**Attachment 1**

**Major Components; Vendor Data and References**

**From:** John.Arntson@ct.spx.com [mailto:John.Arntson@ct.spx.com]
**Sent:** Tuesday, April 28, 2009 5:20 PM
**To:** Jim Hubbard
**Cc:** Joseph.Padilla@ct.spx.com; TERRY.DWYER@ct.spx.com
**Subject:** San Onofre NP: Plume Abated Towers for Enercon

Jim,

Here you go:

**Assumed Design Points for SONGS:**

Wet Operation:
Flow =276,666 gpm (830,000 gpm for 3 towers)
HWT = 108.6 deg. F
CWT = 90.0 deg. F
IWBT = 75 deg. F
Plume Point:
DBT = 35 deg. F
WBT = 32 deg. F
TDS = 1.5 cyc salt water

**Preliminary Tower Selection: 3 Towers/Unit**

Model No.: F488-6.0-15 PPWD
Fill Type & Depth: 6 ft anti-fouling PVC film (Marley MVC-20)
Structure: FRP
Hardware: Silicon Bronze
Heat Exchangers: Titanium tubes and tube sheets
No. Cells = 15/tower
Cell width and length: 48 ft x 48 ft
Basin width and length: 56 ft x 721 ft 4 in
Motor Output Power = 250 HP/cell (2.8 MW/tower total)

**Budgetary Price = $ 81,200,000 for three towers per Unit excluding basins, inlet piping and risers, power and control wiring.**

Attached find performance curves for wet operation.

Let me know if you have any questions.

Regards,
John K Arntson

SPX Cooling Technologies, Inc.
7401W 129 th St.
Overland Park, KS 66213
Phone: 913-664-7854
Fax: 913-693-9633
E-mail: john.arntson@ct.spx.com

**From:** John.Arntson@ct.spx.com [mailto:John.Arntson@ct.spx.com]
**Sent:** Thursday, May 14, 2009 10:50 AM
**To:** Jim Hubbard
**Subject:** SONGS

Jim,

Tower height to top of fan stack: approx. 50 ft
Std. drift rate = .001%. .0005% can be offered with mutually agreed test procedures.

FYI,

John K Arntson

SPX Cooling Technologies, Inc.
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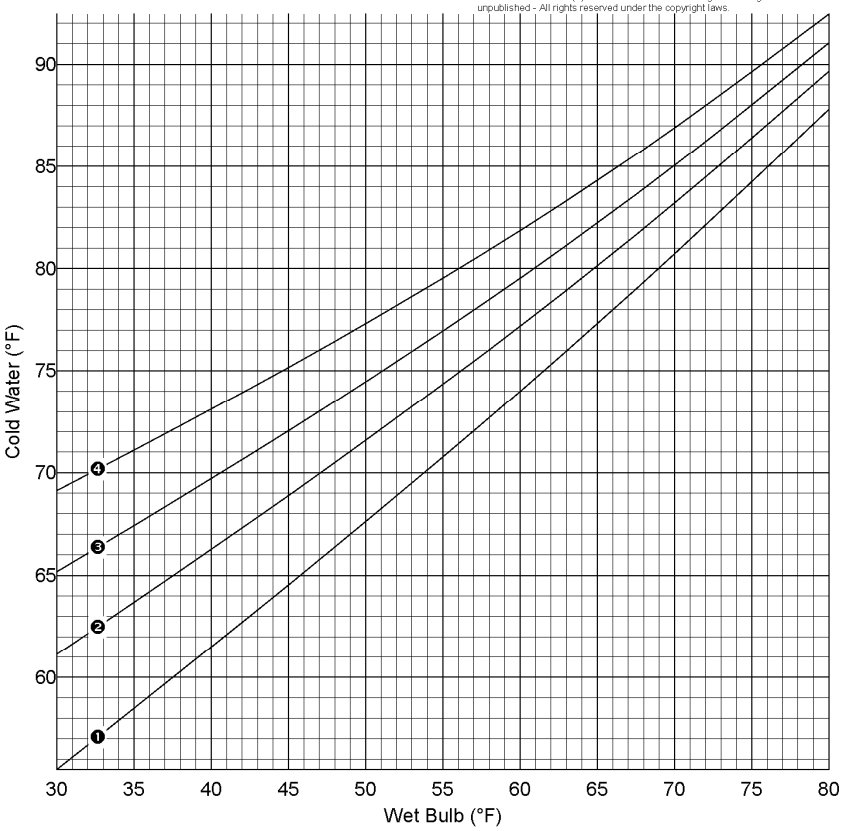
Overland Park, KS 66213
Phone: 913-664-7854
Fax: 913-693-9633
E-mail: john.arntson@ct.spx.com

