

Manufacturing of Wind Mill Towers in Pakistan

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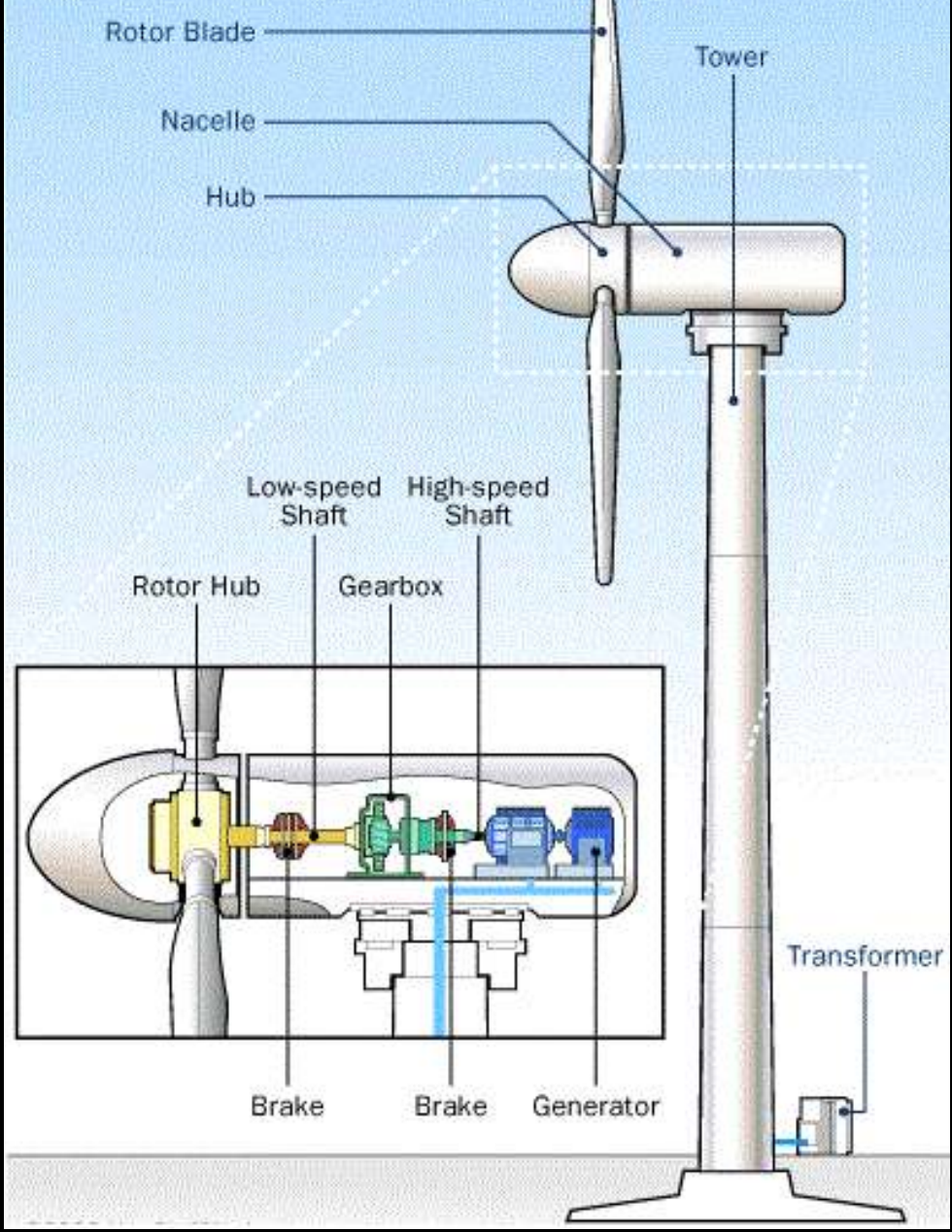
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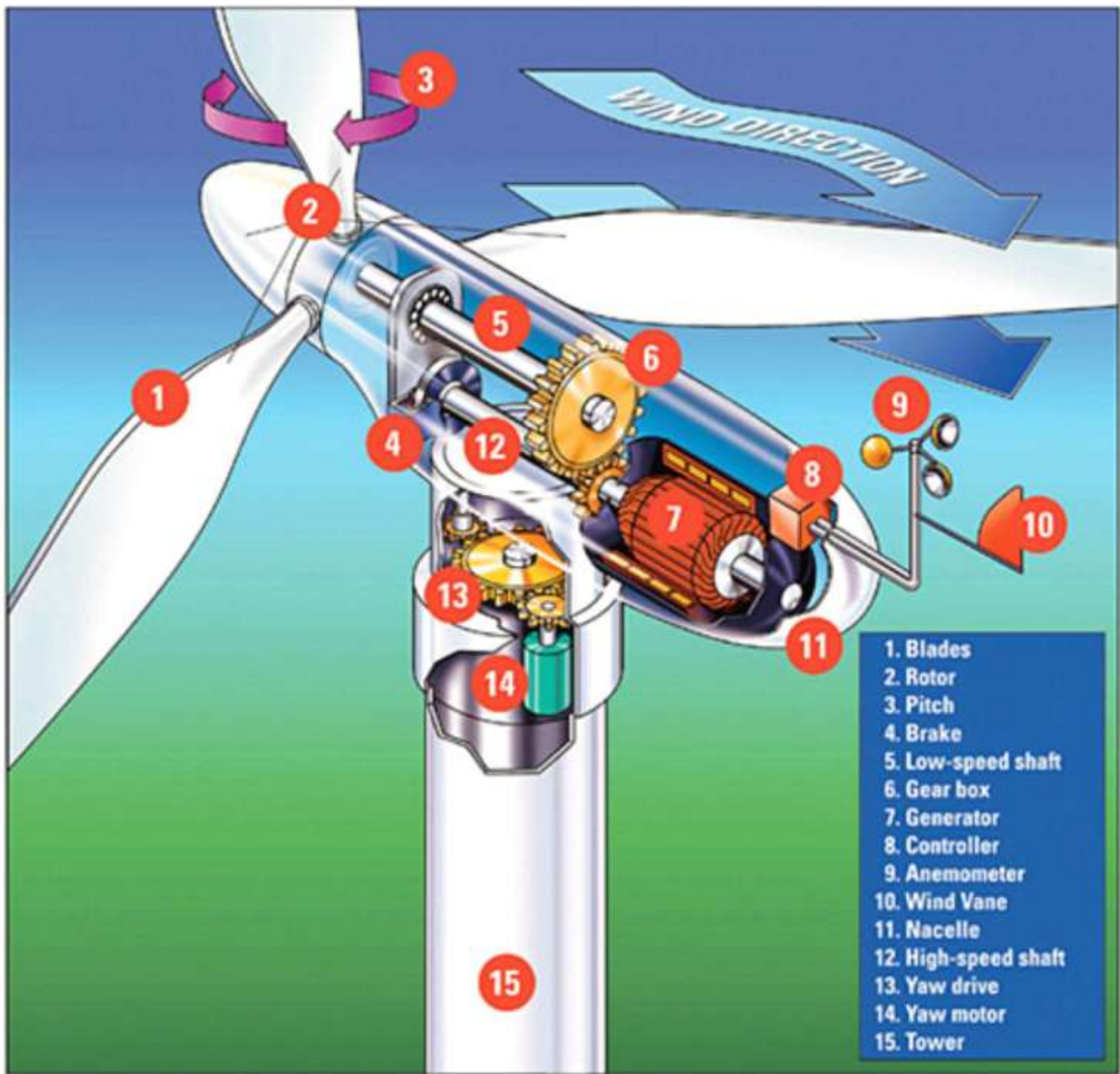
What is a Wind Mill ?

