Desilting systems for still basin; Sea Water filtration/Chlorination Systems; Desalination plants; Cooling Water Towers; Demineralization plants; Condensate Polishing Systems; Deaerators and Potable Water Systems; and all component equipments, vessels, pumps, vapourisers, condensers, filters, eductors, heat exchangers, drivers, screens, framing structures, gates, instrumentation & control systems, activated carbons, ion exchange resins, resin traps, additive injection systems and auxiliaries, (skidded or otherwise)
6. All types of Effluent Solids/Liquids/Gaseous Processing, Handling, Control, Abatement and Disposal Systems, including plate interceptors, dissolved air floatation devices, skimmers, hydrocyclones, clarifiers, chemical dosing systems, acid treatment and biological treatment systems; Spent Caustic Neutralisation Systems and Sewage Filtration/Treatment Systems; with component equipments, instrumentation & control systems.
7. All types of Air Handling Systems and Equipments, including plant/instrument air compressors, FD/ID fans, blowers, dehumidifiers, pneumatic systems, mixers, dryers, intake filters, vents, silencers, cyclones, stacks, manifolds, ducts; with drivers, auxiliary seal/lube/control oil systems, instrumentation & control systems.
8. All types of Fired Heaters and Boilers, with radiant coils and sections, transfer line assemblies, convection coils and sections, cross over/jump over pipes, fittings, tube sheets, tube supports, refractory materials, structural steel supports, casings, stacks, dampers, soot blowers, ducting systems, gas/oil/dual burner assemblies, burner tiles, waste heat boilers (WHB), steam generators, economizers, air/fuel preheat systems, FD/ID fans, fuel gas/oil skids; and including LPG vaporizers, steam superheaters, heat recovery steam generators, electric heaters, FCC flue gas coolers, steam reformers, CO boilers, circulating fluidised bed boiler, auxiliary boilers, process interheaters, thermal reactors, thermal incinerators, coke feeders, limestone feeders, ESP/baghouse filters; alongwith associated instrumentation & control systems, including burner lighting, flame detection and burner management systems.
9. All types of Compressors, including axial, centrifugal, diaphragm, reciprocating, rotary screw and sliding vane type compressors; for gas, air, hydrocarbon and all special services including FCC Power Recovery Trains (PRT); LPG vapour return blowers; with drivers of motor or steam turbine or expansion turbine or engine or gas turbine or hydraulic turbine types; speed governor systems, seal/lube/control oil systems (skidded or otherwise), gear assembly,

bearings, barring gears, clutch, couplings, intercoolers, after coolers, suction filters; instrumentation & control systems including vibration monitoring anti surge control, inlet guide vane control, sequencer control, control panel and machine condition monitoring systems.

10. All types of Heat Exchangers, including shell and tube, double pipe, kettle, plate welded plate, high pressure (breech lock), Armstrong and brazed types; with plain or fin or High Flux or U tubes for cooling intercooling, trim cooling, chilling, condensing, crystallizing, heating, vaporizing or reboiling services; with tubes, tube sheets, head assemblies, shells, flanges, bolts & nuts, gaskets, baffles, tie rods; instrumentation and control systems.

11. All types of Air Cooled Exchangers, for cooling, intercooling, trim cooling, chilling and condensing services; with plain/finned tubes, of carbon steel, admiralty brass, alloy steel, stainless steel; monel or titanium or other materials; with fans, fan drivers, structural steel support frameworks, instrumentation and control systems, anti vibration systems.

12. All types of Agitators and Mixers, including static, jet, dilution types; motor drivers, aeration systems; with instrumentation & control systems.

13. All types of Filters, Screens & Strainers; including backwash, bucket, carbon, cartridge, duplex, pressure / mechanical, rotary, drum, sand, sock/bag, vacuum types, and special FCC net bottoms catalyst filters; screens, strainers, demisters and sea water clarifiers; with instrumentation & control systems.

14. All types of Vacuum Producing Equipments, including ejectors, educators, venturies; with instrumentation & control systems.

15. All types of Materials Separation systems, including cyclones, centrifuges, coalescers, dust collectors, electrostatic precipitators, oily water separators, flocculators; and specialized systems of Crude Oil Desalters, Reactor Cyclones and Regenrator Cyclones for FCC, third Stage Separators and Fourth Stage Cyclone Separators for FCC; with vessel internals, grids, distributors, supports, instrumentation & control systems.