Performance Curve for
San Onofre Nuclear Plant




SPX Cooling Technologies
TRACS Version 18-SEP-08

| | |
|---|---|
| Model | F488-6.0-15PPWD |
| Number of Cells | 15 |
| Motor Output | 250HP |
| Motor RPM | 1800 |
| Fan | 10MHP7-10 |
| Fan RPM (Full Speed) | 119 |

Design Conditions:

| | |
|---|---|
| Flow Rate | 276666GPM |
| Hot Water | 108.60°F |
| Cold Water | 90.00°F |
| Wet-Bulb | 75.00°F |

Curve Conditions:

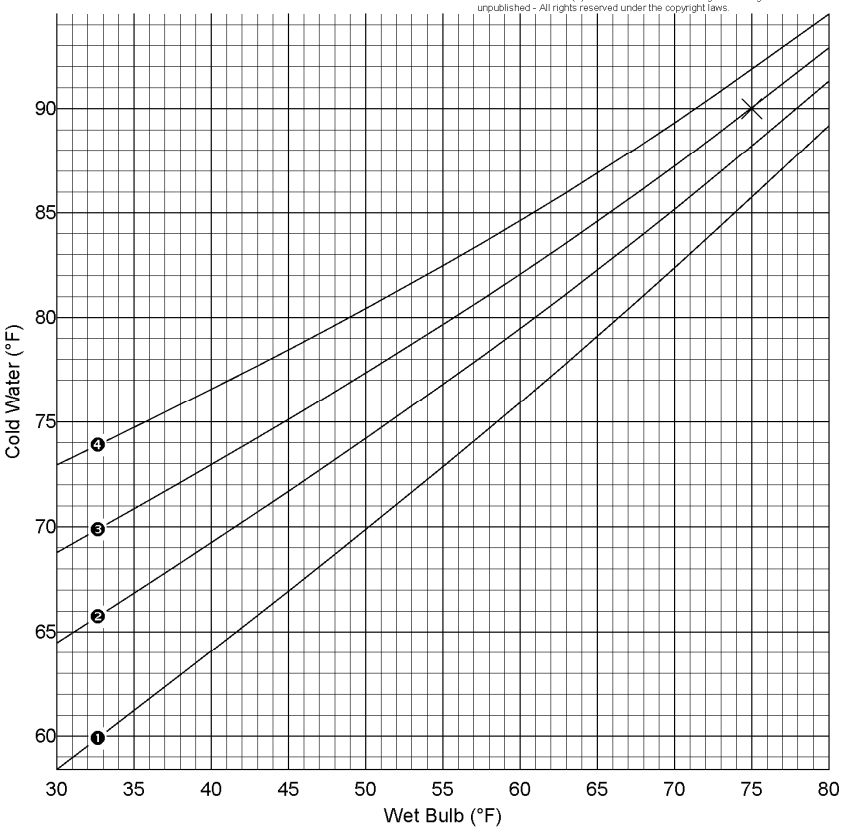
| | |
|---|---|
| Fan Pitch | Constant |
| Dry Dampers | Closed |
| Rel.Humidity | 50% |
| Flow Rate ( 90% Design Flow ) | 248999GPM |

| | |
|---|---|
| ❹ | 23 °F Range |
| ❸ | 18.6 °F Range |
| ❷ | 15 °F Range |
| ❶ | 11 °F Range |
| X | Design Point |

Time: 13:43:51 Date: 04-28-2009 Drawn By: MP

Performance Curve for
San Onofre Nuclear Plant






SPX Cooling Technologies
TRACS Version 18-SEP-08

| | |
|---|---|
| Model | F488-6.0-15PPWD |
| Number of Cells | 15 |
| Motor Output | 250HP |
| Motor RPM | 1800 |
| Fan | 10MHP7-10 |
| Fan RPM (Full Speed) | 119 |

Design Conditions:

| | |
|---|---|
| Flow Rate | 276666GPM |
| Hot Water | 108.60°F |
| Cold Water | 90.00°F |
| Wet-Bulb | 75.00°F |

