EEE 251 – Unit Commitment -7- (r) NOT IN TEXT!

Note: Average production cost or (Full load Average Cost) is calculated as follows;

$$F_{lave(i)} = \frac{F_{C(i)} \times [\text{Input/output Charc.}]\big|_{P=P_{max(i)}} + N_{l(i)}}{P_{max(i)}}$$

where;
$F_{C(i)}$ = Fuel Cost of unit(i)
$N_{l(i)}$ = No load cost of unit (i)
$P_{max(i)}$ = max output of unit (i)

So; if $H_1 = 510 + 7.2 P_1 + 0.00142 P_1^2$
$F_1 = 1.1$ \$/MBTu

$$F_{l_{ave}(1)} = 9.79 = \frac{1.1[510 + 7.2(600) + 0.00142(600)^2] + \emptyset}{600}$$

EXAMPLE 5D Construct a priority list for the units of Example 5A. (Use the same fuel costs as in Example 5A.) First, the full-load average production cost will be calculated:

$H_3 = 78 + 7.97 P_3 + 0.00482 P_3^2$
$F_3 = 1.2$ \$/MBTu

Unit	Full Load Average Production Cost (₹/MWh)
1	9.79
2	~~9.48~~ 9.401
3	11.188

$$F_{l_{ave}(3)} = 11.188 = \frac{1.2[78 + 7.97(200) + 0.00482(200)^2] + \emptyset}{200}$$

A strict priority order for these units, based on the average production cost, would order them as follows:

$$F_{l_{ave}(2)} = 9.401 = \frac{1.0[310 + 7.85(400) + 0.00194(400)^2] + \emptyset}{400}$$

Unit	₹/MWh	Min MW	Max MW
2	~~9.48~~ 9.401	100	400
1	9.79	150	600
3	11.188	50	200