

U. F. COMBINED CYCLE POWER PLANT

ACTIVITY:

REPARATION AND PROTECTION OF CONCRETE STRUCTURES (DECANTER) AND METAL MECHANICAL PARTS.

LOCATION: Combined Cycle Plant Aceca - Toledo - Spain.

FINALIZATION: April 2009.

CONTEXT:

The initial state of the decanter was as follows:

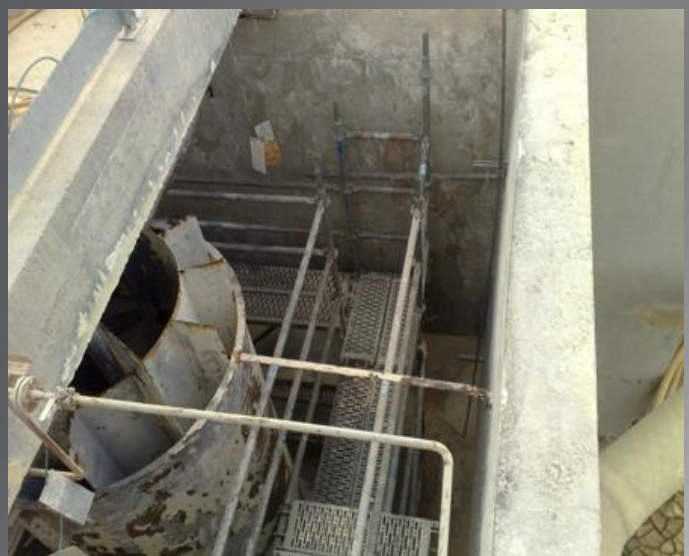
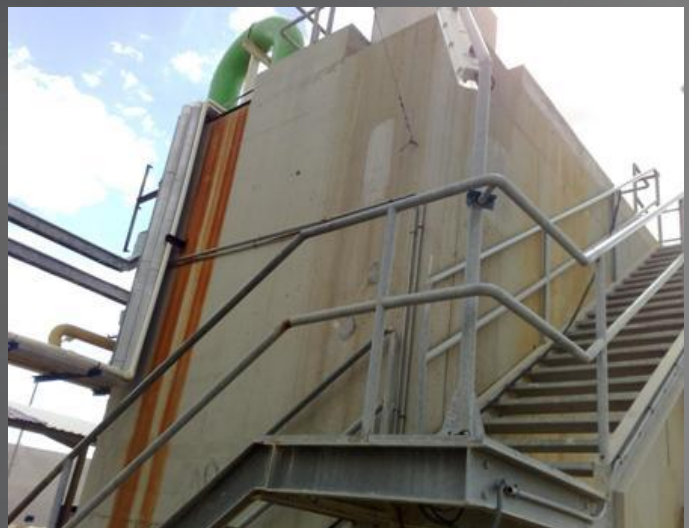
-The internal structure of the wall containing water chambers. An immediate solution was required for self-expel water from the outside of the decanter without damage the concrete structure.

Presence of metal mechanical parts inside the decanter with corrosion and deterioration

- The exterior structure of the decanter had leaks, damages of the concrete and deteriorations of the structure.

DESCRIPTION:

Reparation and protection of the interior and exterior of the structure of the decanter and the mechanical parts inside. (see bottom picture on the right).



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Process and systems of reparation and protection:

1º. Pathologies analysis. Study of the structure and parts, concrete composition, external degradative agents, characteristics of structures and surfaces, examination of the tank/decanter damages, exposure of the root causes of the degradation of surfaces: filtrations and defects of concrete and metal.

2º. Direct advice about the solution and action plan for the rehabilitation and reparation of the decanter and metal mechanical parts.

3º. Pretreatment. Part of the surface and inner structure of concrete reinforced by resin injection. fighting structural weaknesses found.

4º. Removing old coatings. With the structurally repaired surface, we proceed to remove the old coatings:



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- From the interior of decanter: These coatings were not prepared to provide a quality sealing stability inside the decanter, so it was necessary its complete elimination.

- Of metal mechanical parts inside the decanter: The old coatings did not confer protection required depending on parts and mechanical wear to which they are subjected with regular use.

- From outside of the decanter: outside old coatings are completely eliminated given their ineffectiveness for external protection of concrete walls.

5°. Sanitation. Elimination of detached concrete surfaces. Cleaning, healing and protecting the exposed armors.

Reparations with special mortars for the filling of the surface part of the concrete structure.

Removing rust / corrosion and repairing the structures degradations and metal mechanical parts inside the decanter with ceramic-metallic systems.



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6°. Advanced coatings. Manufacturing of an inside waterproof base with advanced coatings, by plasticizing the inside surface of a continuous watertight inner vessels manufactured in one piece. With this system implanted inside, water (from within the wall) is expelled from the outside of the decanter due to pressure of vessels made from the inside.

7°. Reparation and protection of mechanical parts. Repair metal parts inside the decanter with metal ceramic components and protection against corrosion with advanced coatings.

8°. Exterior protection of decanter. Once the dryness of concrete was checked, we proceeded to the outer concrete wall protection with advanced systems used for the interior, giving it permeable and breathable capabilities to output the retained water inside the wall.



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The structure of the systems in place was perfectly repaired and protected both on the inside and the outside conferring resistance properties against attacks of wastewater and environmental agents from inside and outside. Durability of the facility was increased and, to this day, continuous with full operation without plannings of short-term replacement. This situation, given the initial state found, would not have been possible, if they had not made the interventions with the implemented system.