Curve Conditions:

| | |
|---|---|
| Fan Pitch | Constant |
| Dry Dampers | Closed |
| Rel.Humidity | 50% |
| Flow Rate | 276666GPM |
| ( 100% Design Flow ) | |

| | |
|---|---|
| ❹ | 23 °F Range |
| ❸ | 18.6 °F Range |
| ❷ | 15 °F Range |
| ❶ | 11 °F Range |
| X | Design Point |

Time: 13:44:03 Date: 04-28-2009 Drawn By: MP

The following email was sent to ENERCON for the purposes of providing cost multipliers for noise attenuation. These multipliers were supplied by SPX Cooling Technologies for hybrid linear mechanical draft cooling towers with 250 HP fans, which are equivalent to those quoted for SONGS by SPX Cooling Technologies.

**Sam R Beaver**

---

**From:** John.Arntson@ct.spx.com
**Sent:** Tuesday, August 28, 2007 2:55 PM
**To:** sbeaver@enercon.com
**Cc:** JIM.VANGARSSE@ct.spx.com; TERRY.DWYER@ct.spx.com; Richard.Coughlin@ct.spx.com

Sam,

For talking purposes the price of a plume abated tower (8 in-line cells) will be approximately 2 x of the above budgetary pricing. If water noise sound abatement is required.... add 15 %. If low noise fans are required....add 20 %.

Regards,

John K Arntson
SPX Cooling Technologies, Inc.
7401W 129 th St.
Overland Park, KS
66213

GEA Power Cooling, Inc.

143 Union Blvd, Suite 400
Lakewood, CO 80228
Telephone: (303) 987-0123
Facsimile: (303) 987-0101

## PLUME ABATED MECHANICAL DRAFT COOLING TOWER

**Budgetary Information**

**Date:** 05/04/2009 **Ref. No.:** 1769
**Company:** Enercon
**Project:** San Onofre Conversion
**Contact:** Ashlie Brown
**Phone No.:** 770-919-1931 **Email.:** abrown@enercon.com

| Cooling Tower Design Requirements | |
|---|---|
| Circulating Water Flow | 415,000 gpm x 2 towers |
| Hot Water Temperature | 109.0 °F |
| Cold Water Temperature | 90.0 °F |
| Inlet Wet Bulb Temperature | 75.0 °F |
| Plume Point | 30.5 °F DBT / 72.5% RH |

| Cooling Tower Design | |
|---|---|
| Type of Tower | Counterflow |
| No. of Cells | 19 x 2 towers |
| Cell Arrangement | Inline |
| Cell Dimensions (L x W x H) | 54 ft x 54 ft x 54 ft |
| Overall Tower Dimensions | 1,026 ft x 54 ft x 64 ft |
| Dry Section Dimensions (per 1 side of a cell)* | 2 x 44' (L) x 10' (H) |
| Basin Inside Dimensions | 1,028 ft x 60 ft x 4 ft |
| Pump Head | 40 ft-$H_2O$ |
| Fan Diameter | 32.81 ft |
| Fan Stack Height | 10 ft |
| Fan Motor Output Power | 261 hp @ design / 277 hp @plume point |
| Total Fan Motor Output Power | 4,959 hp x 2 towers @ design |

| Cooling Tower Material Summary | |
|---|---|
| Structure | Fiberglass |
| Hardware | Si. Bronze |
| Tube Bundle Material | Titanium |
| Fin Material | Aluminum |
| Fill Type | Low Fouling (limit TSS to 150 ppm) |
| Distribution Type | Downspray |
| Motor Rating, HP | 300 |
| Motor Speed, rpm | 2 Speed / 1800 / 900 |

| Budget Information for 2 x 19 Cell Cooling Towers | |
|---|---|
| Material Price | $ 36,606,000 |
| Freight to Jobsite | $ 1,564,000 |
| Installation Labor (Union) | $ 17,721,000 |
| **Total Price** | **$ 55,891,000** |

GEA Power Cooling, Inc.

143 Union Blvd, Suite 400
Lakewood, CO 80228
Telephone: (303) 987-0123
Facsimile: (303) 987-0101

| Remarks |
| --- |
| *Each side of each cell contains 2 bundles stacked vertically |

GEA Power Cooling, Inc.