16. All types of Materials Transporting Equipments, including loading & unloading arms and racks; gantries, dispatch tanks, loading / transfer pumps, hydraulic systems, weigh bridges, Diesel shunters, feed or injection or spray nozzles, skimmers, soot blowers; with instrumentation & control systems, including load cells and metering stations.

17. All types of Electrical Equipments including switchyard equipments, transmitters, relays; solar power systems, including solar panels, batteries and charger; phase shift monitors, motor or steam turbine generators, protection relays for generators, auxiliary seal/lube/control oil systems; actuators, annunciators, lighting masts, lighting fittings, panels; batteries and battery chargers; bus ducts; all types of cables including power/instrument/compensating/fibre optic/coaxial/control cables; cable joints, capacitors, distribution boards, fittings, substations, grounding/neutral resistors; heat tracing systems including insulation; microprocessor based process controllers; local control stations, motor control centres, power control centres, HT/LT motors, shock eliminators, HT/LT switch gears, transducers, HT/LT transformers, UPS and variable speed drivers over current protection devices, instrumentation and control systems including load distribution and management systems and auxiliaries, (skidded or otherwise).

18. All types of Materials Handling Equipments including belt or pneumatic conveyors, ducts, hoists, bucket or jib cranes, (with or without gangways), pipe and hoses, funnels, hoppers, disengaging lock hoppers, catalyst addition pots, valves and sampler devices; bagging, weighing and bag stitching systems; weigh bridges; buoy systems for crude oil receipt; pipeline and manifolds with valves, fenders, mooring aids, laser docking systems, product tanker loading facilities; with associated equipments, instrumentation and control systems, and auxiliaries.

19. All types of coke handling and storage equipments, including coke crushers, coke cutting systems, coke drum unheading devices, coke drum switching systems, coke conveyors, stackers and reclaimers, silos/hoppers, dust abatement systems, belt weighers; Sulfur Handling and Storage Equipments and Sulphur Granulation or Flaking or Prilling Systems with associated equipments, instrumentation and control systems and auxiliaries.

20. All types of Product Filling Systems, including LPG bottles filling machines and bitumen drum filling machines; and associated equipments, instrumentation and control systems and auxiliaries.

21. All types of injections and Dosing Packages, for Injection or metering or dosing of chemicals, additives, inhibitors, odourisers, oxygen scavengers, biocides, chlorine, polymers, caustic, acids, emulsifiers, antifoams or antifoulants, with their component equipments, like drums, tanks, pumps; instrumentation and control systems, auxiliaries (skidded or otherwise).

22. All types of Pumps, including API or non-API; centrifugal, diaphragm, in-line, jockey, vertical, booster, barrel, gear, Sundyne, screw, ram, reciprocating or submersible types; single stage or multistage types; for petroleum crude or intermediate products or petroleum products and byproducts; water including sea water and boiler feed water; chemicals, slops or sludge services; liquid booster for LPG (cryogenic); with motor or steam turbine or hydraulic turbine or diesel engine drivers; and instrumentation and control systems, auxiliaries, including seals flushes, gear boxes, water cooling harnesses and lube oil consoles.

23. All types of Tanks and Storages, including plate materials, flanges, fasteners, nozzles, fittings and other components for assembly/construction/erection at site; and instrumentations, including relief, breather, and rim vent valves; nitrogen blanketing systems, roof drain pipings, rim seals, flame arrestors and automatic tank gauging systems; for oil, hydrocarbon (petroleum crude, products, byproducts, intermediate and blend components), water, chemicals, slops, sludge storage in either cone, fixed, floating, dome or internal floating roof configurations; solids storage in silos, bins or hoppers and LPG/propylene/ethylene/propane/butane storage in spheres, bullets or cryogenic tanks; and instrumentation and control systems.

24. All types of Columns, either supplied separately or together; comprising of grids, screens, distributors, nozzles and their supports/fasteners and accessories; for services like absorption, desorption, stripping, fractionation, distillation, splitting, stabilization, extraction, washing or scrubbing services; and column internals comprising of trays either bubble, jet, multi downcorner (MD), sieve or valve trays; or either random or structured type packings; and their appurtenances, instrumentation and auxiliaries.

