UK-BRAZIL INTERACTION MEETING ON COOPERATION IN FUTURE ENERGY SYSTEMS INOVATION

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"BRAZILIAN HYDRO STORAGE"

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APRESENTAÇÃO

- Brazilian Hydro System
- Características da Geração
- Planejamento da Operação Energética
- Modelos de Otimização
  - Determinísticos x Estocásticos
- Estudos de Caso
- Princípio do Equivalente Certo
- Conclusões

BRAZILIAN HYDRO SYSTEM

BRAZILIAN HYDRO SYSTEM

BRAZILIAN TRANSMISSION SYSTEM

Sistema Interligado Brasileiro

HYDRO PRODUCTION FUNCTION

$$P = k.\eta(h_l, q).h_l.q.n$$

k	constant
H	turbine-generator efficiency
h_l	net water head
q	water discharge
n	number of generating units in operation

THERMAL COST FUNCTION

Input-output curves

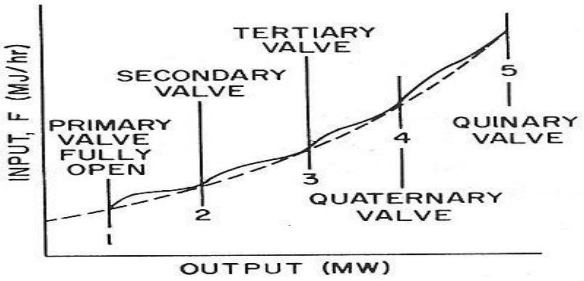

Fig. 2.1 Thermal unit input–output curve.

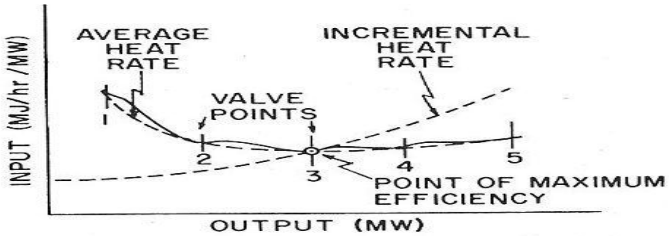

Fig. 2.2 Typical thermal unit heat rate curve.

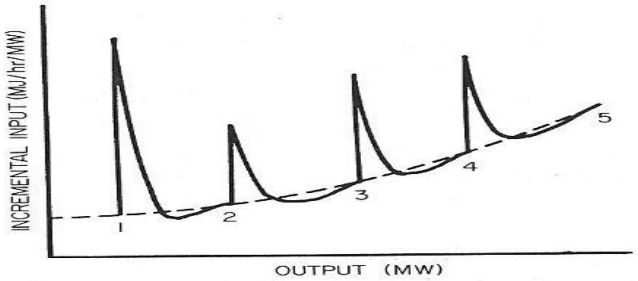

Fig. 2.3 Typical thermal unit incremental heat rate curve.

THERMAL COST FUNCTION

Typical coefficients

$$c(p) = \alpha + \beta p + \gamma p^2 \quad (GJ/hr)$$

TABLE 2.2

Typical Cost Coefficients

Unit size (MW)	Coal			Oil			Gas		
	α	β	γ	α	β	γ	α	β	γ
50	49.92	10.06	0.0103	52.87	10.47	0.0116	53.62	10.66	0.0117
200	173.61	8.67	0.0023	180.68	9.039	0.00238	182.62	9.19	0.00235
400	300.84	8.14	0.0015	312.35	8.52	0.00150	316.45	8.61	0.00150
600	462.28	8.28	0.00053	483.44	8.65	0.00056	490.02	8.73	0.00059
800	751.39	7.48	0.00099	793.22	7.74	0.00107	824.4	7.73	0.00117
1200	1130.8	7.47	0.00067	1194.6	7.72	0.00072	1240.32	7.72	0.00078

HYDROTHERMAL COORDINATION