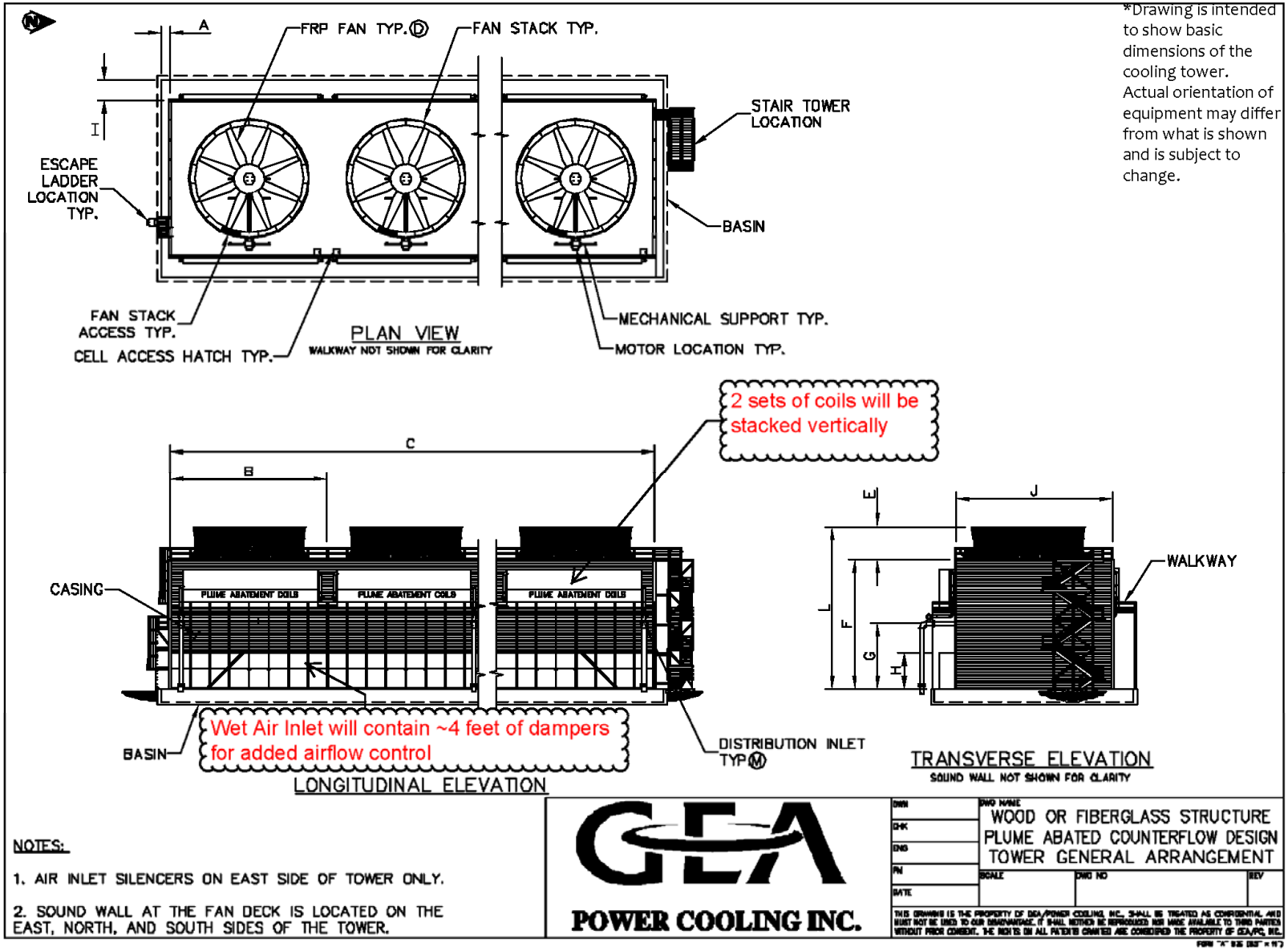
143 Union Blvd, Suite 400
Lakewood, CO 80228
Telephone: (303) 987-0123
Facsimile: (303) 987-0101

**MECHANICAL DRAFT COOLING TOWER EQUIPMENT SCOPE OF SUPPLY INCLUDES THE FOLLOWING:**

- Tower structure including casing
- Structural fasteners, connection plates and column anchors
- Deck hatches and distribution system access ladders
- Hand railing around the perimeter of the tower
- Stairway and caged ladder to the fan deck
- Fill
- Drift eliminators
- Internal water distribution systems including headers, laterals, and spray nozzles
- Mechanical equipment including fans, fan stacks, gearboxes, gear box fill/drain and vent pipes, mechanical equipment supports, composite drive shafts, fan motors, and vibration switches
- Complete Plume Abatement System
- Supply and Installation of Anchor Bolts
- Engineering and design of above noted items
- Freight (all material and equipment FOB project site)
- Unloading and storage at jobsite
- Installation supervision
- Installation of above noted items
- 3 days of technical services for startup (additional days can be provided on a per diem basis)

