An ISO 9001
Company

Bharat Heavy Electricals Limited
(High Pressure Boiler Plant**)**
Tiruchirappalli – 620014, TAMIL NADU, INDIA
MATERIALS MANAGEMENT

ENQUIRY FOR ELEVATORS	Phone: +91 **431 2577405/2577731** Fax : **+91 431 252 0719** Email : **bsunder@bheltry.co.in**

	Reference Number: Enquiry 1701100796-18	**Enquiry Date:** 01.09.2011	**Due date for submission of quotation:** 22.10.2011
You are requested to quote the Enquiry number date and due date in all your correspondences. This is only a request for quotation and not an order			

BHEL/Trichy is looking for empanelment of new vendors (manufacturers only) for supply, erection and commissioning of "PASSENGER CUM GOODS ELEVATORS FOR THERMAL POWER PROJECT IN TISHREEN, SYRIA"

BHEL commercial terms & conditions with Price Bid formats and all annexure can be downloaded from BHEL web site http://www.bhel.com or from the Government tender website http://tenders.gov.in (public sector units) Bharat Heavy Electricals Limited under enquiry reference "1701100796-18 "	
Tenders should reach us before 14:00 hours on the due date Technical bid will be opened at 14:30 hours on the due date Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present.	Yours faithfully, For **Bharat Heavy Electricals Limited** MANAGER / MM / FOSSIL BOILERS

BHARAT HEAVY ELECTRICALS LIMITED

ENQUIRY
(INDIGENOUS)

(A Government of India Undertaking)
HIGH PRESSURE BOILER PLANT
PURCHASE DEPARTMENT - FOSSIL BOILERS
THIRUCHIRAPALLI - 620014
TAMILNADU (INDIA)

PHONE : 2577731
GRAMS : BHARATELEC
FAX NO: 2520719
E-mail :
Web :

429-002/A

OFFICE COPY

Collective No.	Enquiry Date	Due Date For Quotation
1701100796-18	01.09.2011	22.10.2011

Please quote Enquiry No, Date and due date in all correspondences.
This is only a request for quotation and not an order

Item	Description	Unit	Quantity	Delivery Quantity	Schedule Date
10	L120819759301001 PASSENGER CUM GOODS ELEVATOR - CAPACITY: 1000 kg; SPEED: 0.55 m/sec AS PER SPECIFICATION : TDC:TCI:263:TISH/REV.01 AND PACKING PROCEDURE : QA:CI:STD:PR:02/Rev02.	NO	2.000	2.00	24.03.12

General Note:

REMARKS :

1. THE SCOPE OF THIS ENQUIRY COVERS " DESIGN, ENGINEERING, MANUFACTURE, INSPECTION, TESTING AND DELIVERY TO SITE AND ERECTION, COMMISSIONING AND HANDING OVER TO CUSTOMER AT SITE FOR THE PASSENGER CUM GOODS ELEVATOR FOR FOSSIL FUEL FIRED THERMAL POWER PLANT BOILER AREA AT THE LOCATION TISHREEN IN THE COUNTRY OF SYRIA AS PER THE SPECIFICATION NO. TDC:TCI:263:TISH/REV01 ENCLOSED."

2. QUALITY PLAN FROM VENDOR SHALL BE SUBMITTED ALONG WITH THE OFFER FOR BHEL REVIEW. THE SAME WILL BE SUBJECT TO BHEL/CUSTOMER APPROVAL AFTER PLACEMENT OF PURCHASE ORDER.

3. VENDOR SHALL INDICATE ANY EXTRA REQUIREMENTS WHICH NEEDS TO BE TAKEN CARE BY BHEL FOR ELEVATOR DUE TO THE EXTANT STATUTORY REQUIREMENTS AT SYRIA OR RELEVANT ELEVATOR STANDARDS. ANY REQUIREMENTS WHICH BHEL NEEDS TO INCORPORATE IN BOILER ALSO SHALL BE HIGHLIGHTED IN THE TECHNICAL OFFER.

NOTE :

1. ANY CLARIFICATION REQUIRED REGARDING THE SCOPE OF ELEVATOR INCLUDING SUPPLY /ERECTION/ COMMISSIONING/ MAINTENANCE SHALL BE REQUESTED BY VENDORS DURING OFFER STAGE ITSELF. ANY QUERY / DISPUTES AFTER FIRM ORDER SHALL NOT BE ENTERTAINED

2. OFFER SHALL BE FORWARDED IN TWO PART BID. TECHNICAL WITH COMMERCIAL TERMS IN ONE PART AND PRICE BID IN OTHER PART IN A SEALED COVER SHALL BE FORWARDED.

Enclosures:

The offers should reach us 30 minutes before the time of opening of tenders.
The offers will be opened at 14.30 hrs on the due date of tender in the presence of tenderers who have submitted their offer and who may like to be present for the tender opening.Late and delayed offers are liable to be rejected.

Yours faithfully,
For **BHARAT HEAVY ELECTRICALS LIMITED**

02/Sep/11

MANAGER / PURCHASE
(FOSSIL BOILERS)

BHARAT HEAVY ELECTRICALS LIMITED

(A Government of India Undertaking)
HIGH PRESSURE BOILER PLANT
PURCHASE DEPARTMENT - FOSSIL BOILERS
THIRUCHIRAPALLI - 620014
TAMILNADU (INDIA)

17011007961 8/ 01.09.2011 11982

1. THE SPECIFICATION TDC:TCI:263:TISH/REV.01
2. PACKING PROCEDURE: QA:CI:STD:PR:02/Rev02

"LD clause has to be confirmed without fail."
"Payment to vendors will be made only thro E-Payment mode."

