

Although it is possible to confirm that there are leaks of air and exhaust gases around the boilers, and leaks of steam around the turbines, there is no way of measuring the amount of the leaks. Also, because electrical current data records are not maintained for auxiliaries such as fans and pumps, it is impossible to calculate the additional auxiliary power that is required due to the leaks. However, from the progression of the house consumption for the power plant shown in Figure 5.1-10, it can be seen that the house consumption is rising only slightly compared to the visible aging of the equipment.

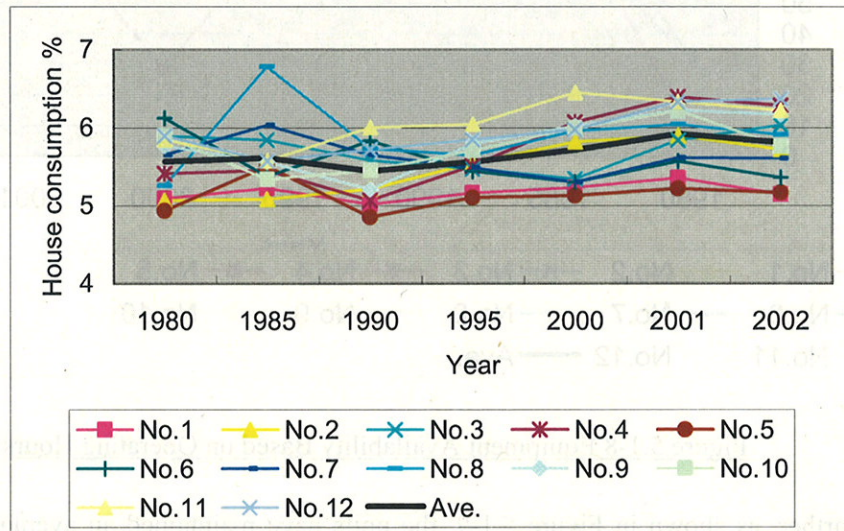


Figure 5.1-10 House Consumption over Time

As shown in Picture 5.1-13 up to Picture 5.1-24, when the outside temperature is low, there are many opportunities to visually confirm in the area of the turbines that a large quantity of steam is leaking. By addressing these leaks, the house consumption can be decreased and it is highly possible that the units' efficiency can be improved.



Picture 5.1-13 Steam Leaking from Turbine Area

From observing the maintenance work being performed on electrical equipment, including the thorough winding repair work performed during the disassembly inspection of a fan motor, it is clear that employees have a high level of technical skill.

b. Important Inspection Unit

In discussions with DC "TASHTPP" representatives, it was decided that we would emphasize unit 6 in our inspection. According to the DC "TASHTPP" representatives, unit 6 does not have any particularly pressing problems; it is a very average facility. This can be confirmed by the number of emergency shutdowns shown in Figure 5.1-3. From 2000 to 2002, there were seven emergency shutdowns (none in 2000), which are broken down as follows.

- 2001
  - ① Overheated No. 4 bearing, turbine generator
  - ② Wear, No. 3 bearing, turbine generator
  - ③ Hydrogen leak from shaft seal part due to mechanical wear of No. 5 bearing packing, turbine generator
  - ④ Hydrogen leak from shaft seal part of overused No. 6 bearing packing, turbine generator
- 2002
  - ⑤ Hole in angle joint for piping connecting to the casing of the primary superheater spray desuperheater, due to overuse.

- ⑥ Defective shaft for B-FDF
- ⑦ Hole in air heater lubricant pump outlet

Examination of these causes of emergency shutdowns reveals that most were caused by consumable parts having been used past their service life, and the deterioration of parts due to continuous operation. If consumable parts had been replaced and parts maintained regularly during periodic maintenance work, problems significant enough to cause emergency shutdowns would probably not have occurred.

The results of a visual inspection of unit 6 are outlined below, and photos of the unit 6 boiler equipment in operation, as well as the area around the unit 1 boiler furnace and turbine blades disassembled for inspection, are provided beginning with Picture 5.1-14. Because unit 6 was operating, and it was impossible to see the inside of the boiler or the turbine, we also examined unit 1, which was at the time undergoing periodic maintenance. We followed the same approach with regard to the electrical control equipment.

It can be said of all the facilities, not only unit 6, that cleaning is not being properly performed. Although the equipment is old, it often seems older than it is because it is not kept tidy. While it may seem that focusing only on keeping the equipment running is a low-cost option, it is hard to say that this is a good long-term strategy, as it delays detection of minor changes and problems in the equipment.

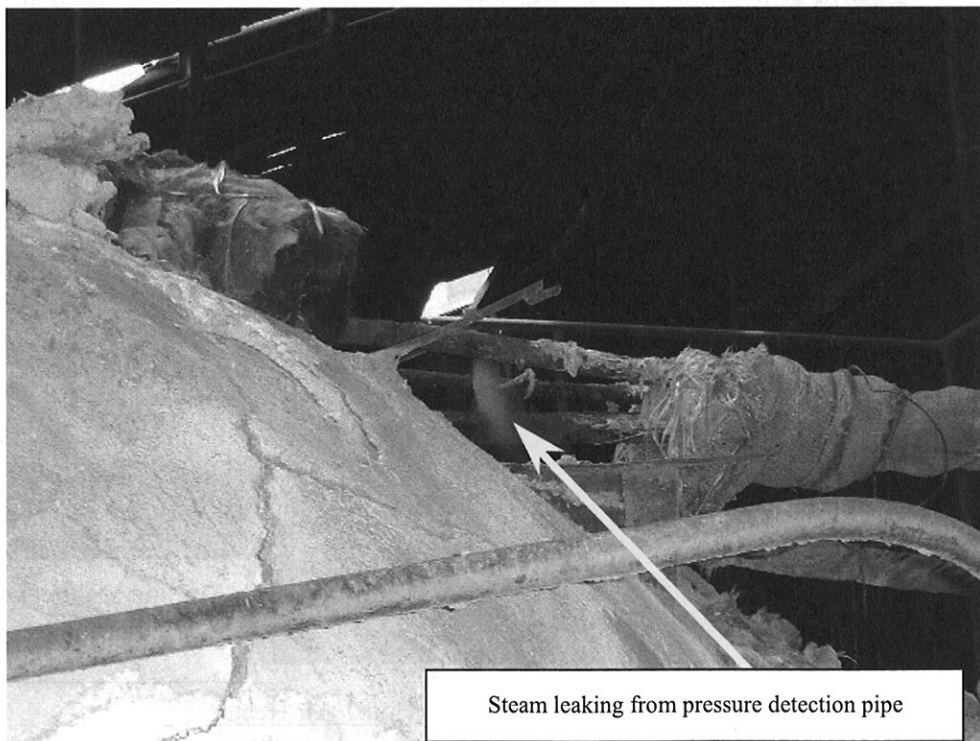
(a) Mechanical Equipment

It can be said generally of the mechanical equipment that it is aging and looks it. Functionally, deterioration is noticeable, as discussed above, in the form of air and gas leaks from various parts of the boiler equipment, and serious decreases in condenser vacuum levels and steam leaks in the turbine equipment. The measures described above are needed to resolve these problems.



Picture 5.1-14 Cracks in Unit 6 Boiler Ceiling

(The red heat of the furnace is visible.)



Picture 5.1-15 Top of Unit 6 Boiler Drum