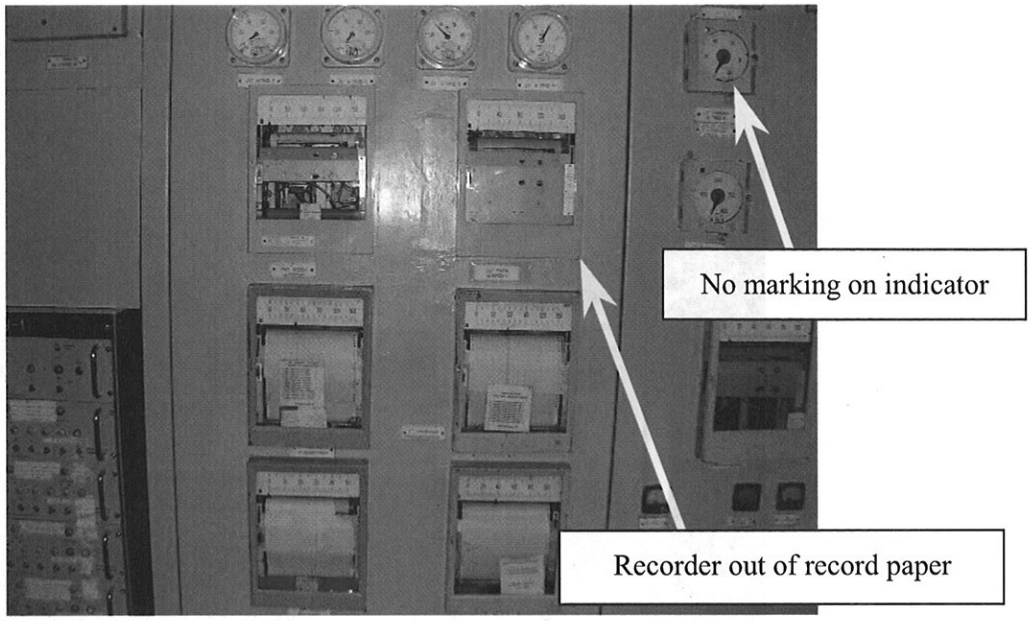
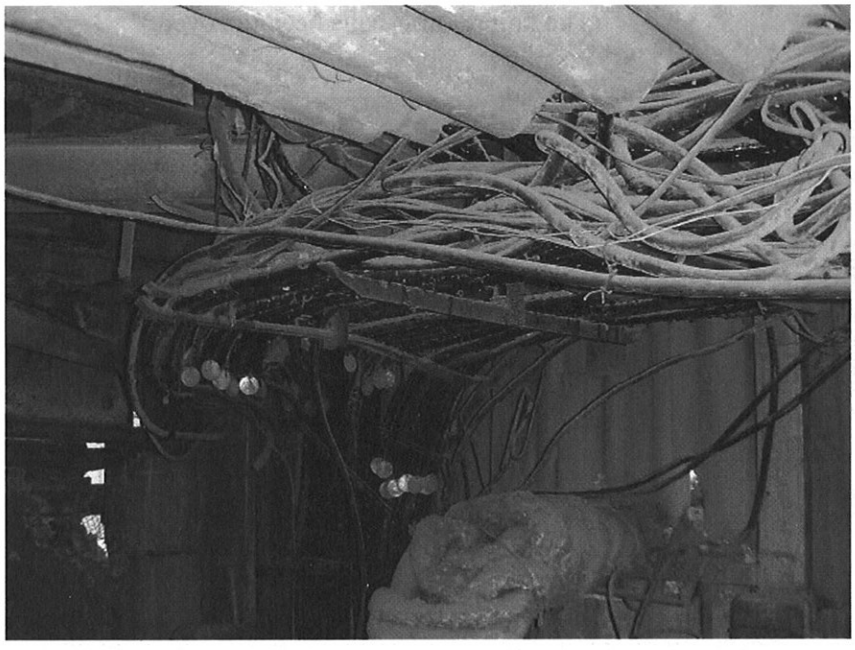
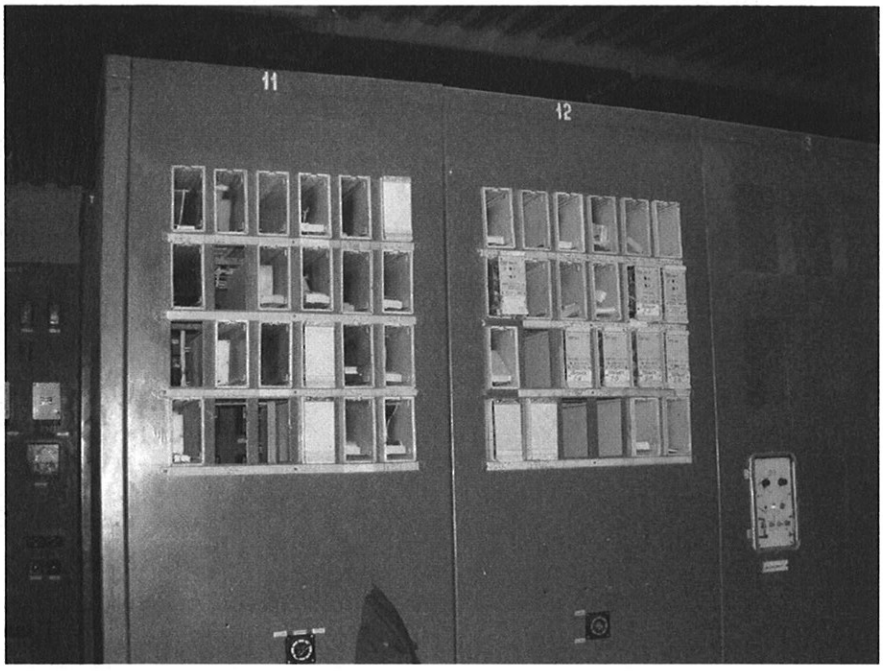