PR Links

Material.	PR.No	PR.Item.	Quanity	Acc. Assign	Customer Number
L120819759301001	63002558	00010	1.000	U2/1208-SY-475-1-97-593	U2/1208
L120819759301001	64435977	00010	1.000	U2/1209-SY-475-1-97-593	U2/1209

list of suppliers

RFQ-5400013533
KONE ELEVATOR INDIA PVT.LTD.,
SOUTHERN REGIONAL OFFICE
IV TH FLOOR, KRD GEE GEE CRYSTAL
NO.89-92,DR.RADHAKRISHNAN SALAI
CHENNAI
PIN- 600004

RFQ-5400013534
OTIS ELEVATOR CO (I) LTD.
97 SREE LAKSHMI TOWERS, 2ND FLOOR
257 METTUPALAYAM ROAD
COIMBATORE
PIN- 641043

The offers should reach us 30 minutes before the time of opening of tenders.
The offers will be opened at 14.30 hrs on the due date of tender in the presence of tenderers who have submitted their offer and who may like to be present for the tender opening.Late and delayed offers are liable to be rejected.

Yours faithfully,
For **BHARAT HEAVY ELECTRICALS LIMITED**

02/Sep/11

MANAGER / PURCHASE
(FOSSIL BOILERS)
Yours faithfully,

Bharat Heavy Electricals Limited

HIGH PRESSURE BOILER PLANT, TIRUCHIRAPALLI-620014.

TECHNICAL DELIVERY CONDITIONS

FOR SUB-DELIVERY COMPONENTS

CONTROLS & INSTRUMENTATION / FB

SPECIFICATION FOR PASSENGER CUM GOODS ELEVATOR

Reference: TDC:TCI:263:TISH / REV.01
Sheet: 01 of 20

PEEGT- MINISTRY OF ELECTRICITY, SYRIAN ARAB REPUBLIC
2X200MW, TISHREEN THERMAL POWER PLANT
EXTENSION PROJECT

CUSTOMER NUMBERS : 1208 & 1209

REV. NO	DATE	DESCRIPTION	PREPARED SKS	CHECKED RD	APPROVED RD
00	22/02/2011	INITIAL RELEASE	Sd./SKS	Sd./RD	Sd./RD
01	19/08/2011	GENERAL REVISION			

SPECIFICATION FOR PASSENGER CUM GOODS ELEVATOR

01.00.00 **SITE CONDITIONS**

01.00.01	Altitude above MSL	: 380m
01.00.02	Relative humidity	: 56%
01.00.03	Design Ambient Temp.	: (-)11ºC to (+)45º C
01.00.04	Seismic Loads	: Seismic coefficient UBC Zone 3
01.00.05	Wind velocity	: 35 m / sec
01.00.06	Plant Elevation	: 606m
01.00.07	Barometric Pressure	: 920 mbar
01.00.07	Country name & location	: Tishreen, Syria.
01.00.08	Surrounding	: Dusty and corrosive

02.00.00 GENERAL:

This specification is intended to cover the **design, engineering, manufacture, inspection, testing and delivery** to site and **erection, commissioning and handing over** to customer at site for the Passenger cum Goods Elevator for fossil fuel fired thermal power plants Boiler area. Boiler area is expected to be dusty and corrosive. **Vendor shall ensure accurate, reliable and trouble-free operation in corrosive and dusty conditions and environments that are found in fossil-fired power stations**

02.01.00 QUALIFYING CRITERIA

The elevator offered shall have proven for similar applications in fossil fuel fired power plants of similar or higher sizes. Vendor shall submit a list of references of plants (for power boilers with elevator capacity, landings and travel as per enquiry or more) where the offered system is in satisfactory operation for more than one year.

03.00.00 DRAWINGS / DOCUMENTS

The following preliminary documents/drawings should be submitted by the vendor along with the offer

03.00.01 Detailed description of the elevator offered.

03.00.01 Proven experience details for the system offered.

03.00.03 Write-up on interlocks, controls and safety devices provided.

03.00.04 General Arrangement drawing of Elevator (including hoist way, pit well etc.)

03.00.05 General Arrangement of machine room and equipment in machine room.

i. Electrical control scheme with legend and write-up.

ii. Machine room Air-Conditioning details.

iii. Foundation and loading details of machine room floor and the concrete structure.

iv. Pit details for civil foundation and loading details.

v. Manufacturing schedule.

vi. Filled in vendor data sheet for Elevator and motor.

03.00.06 Filled in vendor quality plan.

03.00.07 Head room required above maximum landing level up to the machine room and head room for machine room.

03.00.08 Block diagram showing detailed scope division of work for civil / structural/ electrical items between BHEL and elevator vendor as per clause 06.00.00 & 07.00.00 of this specification.

03.00.09 The signed "Sub-delivery Enquiry Deviation Format" shall be sent along with the offer and BHEL will evaluate the offer only upon receipt of the same. Any deviations / clarifications from enquiry documents shall be clearly highlighted in the said format. No deviations, unless taken up in the enquiry stage itself by vendor and accepted by BHEL, will be reviewed by BHEL after firm order.

03.00.10 The make, type, capacity, range of all bought out items to be furnished by the vendor along with the offer.

03.00.11 The major components of lift with weight details to be indicated by the vendor in the offer itself.

04.00.00 GUARANTEE

The Elevator Vendor shall guarantee that the materials, workmanship and performance of the apparatus installed under this specification is perfect in every respect and that they will make good of any defects (not due to careless operation) which may develop within 18 months from the date of formal handing over of the equipment after erection / commissioning at site.

05.00.00 **MAINTENANCE**

After the completion of the installation, the vendor shall provide maintenance and service for the equipment furnished under this specification for a period of eighteen months. This service shall include monthly inspections of the installation during regular working hours by trained employees and shall include all necessary adjustments, greasing, oiling, cleaning, supply of genuine standard parts to keep the equipment in proper operation except any part made necessary by misuse, accidents or negligence caused by others.