25. All types of Vessels and Drums, either supplied separately or together, comprising of shells, heads, internals, grids, screens, demisters, coalescers, boots, distributors, packing and their supports/fasteners and accessories, for storage, separation, reaction, mixing, decoking, degassing, flashing, draining, blow down, desuperheating, drying, sealing, receiving, surge and interface controlling services; and their appurtenances, instrumentation, insulation and auxiliaries.

26. All types of Reactors, either supplied separately or together, comprising of shells, heads, catalysts, support materials, grids, screens, demisters, coalescers, distributors, packings and supports/fasteners and accessories; for carrying out cracking (FCC Reactor and Spent Catalyst Stripper), coking (Coke Drums), visbreaking, hydrotreating, hydrodesulphurization, hydrocracking, catalytic reforming (Platformer), shift, sulphur (Claus), adsorption (CBA, PSA), oxidizing, treating (Merox), regenerating (FCC Regenerator/Combustor), desulphurising reactions; spray and mixing nozzles and their appurtenances, instrumentation and auxiliaries.

27. all types of Instrumentations, including various types of level/pressure/density/temperature/flow instruments, detectors, level/pressure/draft/temperature gauges, capacitance/level/limit, proximity switches, transmitters, annunciators, controllers, converters, transducers, temperature sensor assemblies, load cells, orifice assemblies, rotameters, pitot tubes, venturies, meter runs, control/metering panels, pneumatic/motorised/hydraulic/piston actuators, recorders, solenoid operated valves, transmitters, thermocouples, temperature elements, sight glasses, amplifiers, annubars, barriers / isolators, all types of flow meters, custody transfer meters, meter provers, density meters, electromechanical/magnetic/nuclear/radar/ultrasonic level indicators, weighing and bagging systems and test equipments for testing and calibration of above instruments.

28. All types of Transmitters and Monitors, including electronic transmitters for measurement of level, pressure, flow speed, temperature and weight; and monitoring systems for ambient air, fugitive emissions, pipelines, speed, stack emissions and vibration.

29. All types of Control Equipments, including ball/butterfly/gate/globe/needle/plug/bellow sealed type control valves; shutdown valves, self actuating, solenoid, on/off, fast acting quarter turn, pressure regulating, breather and pressure/vacuum relief valves; pilot operated safety valves, and valves for specialised services, such as catalyst

addition systems and lock hopper control systems.

30. All types of Control Hardware and Software Systems, including Distributed Control Systems (DCS), Emergency Shutdown Systems (ESD), Programmable Logic Controllers (PLC), Security & Access Systems, Terminal Automation Systems, Advanced Process Control (APC) Systems with Real Time Optimizer (RTO), Supervisory Control and Data Acquisition (SCADA) Systems, and Refinery Information Management System (RIMS) with operator panels, computers, data loggers, interfaces, relay cabinets, engineering controls, large display screens, microwave transmission and receiver equipments, logic multipoint recorder/multiplexers, and their hardware and software.

31. All types of Fire & Gas Detection Systems, consisting of LEL/fire/smoke/UV/gas/IR/toxic detectors; panels, cables, weather protection housing, junction boxes, detector cards, cabinets, calibration equipments, beacons and lights, and their hardware, and software.

32. All types of Pipes, Tubes and Hoses, including clad, coated, lined; made of carbon steel, low temperature carbon steel, alloy steel, stainless steel, GRP, copper, aluminium HDPE, PP, fibre glass, monel incolloy, titanium or any other materials; and other in seamless or welded construction; for all applications fields joint coating materials; with instrumentation and control systems like pipeline surge relief systems; auxiliaries, painting and insulation.

33. All types of Pipe Fittings, including elbows, connectors, tees, pipe fabrication accessories, spargers, nozzles, plugs, packing glands, rings, flanges, gaskets, supports, pads, manifolds, siphons, shock absorbers, struts, fasteners; mitre/long radius/short radius bends; sockolets, weldolets, spray nozzles, graylock fittings; swagelock/compression fittings; insulating kits, special steam traps, liquid float traps, bellows, flexible hoses, couplings, vent silencers; and speciality items like Teflon sliders, standpipe expansion joints, spring supports/hangers, scraper tees; pipeline and manifolds with valves; cleaning/scraping/monitoring pigs; pig launcher, pig receiver and pig detection system; cathodic protection system with sacrificial anodes and CP monitoring system; with instrumentation and auxiliaries.