Picture 5.1-21 Unit 6 Central Control Room Indicating and Recording Instruments



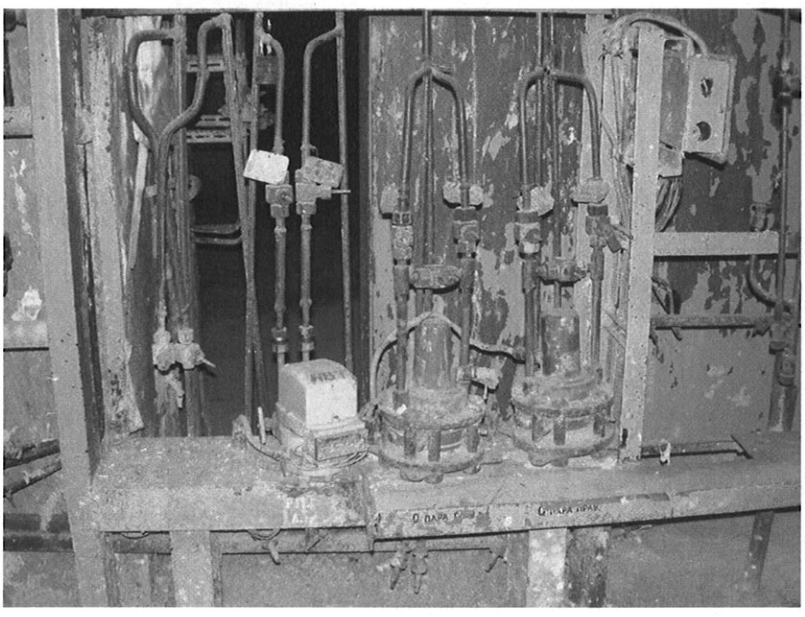
Picture 5.1-22 Cables Near Unit 6 Burner

(The cables are dusty and deterioration is evident on the outer covering.)



Picture 5.1-23 Regulator Panel

(The failure cards have been removed.)



Picture 5.1-24 Local Instrument Panel/Detection Pipes

(Not maintained)

5.2 Proposal for Maintaining and Managing the Existing Plant

5.2.1 Selection of Facilities for Maintenance

In Uzbekistan, the currency changed at when the country became independent from the USSR in 1991, so it is not possible to simply compare the past and present unit cost of power generation. However, as Table 5.2-1 and Figure 5.2-1show, there has been a dramatic increase in the cost of generating electricity and the accompanying unit generation cost since 1995. It seems that the reason for the increase is not a dramatic rise in the particular costs associated with power generation, but rather a general rise in prices due to inflation. As Figure 5.2-2shows, there has not been a significant change in the proportion of generating costs represented by various inputs from year to year. This suggests that the increase in the unit generation cost is not due to increased maintenance costs required by equipment problems, nor a decline in operating hours, but rather inflation.

The cost of fuel is the largest factor in the unit generation cost. Its proportionate weight has decreased somewhat in recent years, but it is still more than 85%. Because the proportionate weight of fuel costs is high, the unit generation cost is responsive to fluctuation in the price of fuel. The proportionate weight of personnel costs is gradually increasing, and this trend is expected to get stronger. In contrast, the proportionate weight of maintenance costs is decreasing slightly, although the costs themselves are increasing significantly like the other costs. This decrease shows that insufficient funds are being allocated to equipment maintenance, which presents a problem in terms of keeping the equipment in sound condition.