05.00.00 **STATUTORY REQUIREMENTS**

All registration and statutory inspection fees if any, in respect of his work pursuant to this contract shall be to the account of the elevator vendor. However any registration, statutory inspection fees lawfully payable under the provision of any statutory laws and its amendments from time to time, during erection in respect of the plant equipment ultimately to be owned by owner shall be to the account of the owner. Should any such inspection or registration need to be re-arranged due to the fault of the vendor or his sub-contractor, the additional fees for such inspection and / or registration shall be borne by the vendor. While the statutory payment shall be made by the owner for any registration, statutory inspection etc. during erection, the vendor shall be responsible for carrying out and co-ordinating various activities with the statutory authority as well as for obtaining the clearance and registration of the equipment.

06.00.00 **SCOPE OF WORK:**

06.00.01 Design, engineering, manufacture, inspection, testing, delivery, erection, site testing, commissioning, and maintenance & services **during guarantee period** as per relevant BS / DIN / Syrian Arab Republic standards.

06.00.02 Necessary chain and pulley block, hoist, rope and hook arrangements at the machine room ceiling to carry out the maintenance and erection of equipment shall be supplied by Elevator vendor. These equipments shall be handed over to owner after completion of commissioning. The necessary mono-rail beam will be supplied by purchaser (BHEL).

06.00.03 A steel ladder has to be provided for access to the pit by the Elevator vendor. Any necessary erection / commissioning spares and consumables shall be included in vendor scope. Necessary tools and tackles required for maintenance or testing or inspection shall be covered in vendor scope.

06.00.04 Guard to protect the hoist way including temporary barricades at hoist way openings.

06.00.05 Scaffolding as per erection requirement shall be provided by the Elevator vendor. After completion of handing over activities, the scaffolding materials are to be taken by the vendor. Suitable provision to be made by vendor accordingly.

06.00.06 All the electrical equipment including Lift well, Hoist way & machine room lighting with fittings, Power/control/trailing cables, switch-Disconnector for 380VAC, 3 phase supply and 240 V AC single phase supply (to receive the incoming feeders provided by BHEL-PEM) shall be included in the Elevator vendor scope.

06.00.07 Machine room structures to support all overhead machinery as per clause number 14.00.14.

06.00.08 Any other equipments/ structures which are necessary for satisfactory performance of elevator shall be included by vendor in the offer itself. The same may be highlighted in the offer.

07.00.00 **EXCLUSIONS**:

Works not included in Elevator contract, but furnished by others in accordance with local codes and regulations and the approved drawings of the Elevator vendor.

07.01.00 Civil works associated with the Elevator pit.

07.02.00 Furnishing and installation of steel beams (Hoisting beam) in the machine room, to lift equipment during installation and to facilitate maintenance.

07.03.00 Machine room civil works including concrete flooring.

07.04.00 Steel structures for Columns (LC1, LC2, LC3 & LC4 in the enclosed drawing in sheet no: 20 of this specification) and associated bracings and approach platforms up to landing doors at each level.

07.05.00 Supporting steel material between hoist way & car will be provided.

08.00.00 **TERMINAL POINTS**

08.01.00 380VAC & 240VAC power supply: Power supply cables for elevator will be terminated by BHEL up to the Junction boxes arranged by vendor as per clause 10.00.00.

09.00.00 **AUTOMATIC TERMINAL STOPS:**

The Elevator shall be equipped with an automatic stopping device arrangement to bring the car to a stop at the terminal landings independent of the regular operating device in the car. Final limit switches shall be provided in the hoist way, operated by the car and arranged to stop the car and prevent normal operation, should it travel beyond the zone of the normal stopping device.

Elevator shall be suitable for continuous 24 hours round the clock operation.

10.00.00 **POWER SUPPLY:**

One three phase 380V, AC, 50 Hz, and one single phase 240V, AC, 50Hz supply feeders will be provided in the machine room by BHEL.

The junction box having MCCB/MCB/RCCBs of adequate rating shall be arranged by the vendor to receive the above supplies. The Elevator vendor shall also indicate the proposed location of junction box in the machine room. All further cabling and wiring from the junction box shall be carried out by the Elevator vendor.

Further the Elevator vendor shall tap the supply with necessary MCCB /MCB/RCCB units and distribute the power supply to the Elevator equipment and hoist way lighting.

a.	Lift operation	380V, 3 phase, 50 Hz 3 wire supply
	Variation in	i. Voltage : ± 10 % ii. Frequency : ± 5 %
b.	Lighting and fan	240 V, single phase, 50 Hz supply
	Variation in	i. Voltage : ± 10 % ii. Frequency : ± 5 %

The vendor shall arrange to tap power supply required for constructional purposes from the point terminated by the owner. **The exact Power requirement of 3 phase supply and single phase power supply shall be indicated in the offer.**

NOTE:
Vendor has to note the Power Supply provision made by us as below. Any change required shall be intimated in offer stage itself in writing.

I. 3 Ph, 3Wire 380 V, 50 Hz AC :
(Max. 3 Ph Power shall be 30 kVA)

II. 1 Ph, 240 V, 50 Hz, AC :
a) Lighting for Hoist way, Car & Machine Room:
b) A/C Machine :
(Max. 1 Ph Power shall be 10 kVA)

11.00.00 **DETAILS OF SPECIAL TREATMENT FOR ELEVATOR**

As the Elevators are to be installed in a dusty and corrosive area in a thermal power station, the Elevator components shall be given special corrosion treatment as indicated below.