How does it work ?



How Wind Power Works Horizontal-axis Turbine





Task at hand

Fabricate and Install a 50 Mega Watt
Wind Farm.....



Scope Of Project

- 16 Months to complete project
- Total 33 Towers
 - 25 Local
 - 8 China
- Project Cost 134 \$M
- 2 Core Teams
 - Manufacturing
 - On Site Installation

Scope Of Manufacturing

- Fabrication & Supply of 25 No's Towers in 48 Weeks.
- Quality Documents according to EN standard.
- Materials (Plates, Flanges, etc) as per Nordex Specifications.
- Consumables & Equipment for fabrication.
- Internals including Ladder & Platforms (Out Sourced).

Specifications

- Height of each tower is 80 M.
- Each tower weighs about 148 Tons.
- Each tower comprises of “4” sections.
- 27 shells per tower. A total of 675 shells.
- 8 Flanges per tower.
- Total weight is about 3700 tons.

Procurement

- Shell Plates
 - About 3260 Tons of shell plates from China.
- Flanges
 - Forged Flanges from Korea.
- Internals
 - Ladder, man-lift, cables, electrical items from Europe, platform, sockets from China.

Fabrication

Shell Plates

- 675 plates to mark, cut, size, bevel & roll.

Weld Deposit

- Each tower will have about 1200 kgs of weld deposit.

Painting

- Surface preparation area of 66360m².

