R2D2P Workshop on Costing
30 March - 3 April 2009
Quezon City, Philippines

Participants

CTT

Objective: Dismantle a Cooling Tower and evaluate the cost of the activities involved..

Actual Scenario:

This Cooling Tower was installed 1988 and operated for only five hours. No records of previous operational and radiological data was found. According with the information available of the CT is not expected to find any kind of contamination internal or external..

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1.- Description of the Cooling Tower

1.- The Cooling Tower is part of the secondary loop of the reactor cooling system. It sits on a concrete pad that is 5.8m square on the ground about 7.5 m north from the exterior wall of the reactor building.

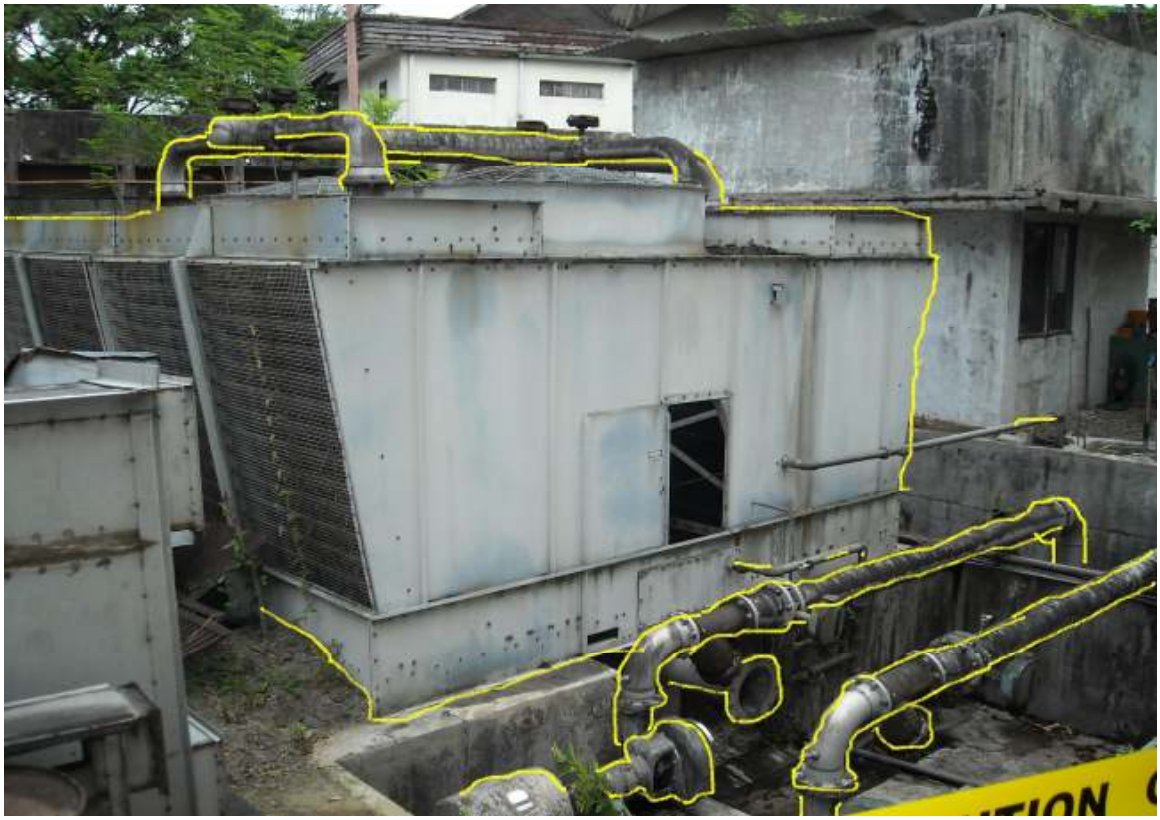
The main member of the Cooling Tower group of reactor components is an induced draft cross-flow type cooling tower with vertical air discharge, Model CFT(2)2421CRK by the Baltimore Aircoil Company. Inside the cooling tower, hot water from the secondary side of the reactor's heat exchanger is sprayed on the top of numerous vertically-hung sheets of PVC plastic. As the water falls vertically, atmospheric air is pulled horizontally across it by fans placed in the center of the cooling tower. Evaporation cools the water, which is collected at a basin that also serves as the base of the cooling tower. The cool water is returned to the heat exchanger to extract more heat generated by the reactor.

The cooling tower is 5.8 m long (at the sides, where air enters), 5.2 m wide (at the closed front and back), and 2.9 m tall. The cooling tower is made of galvanised and painted steel, and PVC plastic. It also contains two 20 HP electric motors, two belt drives, and two six-bladed aluminium fans each about 2.5 m in diameter. The dry weight of the cooling tower is about 6 tons.
The Cooling Tower group also contains the following:

a. two 40 HP electric motors driving two stainless-steel centrifugal pumps connected in parallel;
b. various lengths of 12-inch, 10-inch, 8-inch and 6-inch aluminium pipes and 2-inch galvanised iron pipes;
c. two 8-inch strainers, two 8-inch butterfly valves, two 8-inch check valves, four 6-inch butterfly valves, and various small valves (2-inch and 3/4-inch).

The 10-inch pipes carry water to and from the heat exchanger and the cooling tower. These pipes are in an open concrete trench sunk about 1.7 below ground level. A 12-inch pipe carries the cool water from the basin of the cooling tower to the pump inlets. This pipe is in a pit under the cooling tower basin. The pumps and motors are in a deeper pit adjacent to the south end of the cooling tower. The pump outlets are connected by 8-inch pipes and a series of strainers, butterfly valves, and check valves to the 10-inch pipe that returns the water to the heat exchanger.

2.- The components to be dismantled are indicated in the following pictures:



2.- Phase 1: Planning

2.1 Prepare the Initial Decommissioning Plan
2.2 Aproval of the Initial Decommissioning Plan by the Management Staff
2.3 Aproval of the Initial Decommissioning Plan by the Regulatory Body
2.4 Meeting among Regulatory Body and PNRI.
2.5 Aproval of the Final Decommissioning Plan by the Management Staff
2.6 Aproval of the Final Decommissioning Plan by the Regulatory Body
2.7 Present the Final Decommissioning plan to the PNRI personnel

3.- Phase 2: Monitoring before dismantling

A calibrated portable rate meter with NaI detector was used for the previous monitoring. The following pictures how it was performed. Monitoring pipes and elbows, flat surface, soil, strainers and reducers.

4.- Phase 3: Dismantling

Aluminium
Single components
Plastic
CT Skeleton

5.- Phase 4: Monitoring after Dismantling

Monitoring of pipes and elbows
Monitoring of the flat suerface
Monitoring of pump
Monitoring of soil
Monitoring of strainers
Monitoring of reducer

6.- Phase 5: Segregation of Contaminated and non Contaminated items

Sorting and fragmentation of materials during dismantling
Contaminated item
Non-contaminated item

7.- Phase 6: Transportation of Waste

Transport of all material to Waste Management Facility
Aluminium pipe
Single components
Plastic
CT Skeleton

Transport of material to workshop for clearance:
Aluminium pipe
Single components
Plastic
CT Skeleton

8.- Phase 7: Clearance of the Cooling Tower Site

Onsite measurement of the flat surface
Cleaning(vaccum) strenches

9**.- Phase 8 . Release from Regulatory Control**

Prepare the Decommissioning Report
Approval of the Decommissioning Report by Management Staff
Approval of the Decommissioning Report by the Regulatory Body
Release the Cooling Tower site from regulatory control