Item number	Description	Special Treatment
11.00.01	Cars & Counter weight	Anti-corrosive epoxy paint
11.00.02	Fish plates	Anti-corrosive epoxy paint
11.00.03	Car & Counter weight buffer	Anti-corrosive epoxy paint

11.00.04	Supports(Buffer)	Anti-corrosive epoxy paint
11.00.05	Rail Brackets	Anti-corrosive epoxy paint
11.00.06	Bracket & rail fasteners	Zinc-passivated with epoxy painted
11.00.07	Tie down bolts	Zinc-passivated with epoxy painted
11.00.08	Machine	Anti-corrosive epoxy paint
11.00.09	Brake adjusting screw & coupling fasteners	Zinc-passivated
11.00.10	Bracket	Anti-corrosive epoxy paint
11.00.11	Controller cabinet	Anti-corrosive epoxy paint as per industry standard.
11.00.12	Hall buttons	Dust-proof with aluminium face plate or stainless steel hardware.
11.00.13	Car operating panel	Dust proof stainless steel plate and hardware.
11.00.14	Governor	Cover and casting epoxy painted. Other components zinc plated.
11.00.15	Governor Tension frame	Hot dip galvanised and anti-corrosive epoxy paint with M.S. shaft for sheave.
11.00.16	Car frame, level brace rods and counter weight frame	Epoxy paint as per relevant BS / DIN / Republic of Syrian Arab Standards
11.00.17	Safety equipment (Linkages)	Zinc-plated
11.00.18	Safety switch and car gate switch	IP-65. Dust proof heavily zinc plated arm, stainless steel shaft and housing as per vendor standard.
11.00.19	Guide shoe	Zinc-plated
11.00.20	Cam bar mountings and channels	Zinc-plated and anti-corrosive epoxy paint
11.00.21	Counter weight frame	Anti-corrosive epoxy paint
11.00.22	Guide shoe with Nylon ribs	Zinc-plated

11.00.23	Filter weights	Anti-corrosive epoxy paint
11.00.24	Rope fasteners	Zinc-passivated and chromate dipped
11.00.25	Hoist rope	Greased after galvanising
11.00.26	Governor rope	Greased after galvanising
11.00.27	Car enclosure, interior gate, car door and landing door	Anti-corrosive two coats baked enamel paint
11.00.28	Alarm and door open bells (Electronic hooter)	Painted.
11.00.29	Junction box	Metallic body - dust proof with Anti-corrosive epoxy paint
11.00.30	Hall position indicator and car position indicator	Dust proof with stainless steel enclosure and Face plate.

The Lift shall be designed, erected and commissioned to meet all the latest applicable requirements of all local Lift acts and rules (Syrian Arab Republic)

12.00.00 **MACHINE ROOM Air conditioning:** Machine room shall be provided with air conditioners to make the machine room dust proof. Minimum capacity of elevator shall be limited to 5 tons. If higher capacity of A/C is required for proper cooling, the same to be indicated in the offer and provided. Vendor to indicate the power consumption of A/C units.
Machine room less elevator also can be offered, if it is of proven design.

13.00.00 **ELEVATOR PARTICULARS & DESIGN PARAMETERS**

13.00.01 Elevator shall be provided with 1 number fireman's switch (Alarm Switch) located at ground level.

13.00.02 The Lift shall be located on the side of the boiler as indicated in the layout drawing enclosed.

13.01.01 The Lift shall be designed in line with the recommendation contained in the latest editions of applicable **BS/DIN/Applicable standard in Syrian Arab Republic)** – 'Specification of Electric Passenger and Goods Lifts', 'Codes of practice for Installation, Operation, Maintenance of Electric Passenger and Goods Lifts' and 'Outline Dimensions of Electric Lifts' and European standard for elevators such as **EN81** (all applicable sections for boiler elevator).

13.02.00 **Design Criteria and Equipment specification for passenger cum goods Elevator**.

13.02.01	Type of service	Passenger cum Goods Elevator At Boiler area
13.02.02	Number required	**2.00 Numbers. —** **1 Number for boiler 1 and** **1 number for boiler 2.**
13.02.03	Elevator capacity	**1000 Kg.**
13.02.04	Rated speed	**0.55 METER PER SECOND**
13.02.05	Total travel	**55.650m.**
13.02.06	Number of floors to be served	**Five Floors**
13.02.07	Entrances	**One number in each floor**
13.02.08	Entrances and Platform size	**As per BS/DIN/EN81 (latest revisions) & other applicable in Republic of Syrian Arab standards for elevator.**
13.02.09	**Landing levels: floor to be served**	**0.150m; 13.600m; 33.800m; 45.800m; 55.800m.**
13.02.10	Drive Motor	**As per IEC 60034.**
13.02.11.	Method of control	**Motor Speed Control:** Microprocessor based Variable Voltage variable frequency (VVVF) control **Logic Control:** Microprocessor based Control with automatic level adjustment. **The control system shall be of field proven design and having satisfactory track record.** (Vendor shall furnish the list of power plants wherein similar system is in operation for last two years)
13.02.12	Flooring of Car	Chequered plate (6 mm thick) with PVC tiles.
13.02.13	Position of Machine room	Directly above the Lift shaft
13.02.14	Design, construction and finish of car	MS sheet

13.02.15	Lighting and fan in the car	One cabin fan and two numbers of 20 Watts, recessed fluorescent lamp fitting for operation on 240 V, 50 Hz, AC single phase power supply. Intercom connection also to be provided in the car.
13.02.16	Car entrance and landing door	MS sheet
13.02.17	Method of operation of car	Power operated type – Doors (both car and landing) for above elevator shall be centre opening, automatic, horizontal sliding type. Both Car door and landing doors shall be of SS construction.
13.02.18	Operation of Lift	Automatic, simplex, selective, collective with and without attendant, through illuminated pushbutton station located inside the car with provision for locking control in Auto or attendant position. Car operating panel shall be of box type with SS face plate & Pushbuttons.
13.02.19	Control/ Indicators and car accessories.	i) Digital Car position indicators inside car and at all landings. ii) Call indicators. iii) Travel direction indicators. iv) Twin tube concealed Fluorescent light fitting. v) Ventilation fan in the car. vi) Car operating panel. vii) Emergency stop switch viii) Intercom. Connection with telephone instrument inside the car ix) Fireman switch. x) Non-Luminous digital up/down Push Buttons at every landing and at the top of car, which shall be activated only for inspection mode. xi) Overload audio-visual alarm xii) Automatic rescue device xiii) Emergency light and alarm with battery and battery charger. xiv) One no 2 kg NAF PIV (HCFC Blend E) type fire extinguisher xv) Smoke detector inside car and connected to plant network.
13.02.20	Shaft lighting	The Lift shaft shall be illuminated by providing CFL lamps and light fittings at

		every 3m (three metre) from bottom of Lift well to the top of well. Fittings with lamp, conduits, pull boxes, wiring, switches, other components / accessories and necessary switches shall be provided.
13.02.21	Automatic Rescue Device	Battery operated Automatic Rescue Device to be provided for rescuing the personnel inside the car in the event of power failure. Suitably capacity of battery and accessories to make system complete shall be included in the offer.

