

Structural Testing and Upgradation:

Gactel Turnkey Projects Limited (GTPL) provides structural upgradation services for cooling towers which are old and their foundation and superstructure are deteriorating. Cooling tower is built to withstand a large number of forces. However with time structure wears up and these forces manifest themselves in the form of vibrations, cracks, misalignments, dis-colouration and peeling of walls etc. These problems must be handled within time else the problem aggravates to the point where it renders the cooling tower unusable.

Safety is one of the paramount requirement in any plant. Safety threats in a cooling tower, more so in worn out cooling tower needs to be assessed. Experience of GTPL's years of such assessment may be taken to get realistic picture of what needs to be done in cost effective way to mitigate such risks. GTPL service team inspects the whole cooling tower and records its condition from foundation to fan stack. Each ladder and staircase, walking surface to motor-gearbox foundation, fill support to columns and beams, each part is given full attention and possible cost effective solution is suggested.

Servicing of structural parts of cooling tower requires expertise and intricate understanding of its design and working. GTPL having years of experience in handling such structural upgradation work offers to provide any kind of services which a customer may require.

GTPL offers corrosion protection to pipes and superstructure of the cooling tower especially sea water application. Corrosion resistant paints like acrylic, epoxy, polyurethane, polyurea etc. are used as per customer's requirements.

GTPL also provides emergency services to cooling towers which have witnessed some structure failure or are on the verge of such disaster.

Structural Upgradation Services:

Structural Up gradation services are one of the integral services provided by the services team of Gactel Turnkey Projects limited (GTPL). The function of cooling towers is to provide cold water to the process. With time and continuous working the structure of cooling tower starts showing wear and tear. Load bearing capacity of foundations, columns and beams degrade and may ultimately fall. GTPL has immense experience in installing cooling tower and servicing them for years. We understand how cooling tower works. Accordingly there is a very well established procedure to inspect, analyze and remedy the problems faced by the cooling tower. Cooling tower is inspected by experienced team of engineers who survey the whole cooling tower, take measurement of various critical parameters and present them in well designed sheet. Based on the assessment on site, if problem is small, solutions are suggested on site but if something crucial is to be decided then a detailed analysis is done at head office. There calculations are done and solutions are suggested. A cost benefit analysis is also done for the customer to select the best economic option.

GTPL also suggests whether a new cell of cooling tower is required or existing cooling tower can be upgraded to get required performance.

The type of understanding required in refurbishment and upgradation of concrete cooling is so much that it covers all the aspects of civil engineering. Large experience is required to pin point the root cause and suggest the most economical solution. GTPL with years of experience in refurbishing concrete cooling tower offers any kind of structural refurbishment.

Some of the structural refurbishment services that are offered are:

- **Inspection:**

Cooling tower is inspected by experienced service professional who pin point all defects and root causes like damaged foundation etc. A report is prepared and if required proper test is suggested.

- **Testing:**

GTPL service professionals understand the value of testing before coming to any conclusion. Structural testing is done assess various parameters of structural strength and based on this data experts suggest solutions. Some of the tests are:

- Non Destructive Testing (NDT)
- Ultra sonic test
- Rebar locator test
- Pull out test

- **Protective coating of RCC and MS structure:**

GTPL provides protective coatings to prevent corrosion. We also provide protection against corrosion for sea water application

- **Strengthening of Structure:**

Reconstruction of damaged, load bearing members, foundation and superstructure by various means like grouting, fiber wrapping coating using Polymer Modified Concrete (PMC)/Polymer Modified Mortar (PMM)

- **Additional Load Bearing Members:**

Providing additional load bearing members wherever required

- **Mitigation of vibration:**

Root cause analysis is done to find reasons for vibrations. There may be many reasons like no load bearing column below gear box, problems with foundation of gear box, fan balancing etc. Corrective solutions are suggested to remedy vibrations.

Why Structural Upgradation:

There comes a time in the life of a working equipment where management has to decide whether a new equipment is required as replacement or the older one can be used after refurbishment. The key to this decision making is techno commercial analysis in which cost of new equipment is compared with the benefits accruing from refurbishment. This is more true for cooling tower where its cost itself is significant and time of building a new cooling tower is quite long that Upgradation becomes a very viable solution.

Structural upgradation services are required because of the following reasons:

1. To long last: Even though a cooling tower is new but the condition is shaky due to poor workmanship during construction like poor grade of concrete, covering, mixing etc
2. Ageing: Without investing huge capital cost in reconstruction of new cooling tower, an old cooling tower may be used by structurally upgrading it.
3. Safety: broken hand rail, slippery floor etc.
4. Time saved from constructing new cooling tower or cells
5. Part of thermal upgradation
6. Vibrations and signs of wearing out
7. Replacement of worn out items which is only done once a time (whole cooling tower), Cracks appearing, Excessive load on members-clogging of fills/weight gained
8. Loose piping, valves
9. Painting of structure, pipes and mild steel structures
10. Evident corrosion, Corrosion of reinforcement
11. Damages due to accident