Table 7.3. Table of calculation of efficiencies of the July 1958 typical storm in the San-Hua region on the Yellow River

Daily maximum rainfall		*1 000-hPa dewpoint* T_d *(°C)*	*Precipitable water W (mm)*			*Efficiency* η *(%/h)*	
P (mm)	*I (mm/h)*		*1 000 hPa – 200 hPa*	*1 000 hPa 655 m*	*655 m – 200 hPa*	*1 000 hPa – 200 hPa*	*655 m – 200 hPa*
(1)	(2)	(3)	(4)	(5)	(6) = (4) – (5)	(7) = (2)/(4)	(8) = (2)/(6)
61.7	2.57	24.4	76.8	13.5	63.3	3.35	4.06

Table 7.4. Calculation of moisture and efficiency amplifications of the July 1958 typical storm in the San-hua Region on the Yellow River

Case	*1 000 hPa dewpoint* T_d *(°C)*	*Precipitable water W (mm)*		*Efficiency* η *(%/h)*		*Amplification*		
		1 000 hPa – 200 hPa	*655 m – 200 hPa*	*1 000 hPa – 200 hPa*	*655 m – 200 hPa*	K_W	K_η	$K_{W\eta}$
(1)	(2)	(3)	(4)	(5)	(6)	(7) = 76.5/63.3	(8) = 7.94/4.06	(9) = (7) × (8)
Design	26.5	92.0	76.5	6.60	7.94	1.21	1.96	2.37
Typical	24.4	76.8	63.3	3.35	4.06			

7.4 TRANSPOSITION MODEL METHODS

7.4.1 Applicable conditions

This method is applicable to cases in which data on an extraordinary storm observed are available for regions around the design watershed. The rainfall and the spatio-temporal distribution of the storm are moved to the design watershed with necessary corrections (adjustments). It is then used as a typical storm, which is maximized properly to determine PMP.

7.4.2 Selection of transposed storms

The selection of transposed storms should follow the conclusions (Table 7.1) of the analysis on qualitative characteristics of PMP storm models in the design watershed as outlined in section 7.2.5. Here, the focus should be on weather causes.

In deducing qualitative characteristics, if the conclusion is, for example, that the weather system of PMP is typhoons, the transposed storms should be selected from typhoon rainstorms. Likewise, if the deduced weather system of PMP is the frontal surface or the shearing vorticity, then the transposed objects should selected from frontal storms or shearing vorticity storms.

7.4.3 Transposition possibility analysis

Transposition possibility analysis forms the basis of storm transposition. In generalized estimation, there are two methods for solving transposition possibility issues: the first is compartmentalizing meteorological homogeneous zones; the second is performing studies for specific extraordinary storms and determining their transposable ranges, that is, drawing transposition borderlines (Hansen and others, 1988). When performing PMP estimation for a particular design watershed, any research results associated with the above two methods should be utilized; if there are no such results, specific analysis on the design watershed needs to be done. The transposition possibility problem is solved by analysing and comparing similarities – in terms of climate, weather, geography and topography – between the design watershed and the

Table 7.5. Five-day PMP in the San-Hua region on the Yellow River

	Duration (days)					*Total*
	1	*2*	*3*	*4*	*5*	
Areal mean rainfall (mm)	17.1	80.8	146.2	31.0	71.1	346.2