13.02.21 Foundation plan and elevation with landing levels shall be as per purchaser (BHEL) drawings enclosed with the enquiry.

14.00.00 **MECHANICAL EQUIPMENT:**

14.00.01 **LIFT CAR:**

The car platform frame and sling shall be of steel construction. The platform shall be suitably isolated from its sling. The car shall be enclosed with suitably braced and reinforced sheet metal panel. The sheet metal panel shall have ventilation slots at the base. The car interior, the car doors and the landing doors shall be finished with two coats of baked enamel or other suitable paint as approved by the purchaser.

The car platform shall be robust in construction and elegant in appearance. The car shall be provided with the following accessories:

a) Car control station with position indicator inside the car and at landing platforms.

b) An emergency stop switch (shall have two sets of potential free contact. Second one shall be taken and terminated in machine room for further connection by owner)

c) A three pin plug & socket with switch on top of Lift car for use by persons working there on.

d) Telephone instrument shall be provided inside the car. Connection from the same shall be brought up to the machine room for further connection to plant network by customer. Telephone instrument provided inside the car shall have provision for hands free operation also, i.e. Speaker phone shall be provided for hands free operation

e) For better safety, elevator vendor to provide car top barricade on car top to ensure that service personnel stay inside the car region. A selector switch and a set of push buttons shall be provided on the top above the ceiling of the car to operate the elevator locally for inspection and maintenance. The selector switch when set to

position “inspection” shall exclude control from other places and movement of the car in the desired direction shall be effected by the push buttons. For normal operation of the elevator, the selector switch shall be set to the position working. It shall be possible to operate the elevator only when the appropriate button is kept in pressed condition. The roof shall be strong enough to support at least two persons.

Adequate lighting and ventilation shall be provided in the Lift car. The car shall be fitted with fan of adequate capacity and lighting with decorative fittings. The car platform shall be robust in construction and elegant in appearance.

The car shall be provided with an emergency alarm push button inside the Lift car which shall be clearly marked. The alarm shall be clearly audible outside the Lift way in order to obtain assistance in case of breakdown or failure between the floors.

Car shall be equipped with handrails on three sides.

14.00.02 **CAR DOOR:**

The car door shall be of hollow metal construction 16 gauge thick MS steel sheet. Sides of the door shall be flush with all seams continuously welded. Guide shoes shall be rubber or roller type designed for operation on un-lubricated guides. The car door shall be provided with locking gear of heavy and robust construction, so arranged mechanically and interlocked that the doors cannot under any circumstance be opened unless the Lift car is within a particular landing zone. Conversely the Lift shall not move until all the landing doors are closed and interlocked properly.

Width of Car Entrance shall be as per relevant BS / DIN / Syrian Arab Republic standards subject to a minimum of 1100 mm. (Vendor to select whichever is higher)

The live load coming into play shall be taken into consideration while designing doors, doorframe and hanger tracks. The car doors shall be designed such that their closing and opening is not likely to injure a person. A retractable safety shoe shall extend the full height and project beyond the front edge of the car, to open the closing door if and when it touches a person or an object. Alternatively opening of car by means of optical sensing can be envisaged.

14.00.03 **LANDING DOORS:**

The landing door shall be of hollow metal construction or MS steel sheet with thickness as per manufacturer’s standard.

All landing openings in the Lift well enclosure shall be protected with doors, which shall extend the full height and width of the landing opening. The type of door provided shall be similar to the Lift car door. Every landing door shall be fitted with a locking device. The door shall be suitably interlocked so that they cannot open unless the car is within a particular landing zone. The levers operating the locking devices shall not interfere with the landing side or Lift enclosures. These doors shall be smoke tight as far as possible.

14.00.04 **LOAD PLATE:**

A load plate displaying the rated load of the Lift in terms of persons and kilograms shall be fitted in the car in a conspicuous position.

14.00.05 **SUSPENSION ROPES:**

The car and the counter weights shall be suspended by steel wire ropes. Chain shall not be used for suspension. Not less than four independent stranded steel wire suspension ropes shall be used for car or counter weights of the Lift with traction drive. The minimum diameter of the stranded rope shall not be less than 12.5 mm and minimum factor of safety shall not be less than 12. The suspension ropes shall conform to latest edition of relevant BS / DIN / Republic of Syrian Arab Standards for Specification for steel wire suspension ropes for Lifts and hoists.

14.00.06 **SHEAVES AND PULLEYS:**

All driving sheaves and pulleys fixed to and revolving with the shaft shall be fixed by means of sunk keys of sufficient strength and quality. Sheaves and pulleys shall be made of cast steel (made as per relevant BS / DIN / Republic of Syrian Arab standards) free from cracks, sand holes and other injurious defects. They shall have suitable flanges and smoothly machined rope grooves. The diameter of the sheave or pulley shall be as specified in the latest edition of BS / DIN / Republic of Syrian Arab Standards.

14.00.07 **SHAFT:**

Shafts and axles shall be of forged steel. They shall have sufficient rigidity and bearing surface. Any shaft when stepped shall be turned to a reasonable radius at the point of reduction.