Table 5.2-2 Unit Generation Costs and Breakdown

			1995	1996	1997	1998	1999	2000	2001	2002
Unit Price		Sum/kWh	0.208	0.582	0.837	1.213	1.601	1.925	2.679	3.902
Breakdown	Personnel	Sum*	28,799.6	69,557.2	151,470.7	249,634.3	372,111.4	677,369.9	940,991.7	1,376,013.1
		%	1.29%	1.23%	1.80%	2.47%	2.95%	3.67%	3.34%	3.42%
	Maintenance	Sum	130,264.6	350,819.8	674,400.3	675,142.7	981,329.0	806,379.6	1,188,147.8	1,859,044.5
		%	5.82%	6.18%	8.02%	6.68%	7.78%	4.37%	4.22%	4.62%
	Fuel	Sum	2,017,641.9	5,198,108.4	7,460,445.4	9,054,763.9	11,023,426.7	16,278,764.3	23,699,804.7	35,291,126.9
		%	90.11%	91.61%	88.68%	89.59%	87.38%	88.25%	84.23%	87.67%
	Other	Sum	126,767.5	127,356.9	238,530.8	683,316.9	2,306,913.5	1,726,518.4	126,767.5	127,356.9
		%	2.79%	0.98%	1.51%	1.26%	1.89%	3.70%	8.20%	4.29%

Note: *Sum: Uzbekistan currency

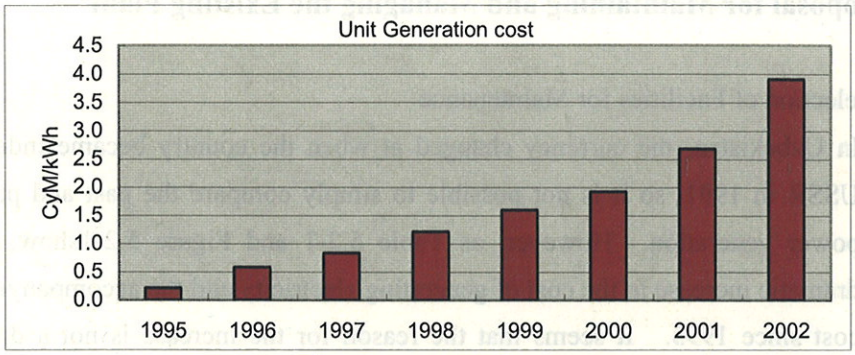


Figure 5.2-1 Unit Generation Costs over Time

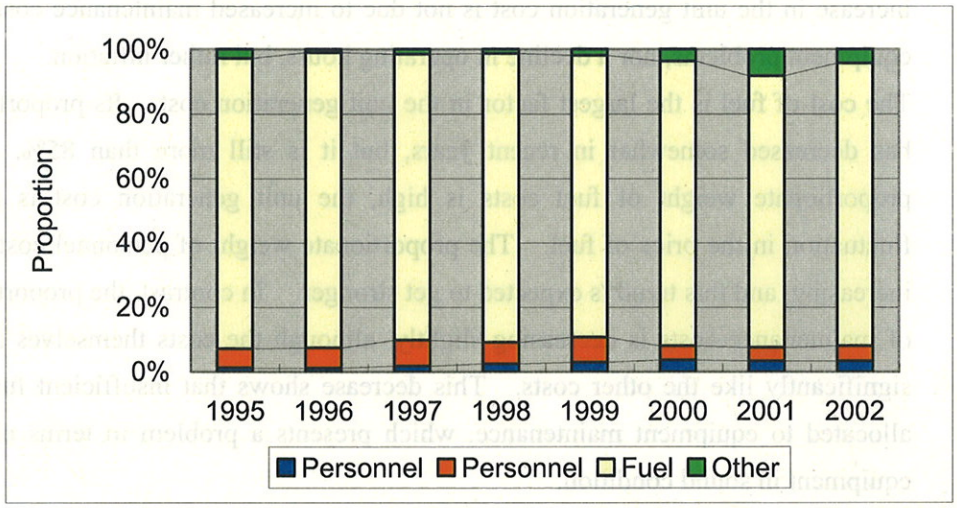


Figure 5.2-2 Proportionate Breakdown of Unit Generating Costs

In order to reduce the unit generation cost, secure a profit and ensure sound financial operation, it is desirable to keep the generating efficiency of the generating equipment high and achieve stable operation with high availability throughout the year. In order to achieve this, the causes of reduced efficiency must be eliminated and the incidence of sudden equipment failures must be reduced.

A particularly significant cause of decreased unit efficiency at the DC "TASHTPP" is the decrease in condenser vacuum levels, followed by the increase in house consumption. To address these problems of decreased efficiency, it is necessary to improve the efficiency of the units as a whole, allocating the savings on fuel achieved by the efficiency improvements to equipment maintenance.

An analysis of the effects of such improvements, based on 2002 operating data for unit 6 obtained from the DC "TASHTPP" yields the following:

- Annual power generation: 879.3×10^6 kWh