**NOT INCLUDED IN SCOPE:**

- Tower basin and foundations
- Circulating water pumps and circulating water piping
- Riser pipes, cell isolation valves, and expansion joints
- Bypass piping and associated equipment
- Electrical supply and/or installations: wiring, conduits, motor control centers, transformers, lighting system, grounding system, lightning protection system, and miscellaneous control circuits
- Variable frequency drives
- Noise attenuation equipment
- Sales and/or use taxes


*Drawing is intended to show basic dimensions of the cooling tower. Actual orientation of equipment may differ from what is shown and is subject to change.
A
FRP FAN TYP. Ⓓ
FAN STACK TYP.
STAIR TOWER LOCATION
I
ESCAPE LADDER LOCATION TYP.
BASIN
FAN STACK ACCESS TYP.
CELL ACCESS HATCH TYP.
PLAN VIEW
WALKWAY NOT SHOWN FOR CLARITY
MECHANICAL SUPPORT TYP.
MOTOR LOCATION TYP.
2 sets of coils will be stacked vertically
C
B
CASING
PLUME ABATEMENT COILS
PLUME ABATEMENT COILS
PLUME ABATEMENT COILS
Wet Air Inlet will contain ~4 feet of dampers for added airflow control
BASIN
DISTRIBUTION INLET TYP Ⓜ
LONGITUDINAL ELEVATION
E
J
L
F
G
H
WALKWAY
TRANSVERSE ELEVATION
SOUND WALL NOT SHOWN FOR CLARITY
NOTES:
1. AIR INLET SILENCERS ON EAST SIDE OF TOWER ONLY.
2. SOUND WALL AT THE FAN DECK IS LOCATED ON THE EAST, NORTH, AND SOUTH SIDES OF THE TOWER.
GEA
POWER COOLING INC.
DWG NAME
WOOD OR FIBERGLASS STRUCTURE
PLUME ABATED COUNTERFLOW DESIGN
TOWER GENERAL ARRANGEMENT
SCALE
DWG NO
REV

GEA Power Cooling, Inc.

**COUNTERFLOW FRP TOWER DIMENSIONS**

| | | | |
|---|---|---|---|
| Job Name: | Enercon-Conversion Study | | |
| Proposal Number: | 1769 | Revision: | 0 |
| Model Number: | 545454-19I-33-FCF | Date: | 5/4/2009 03:13 PM |

Number of Cells: 19 x2 towers

*GEA can provide a recommended tower orientation given prevailing wind direction and a plot layout

| Item | Reference Symbol | English | Metric |
|---|---|---|---|
| Cell Length: | B | 54 ft | 16.46 m |
| Cell Width: | J | 54 ft | 16.46 m |
| Tower Length: | C | 1026 ft | 312.73 m |
| Tower Width: | K | 54 ft | 16.46 m |
| Fan Deck Height: | F | 54 ft | 16.46 m |
| Fan Stack Height: | E | 10 ft | 3.05 m |
| Air Inlet Height: | H | 11 ft | 3.35 m |
| Distribution Inlet Height: | G | 20 ft | 6.10 m |
| Overall Tower Height: | L | 64 ft | 19.51 m |
| Fan Diameter: | D | 32.8 ft | 10.00 m |
| Transverse Basin Extension: | I | 3 ft | 0.91 m |
| Longitudinal Basin Extension: | A | 1 ft | 0.30 m |
| Distribution Inlet Diameter: | M | 36 in | 914 mm |

**From:** MMunch@flowserve.com
**Sent:** Thursday, June 04, 2009 6:49 PM
**To:** Richard Clubb
**Cc:** 'Tj Elberty'
**Subject:** RE: Circulating Water Pump Information

Richard,

Budgetary selection & pricing a follows:

**Pump 1**; 277,000 GPM @ 38 ft TDH.

Selection - 83APMA @ 270 RPM, n=88.5%, BHP=3,094 @ 1.03 SG. Minimum recommended submergence over the bell; FLS- 12 ft, HIS 20 ft.