14.00.08 **COUNTER WEIGHTS:**

The Elevator shall be provided with suitable counter weights located in the Lift shaft. The counter weight shall be designed for smooth and easy operation of the Lift and shall be in accordance with the relevant BS / DIN / Syrian Arab Republic Standard. Suitable counter weight screen shall be provided in the Elevator shaft. The counter weights shall consist of cast iron weight contained in structural steel frame. It should preferably be equal to that of the car weight plus 40 % of the rated load. The traction should be such that no appreciable slip may occur but that slip shall free to take place upon the landing of either the car or the counter weights.

14.00.09 **GUIDE RAILS:**

Guide rails for the car and counter weights shall be machined ‘T’ sections and continuous throughout the entire length and shall be provided with adequate steel brackets and spacing between brackets shall be such that to avoid any deflection during the normal operation. Guide rails section shall be adequate to withstand the forces resulting from the application of the safety gear when stopping the counter weights or fully loaded car. The guide shoes or their lining shall be easily renewable, adjustable and self lubricated. Guides shall be of such length that it shall not be possible for any of the car or the counter weight shoes to run off the guides.

14.00.10 **BUFFERS:**

Sufficient number of buffers of spring-loaded type shall be fitted below the Lift car and counter weights. The buffers shall be capable of stopping the car or counter-weights without permanent damage or deformation to itself or any part of the Lift equipment. The number of buffers shall be so fixed as to ensure proper sharing of the impact loads by all of them.

14.00.11 **EMERGENCY SAFETY DEVICES AND BRAKES**:

The Lift shall be provided with safety device attached to the Lift car frame and placed beneath the car. The safety device shall be capable of stopping and sustaining the Lift car up to governor tripping speed with full rated load in car. The application of the safety device shall not cause the Lift platform to become out of level in excess of 3 cm/m measured in any direction. Slack rope switches, if necessary, shall also be provided. The Elevator vendor shall also provide personnel evacuation system during the power failure to the Elevator.

The Machine shall be provided with direct current spring set, solenoid release double shoe brakes of sufficient capacity to stop the car at any position with the design load. These brakes shall be designed in such a way that it gets applied automatically in the event of power failure.

AUTOMATIC RESCUE DEVICE (ARD)-(BATTERY DRIVE):

Contractor shall provide a modern advanced electronic drive system for “RESCUING Passengers Trapped in an ELEVATOR” in case of power failure or any other system failure. Elevator car shall come to nearest landing level and open automatically so that passengers can come out safely.

In addition to the above, bell and cranking device to be provided with hand wheel connected with motor shaft for manual lowering of elevator to the nearest landing level.

14.00.12 **OVER SPEED GOVERNOR AND GOVERNOR ROPES:**

Governor shall be located where there is sufficient room for proper operation and where it cannot be struck by the Lift car or counter weight in the event of over run. Each governor shall be marked with tripping speed in terms of a car speed in m/sec and the motor control and brake control circuit shall be opened before or at the time the governor trips. Governor ropes shall not be less than 8 mm in diameter and shall be of steel or phosphor bronze and of suitable construction. The ropes shall run clear of the governor jaws during normal operation of the Lift. The Governor has to be compatible for operation of elevator.

14.00.13 **LEVELLING DEVICE:**

The Lift shall be provided with a two-way automatic levelling device. The levelling device shall take care of overrun and under run of the car and rope stretch, such that car floor is within 6.0 mm from the landing level at all floors while in operation. Aprons of sufficient depth shall be fitted to the car floor to ensure that no space is permitted between the threshold and the landing while the care is being levelled to floor.

14.00.14 **MACHINE ROOM AND OVERHEAD STRUCTURES:**

All the overhead machinery shall be supported on beam to be furnished by the contractor. The machinery support beam shall rest on top of the contractor's structural steel frame for the boiler house, or it shall be designed to be framed into the contractor's structural steel frame for the boiler house.

The Lift drive controller and all other apparatus and equipment of Lift installation, except such apparatus and equipment which function in the machine room shall be located at the top of the Lift well. Adequate machine room and hoist way lighting shall be provided by the Elevator vendor. The maximum loads transmitted by the single heaviest equipment both during erection and maintenance of the Lift to the machine room floor and other structures like guides etc. shall be furnished by the Elevator vendor within 15 days of placing the award letter. Sound reducing materials below machines in machine room shall be provided.
Machine room shall be provided with Industrial type vitreous enamelled reflector - 2 X 40 W (for min. 100 Lux) Fluorescent Lamp.

Note:
If vendor is offering an elevator system without the requirement of machine room, additional details as required for the same to be highlighted in the offer itself.

14.00.15 **TERMINAL STOPPING AND FINAL LIMIT SWITCHES:**

The Lift shall be equipped with upper and lower normal terminal limit switches arranged to stop the car automatically within the limit of the top car clearance and bottom run by from any speed attained in normal operation. Such limit switches shall act independently of the operating device, the final limit switches and buffer.

Final limit switches shall be provided to stop the car automatically within the top and bottom clearance independent of normal operating device and the terminal limit switches. The final limit switch shall act to prevent movement of the car under power in both directions of travel and shall after operating, remain open until the Lift car has been moved by a hand operating mechanism within the limits of normal travel.

14.00.16 **INDICATORS:**

The Lift shall be provided with position indicator of Box type with SS face plate and LED display and call indicator inside the Lift car to show the position of the Lift car with reference to the floor numbers and the landing from which the call is being received. Up and down travel direction and position indicators shall be of standard construction. Audio annunciation also shall be provided inside the car.