34. All types of valves, including ball, butterfly, check, diaphragm, gate, double disc or knife gate, globe bellow sealed globe, jacketed, plug, through conduit type valves; with manual/gear/motor/hydraulic operations; for oil, water, steam, hydrocarbon, chemical, cryogenic, subsea, nitrogen blanketing and thermic fluid services; and specialised services valves, like FCC butterfly valves, Cooker switch valves, standpipe slide valves, flue gas divertor valves, pressure reducing station systems, pipeline and manifolds and riser tie-in manifolds.

35. All types of Gaskets and fasteners, including anchor/foundation/structural bolts; flanges, studs, nuts, washers; and metallic/soft/spiral wound gaskets and O-rings.

36. all types of Structural Steels, Materials and Plates including carbon steel/LT carbon steel/alloy steel/stainless steel plates; bars, rolled sections, tubular sections, HYSD bars, dampers, prefabricated trestles, pipe bridges with pre-installed pipes, loading platforms, steel A frames, blast proof doors; steel tubulars, seamless & welded; special steel piles; dolphins; low, medium & high strength steel, fasteners; and special application refractory/copalite/sulphide resistant quick setting cements.

37. All types of ferrous or non-ferrous prefabricated/semi fabricated, Plant Structures, including pipe racks, supporting frames, trestles, pipe bridges with pipes pre-installed and pre-insulated.

38. All types of Analyzers, either on-line or off line; for measurement of H₂S, Oxygen, NO_x, SO_x, CO₂, CO, hydrocarbon, dew point, density, conductivity, pH, combustible gases, oil in water, vapour pressure, silica, sodium, distillation, flash point, moisture, viscosity and smoke point; and analyzer sampling systems/cubicles; analyzer houses with sample conditioning systems, sample probes/sensors, tubings, HAVC systems, calibration gases cylinders and Dräger tubes.

39. All types of Laboratory Equipments, including sampling, quality control and analytical equipments for testing and measurement of various petroleum crude/products/by products quality parameters; and including sample collection equipments, gas/ion chromatograph, CFR engines for octane & cetane number, pulse NMR, spectrophotometers of different types, distillation equipment systems, analyzer management systems and laboratory information management systems; with instrumentation, auxiliaries, hardware and software.

40. All types of Safety and Fire Fighting Equipments, for safety of personnel and plant & machinery including fire suits, fire monitors, Q.B. bulbs, spray nozzles, ambient air monitors, heat and flame resistant clothings, portable extinguishers, deluge skid systems, explosimeters, rupture discs, fire fighting systems, fire tenders; foam systems with foam storage and monitor, transport and booms; snorkels, sprinkler systems, breathing air apparatus; fire proofing materials for passive fire protection of steel structures and oil spill protection booms, with auxiliaries.

41. All types of Communication Equipments, including cables, bone mikes, frequency synthesizers, meteorological instruments; microwave transmission and received equipments, public address systems, intrinsically safe walkie-talkies, UHF/VHF multi channel communication systems, radio telemetry systems, with remote telemetry units, portable units and PC based master telemetry units and antenna systems.

42. Initial charge of all types of catalysts, deslocants, zeolites, activated carbons, clay molecular sieves, used in refining and processing of petroleum crude, petroleum products and by-products.

43. Software Support Systems, including training simulation systems, electronic documentation systems, CAD stations, data tapes; operation/maintenance/safety manuals; scanners, plotters, printers; software including licenses; specifications, drawings, technical literature, and their hardware and software.

44. Special Maintenance Systems, including hydrojetting tools, pneumatic torque wrenches; EOT/mobile cranes; hoists, grinders, high pressure cleaning systems, induction bending machines; auto welding machines, various welding equipments like girth welding, vertical flux cord, bottom saw, four side edge preparation, angle rolls; rolling and levelling machines, sky climbers, hot tapping machines, bolt tensioners, high pressure test pumps, tube bundles pullers, tube nippers, ultrasonic leak detectors, machine condition monitoring systems and associated subassemblies; vibration analysers and computerized alignments systems.

45. Sub-assemblies, tools, accessories, protective coating/paint materials, stores, spares, materials, supplies, consumables for running, repairing of maintenance of the goods specified in this List.