Facility

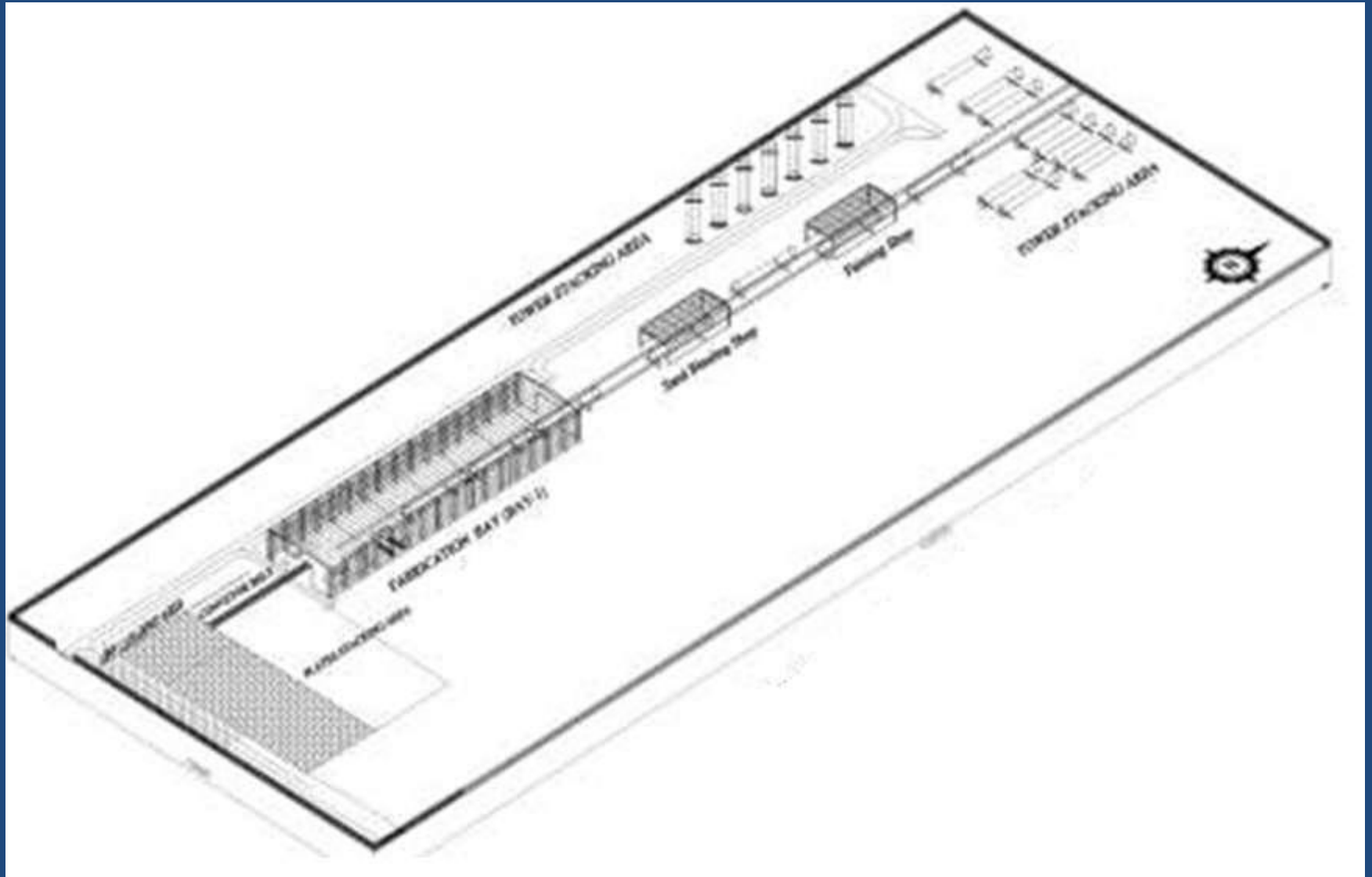


Plate Storage



Rollin of plates



CNC Plate Cutting



SAW Welding



SAW Welding of Flange



Sections in Production



SAW Welding of Shell to Shell



Flatness Testing of Flange



UT Testing of Weld Joint



Rolling out from Paint Shed



Internal Painting of Section



Internals Fitted in Bottom Section



Internals Fitted



Loading For Dispatch



Storage of Sections After Painting



Dispatch



Bottom Section Installation



2nd Section



3rd Section



Top Section



Nacelle on Ground



Nacelle being lifted



Rotor Hub on Ground



Rotor Hub being Installed





Costing

• Tower	15%
• Nacelle	37%
• Rotor	16%
• Civil works + Electrical	23%
• Miscellaneous	<u>9%</u>
	100%

What Next ?

Deletion Programme

- Import of Wind Towers to be **STOPPED.**
- Internal Fittings to be Developed Locally.
- Incentive to be given to encourage Export of Towers.

THANK
YOU