Price- Based upon the 70F pumping temp , an all 316SS construction pump should be suitable. Budget price for the pump, above grade 90" discharge, non-pullout design, 128" diameter suction bell, requiring 38.5 " clearance; including a 3400 HP/275 RPM , WPII, 4160v/3/60 hz induction motor.....$ 2,160,000 net each.

Depending upon the water analysis an upgrade to 2205 duplex maybe recommended. This would increase the budget price to approx.....$ 2,535,000 net each.

**Pump 2:** 277,000 GPM @ 120 ft TDH.

Selection - 170RXL @ 237 RPM, n=88.5%, BHP=9,769 @ 1.03 SG. Minimum recommended submergence over the bell; FLS- 12 ft, HIS 20 ft.

Price - Based upon the 90F pumping temperature an all 2205 duplex construction pump is recommended. Budget price (similar pump description as above) including an 11,000 HP, 240 RPM, WPII, 13.2kV motor.....$ 4,400,000 net each.

Budget prices are based upon shipment within 2010 and include an allowance DDP jobsite. Approximate lead-times for this size equipment would be 60 weeks ARO.

If you have further questions, let me know.

Regards,

Michael Munch
Sales Engineer
Power Generation
2801 Hutchison McDonald Rd Ste T
Charlotte NC 28269-4275
mmunch@flowserve.com

HITACHI
Inspire the Next
Hitachi America, Ltd.
50 Prospect Avenue
Tarrytown, NY 10591-4625
Tel : (914) 631 0600 Fax: (914) 332-5388

Our Ref.# :ISD-8672
Date : June 22, 2009

US Enercon
Mr. Richard Clubb

## Budgetary Quotation

Dear Sir,
In compliance with your inquiry of US Enercon/San Onofre Nuclear Generation Station ; we have the pleasure of quoting on the goods as under-mentioned. Thanking you for you kind inquiry, and hoping to be favored with your valued order.

Yours very truly,

Hiroshi Katagiri / Director
Industrial Division

| Item | Description of Goods | Quantity | Price (USD) | |
|---|---|---|---|---|
| | | | Unit Price | Sub Total |
| | **US Enercon / San Onofre Nuclear Generation Station**<br>Vertical Type Mixed-Flow Pump | | | |
| 1 | Pump (1) 277,000gpm*38ft $\phi$2400mm | 6 | 2,472,000 | 14,832,000 |
| 2 | Pump (2) 277,000gpm*120ft $\phi$2400mm | 6 | 2,827,000 | 16,962,000 |
| | | **Total** | | **31,794,000** |

**Conditions**

1) **Payment Terms**

20 % in US Dollar by T/T remittance within 30 days after receipt of written order or the Project date.
80% in US Dollar of the order price to be paid within 30 days after CIF West Coast.

2) **Delivery Period and Term**

1. Delivery Period : 22(Twenty two) months (20 months for manufacturing, 2 months for shipping)
2. Delivery Term : CIF West Coast.