14.01.00 **ELECTRICAL EQUIPMENT AND CONTROLS:**

14.01.01 **OPERATION AND INTERLOCKS:**

The operation of the Lift shall be simplex, selective, collective, and automatic, with or without operator. The Lift operation shall conform to the following requirements.

a) The operation of the Lift shall be through a push button station located inside the car.

b) The Lift shall not move unless the car door, landing door and all other protected openings connected with the control circuit are closed.

c) Two push buttons, one for upward and the other for downward movement at each intermediate landing and one push button at each terminal landing shall be provided in the landing floors in order to call the car.

d) The landing doors shall be interlocked so that the landing door at any floor shall not open when the Lift is not on that floor.

e) Push button shall be fixed in the car for holding the doors open for any length of time required.

f) Emergency light and alarm with battery & battery charger shall be provided.

14.01.02 **LIFT DRIVE:**

The Lift drive shall be equipped with automatic electro-hydraulic thruster brakes. The Lift shall be driven by a drive suitable for method of control offered by the Elevator vendor. No friction gearing or clutch mechanism shall be used for connecting the main driving gear to the sheaves.

14.01.03 **ELECTRIC MOTORS**:

Motors shall be suitable for frequent starting. S4 duty class as per IEC 60034 with CDF 40% and maximum 150 starts per hour at 50 Deg. C ambient and with IP 54 protection class. Motor pull out torque shall be at least 275% of rated torque. Motor shall be of TEFC type. Motor insulation shall be class F or superior with temperature rise limited to class B.

14.01.04 **CONTROLLERS:**

The controllers shall be designed to start, accelerate, stop and reverse the Lift when the appropriate push buttons are pressed. It shall be arranged so as to provide maximum convenience to the operator. Contact finger buttons shall be easy to adjust and replace. The speed control device shall be such as to give smooth, easy and accurate speed control. The Lift controls shall be housed in dust and vermin proof enclosures. The controls shall be wired with stranded copper conductor cables. All equipments mounted shall be neatly labelled as per wiring diagram. Ventilating louvers are to be provided in the panels.

The electrical controllers shall be provided with enclosure conforming to IP-54. The contactors, relays, resistors etc. used in the total system shall be of open type construction and design. Vendor shall furnish the size of controller panel (Length x Depth x Height) in the offer.

14.01.06 **CABLES AND INTERNAL WIRING:**

All cables (both power and control) shall be armoured XLPE insulated & FRLS PVC sheathed.

Wiring shall be done as required to interconnect all Elevator electrical equipment including all power wiring from the main supply source in the machine room. 1100 V grade Power cables shall be multi core, stranded Cu conductor with XLPE insulation,

FRLS type ST2 inner sheathed, galvanised steel wire armoured and overall extruded FRLS, Type ST2 PVC sheath.

All cables including trailing cables shall conform to latest edition of relevant IEC standards.

14.01.07 **CABLING AND EARTHING**:

Earthing shall be carried out as per relevant IEC/ BS / DIN / Syrian Arab Republic standards and Electricity Rules prevailing at Syrian Arab Republic. The Lift structures, motor, frames, metal cases and all electrical equipment including conduit, cable armouring and guards shall be properly bonded and earthed by two separate and distinct connection. The Elevator vendor shall provide 25 x 3 mm GI flat for control panel and 50 x 6 mm GI flat earth bus in the machine room and connect all earth points to the same. The earth bus will be connected to the station earth mat provided by the owner.

15.00.00 **OTHER REQUIREMENTS:**

15.00.01 Electric high-speed door operators for the opening and closing of the car doors and landing doors shall be furnished and installed. The car and landing doors shall be mechanically connected and shall move simultaneously in opening and closing. The car door and landing door shall be power closed and shall be controlled in opening and closing by oil cushioning mechanism built into the gear unit. Necessary lockable switches shall be provided in the Lift machine room to control the operation of the door. Should the electric power fail, it must be possible for the doors to be manually opened from within the car.

15.00.02 Overload relays shall be provided to protect the drive motor against overload or a power failure. Suitable protection shall be provided on the controller to protect the Lift equipment from phase reversal and low voltage.

15.00.03 A complete set of special tools and tackles required shall be supplied along with Lift. Each tool and tackle shall be stamped so as to be identified easily for its use and size. Tools shall be supplied in a steel toolbox. (The list of tools and tackles shall be furnished along with the offer).

15.00.04 **SPARES:**

The vendor shall furnish the List of recommended spare parts and include the prices separately in the offer with item wise price in the schedule of spare parts. Purchaser reserves the rights to finalise the quantities of spare parts and effect price adjustment on the basis of unit rates quoted. The spares ordered by the purchaser shall be delivered at site to suit the commissioning of the respective units. The vendor shall indicate in the schedule of spare parts the delivery period from the date of acceptance of the offer for the spares. The vendor shall also indicate in the schedule of spare parts, the details of fast slow and medium moving spares.

The spares recommended above with unit prices shall be at least for three years normal consumption for operation of the plant. The vendor shall also indicate the service

expectancy for these spare parts under normal operating conditions before the replacement is necessary.

All the spares supplied under this contract shall be strictly interchangeable with the parts for which they are intended for replacement. The spares shall be treated and packed for long storage under the climatic conditions prevailing at site (e.g.) small items shall be packed in sealed transparent plastic bags with dissector packs as necessary. Each spare part shall clearly be marked or labelled on the outside of the packing in single case. The general description of the contents shall be shown on the outside of such cases. All cases, containers and other packages shall be marked suitably and numbered for the purpose of identification.

All cases, containers and other packages are liable to be opened for such examination as may be felt reasonable by the purchaser. The vendor shall bear in mind the shipment of the plant having ball or roller type bearings for which the following special provisions shall apply:

i) If temporary transit bearings are fitted to such plant, then, additionally, two complete sets of service bearings shall be included and shipped with such plant.

ii) If the item of the plant is shipped with service bearings in position, then additionally one complete set of service bearings shall be included and shipped with such plants. In either or both of the above provisions, the cost of the additional sets of bearings shall be included in the offer.

iii) If replacement of any bearing is required due to damages during shipment or other causes, the spare bearings shall be used to replace at free of charge.

The price of spares will have to be kept optional. As and when requirement arises the same will be utilised by BHEL.