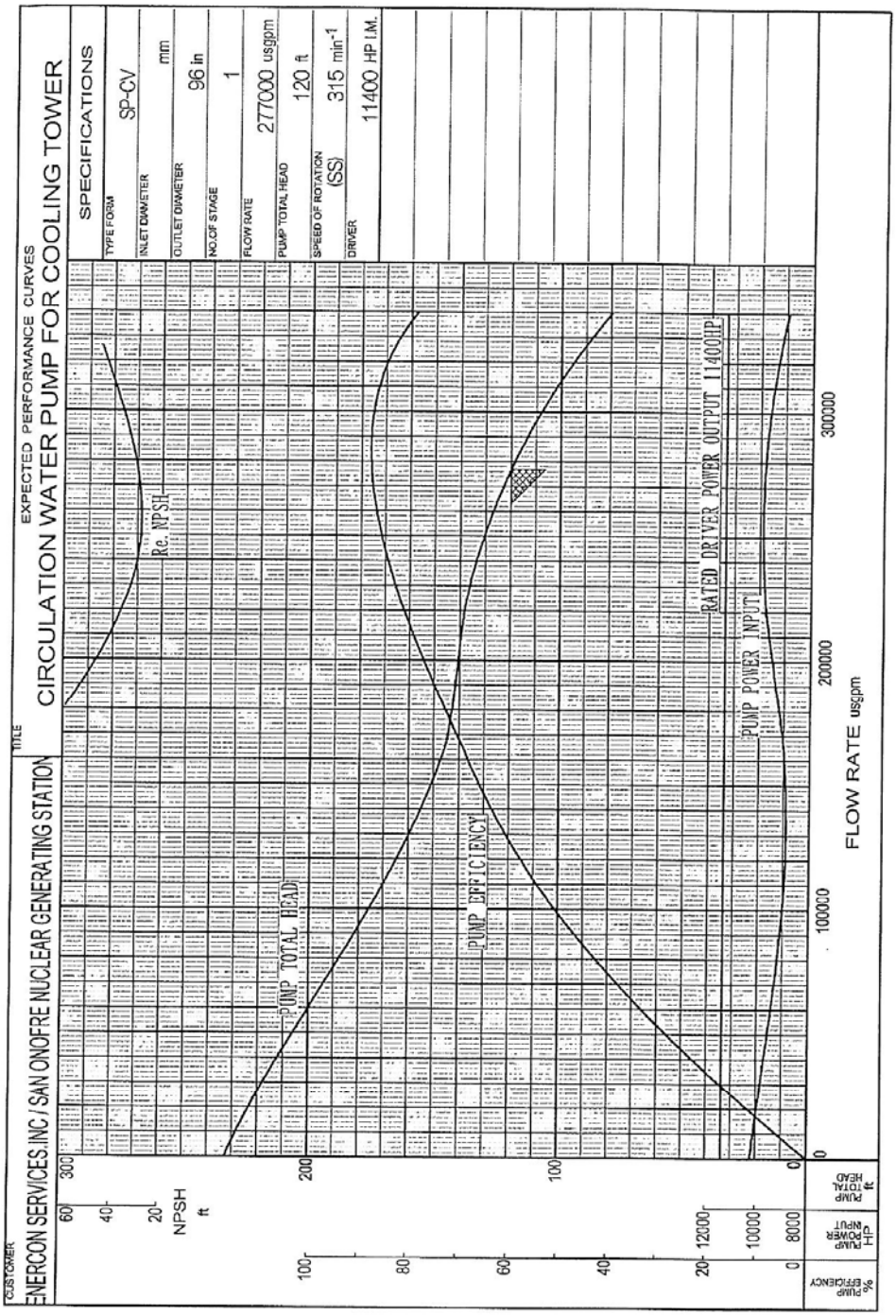
3) **Other conditions**

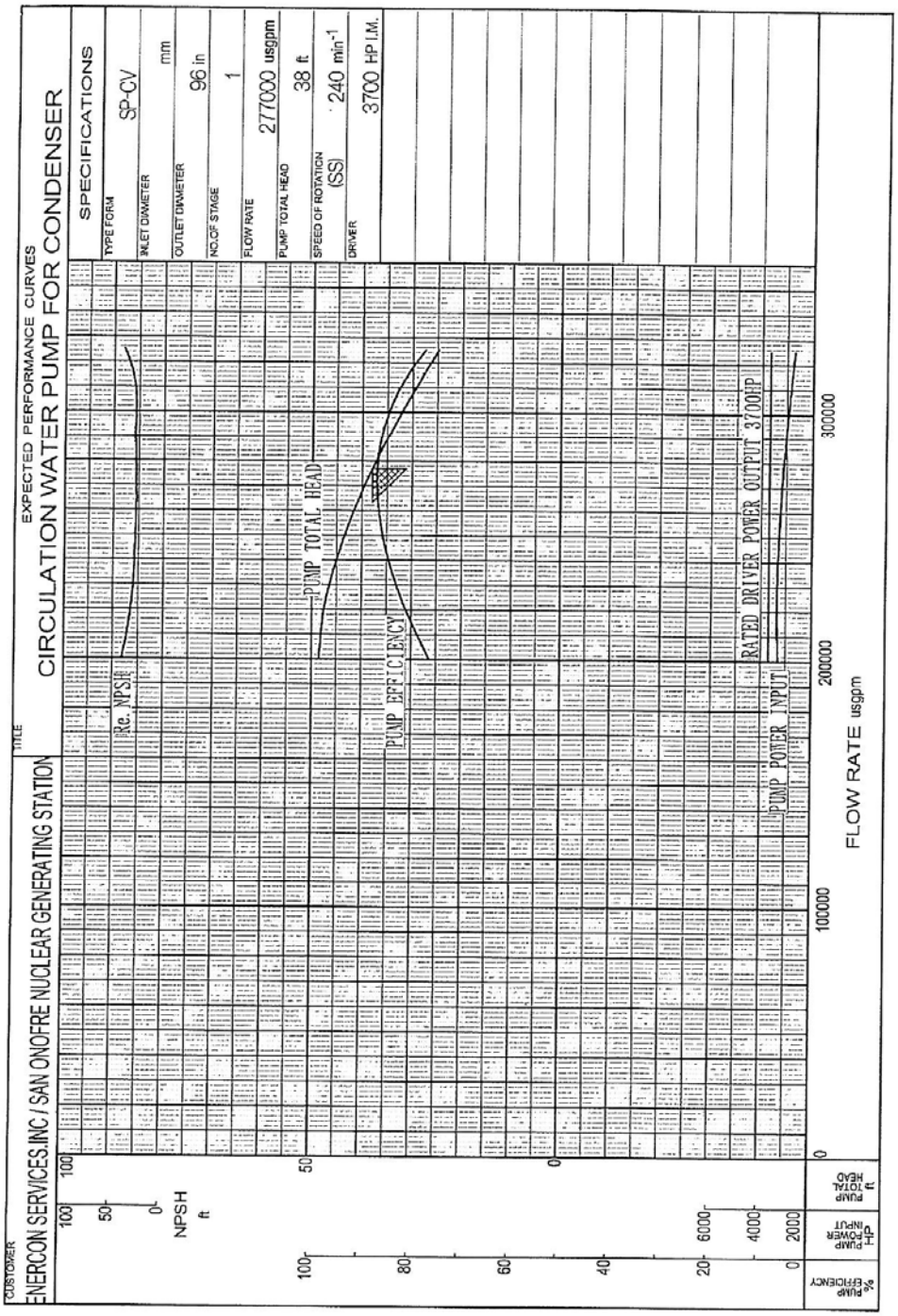
1. Motors and reduction gears are NOT included in this quotation.
2. For the Pumps are applied to Sea Water, Hitachi adopts Dulex as the material.
3. Please note that the ASME-N stamp and other standards for Pumps of Nuclear Generation Station are NOT applicable for the Pumps suggested above.
4. This quotation will be valid until 22 August, 2009.
5. This quotation is the rough price only.
6. The above price is exclusive of
   Any taxes, fees, other similar charges levied, assessed or imposed outside of Japan.
   Any cost associated with custom duties and inland transportation to site, civil and erection works and technical advisers.
7. Regarding the other details and conditions, as our proposal, please refer to the attached "General Terms and Conditions" (Doc.# HALGTC 01 Rev.0).

4) **Enclosed;**

1. "General Terms and Conditions" (Doc.# HALGTC 01 Rev.0).
2. "Expected Performance Curves"

1/1


CUSTOMER
ENERCON SERVICES,INC / SAN ONOFRE NUCLEAR GENERATING STATION
TITLE
EXPECTED PERFORMANCE CURVES
CIRCULATION WATER PUMP FOR COOLING TOWER
SPECIFICATIONS
TYPE FORM SP-CV
INLET DIAMETER mm
OUTLET DIAMETER 96 in
NO.OF STAGE 1
FLOW RATE 277000 usgpm
PUMP TOTAL HEAD 120 ft
SPEED OF ROTATION (SS) 315 min-1
DRIVER 11400 HP I.M.
NPSH ft
Re. NPSH
PUMP TOTAL HEAD
PUMP EFFICIENCY
PUMP POWER INPUT
RATED DRIVER POWER OUTPUT 11400HP
FLOW RATE usgpm
PUMP TOTAL HEAD ft
PUMP POWER INPUT HP
PUMP EFFICIENCY %


CUSTOMER
ENERCON SERVICES,INC / SAN ONOFRE NUCLEAR GENERATING STATION
TITLE
EXPECTED PERFORMANCE CURVES
CIRCULATION WATER PUMP FOR CONDENSER
SPECIFICATIONS
TYPE FORM SP-CV
INLET DIAMETER mm
OUTLET DIAMETER 96 in
NO.OF STAGE 1
FLOW RATE 277000 usgpm
PUMP TOTAL HEAD 38 ft
SPEED OF ROTATION (SS) 240 min-1
DRIVER 3700 HP I.M.
NPSH ft
Re. NPSH
PUMP TOTAL HEAD
PUMP EFFICIENCY
RATED DRIVER POWER OUTPUT 3700HP
PUMP POWER INPUT
PUMP EFFICIENCY %
PUMP POWER INPUT HP
PUMP TOTAL HEAD ft
FLOW RATE usgpm