16.00.00 **Acceptance:**

After erection, the performance of the Lift shall be tested for ascertaining the conformity with statutory requirements and this specification. Upon satisfactory completion of the tests; the Lift will be taken over. **The responsibility for obtaining commissioning and handing over protocol signed by the customer lies with the Elevator vendor and prices to be included in the priced bid.**

17.00.00 QUALITY ASSURANCE AND TESTING:

a. Vendor shall prepare Quality plan in the BHEL standard Quality Plan format (copy enclosed) along with offer. This QP shall contain all the required quality checks right from the raw material stage through in process, Assembly, Testing & Final inspection. Reference can be drawn from earlier approved QP. The same shall be submitted to BHEL for review & approval for a fixed period of time.

b. The vendor shall incorporate all BHEL comments along with P.O. Number, Project name, etc and submit to BHEL for approval. This QP shall form part of Purchase order.

c. Elevators are subject to inspection by BHEL and inspection call shall be given 15 days in advance.

d. Vendor shall submit the routine & type test certificates along with inspection call.

e. The validity of type test certificates shall be not earlier than 5 years from the date of enquiry.

18.00.00 Packing:

Seaworthy packing is required for all items despatched to site.

19.00.00 Documentation:

19.00.01 Within 15 days from the date of LOI, all the final Drawings / documents specified in Clause below shall be submitted.

19.00.02 Number of copies of drawings and documents to be submitted after award of order shall be as follows.

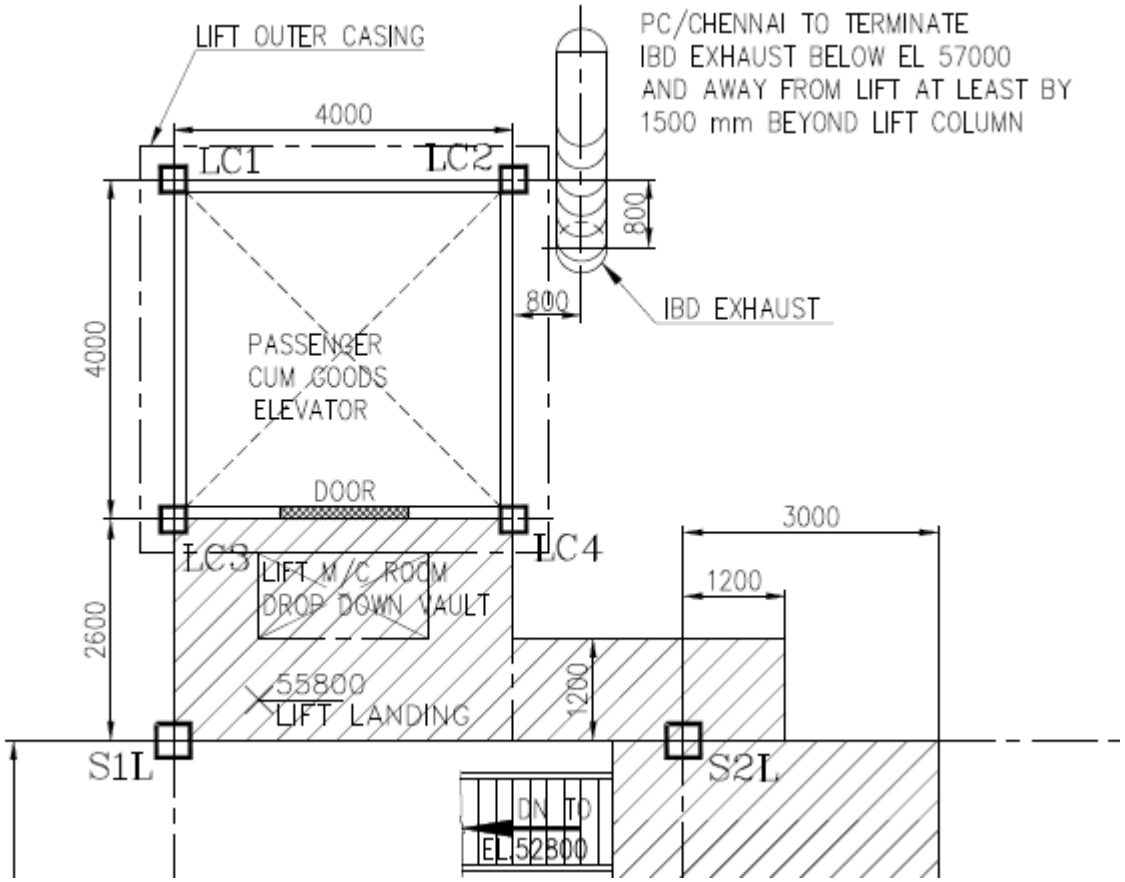
SL.NO:	DESCRIPTIONS	NUMBER OF PRINTS	NUMBEROF CD ROMS
1.	Drawings for "Approval"	**4**	**---**
2.	Data sheets & other type of documents	**4**	**---**
3.	Operation & Maintenance manual including As built drawings.	**4**	**2**
4.	Test certificates / reports	**2**	**1**
5.	Copy of relevant standards for elevator	**1**	**---**

20.00.00 Optional Prices

Optional prices shall be furnished for annual maintenance contract of elevator separately. Customer may place order on the same if they deem it necessary.

NOTE:

ANY CLARIFICATION / COMMENTS ON THIS SPECIFICATION OR SCOPE DIVISION OR NON-CONFIRMANCES OR SUGGESTIONS FOR IMPROVEMENTS SHALL BE BROUGHT OUT IN THE OFFER ITSELF. DEVIATIONS WILL NOTE BE REVIEWED AFTER PLACEMENT OF ORDER.



PROJECT: TISHREEN THERMAL POWER PLANT, EXTENSION PROJECT
2X200 MW, DAMASCUS, SYRIA
CUSTOMER NO. 1208 & 1209