also extended into the subcooled boiling regime by setting the Reynolds number factor to one.

The post-CHF regime consists of models for transition film boiling, film boiling, and single-phase vapor convection. The transition film boiling model in RELAP5/MOD2 was changed. A description of the change is contained in Section 4.4.3. The film boiling model has the form:

$$Q_{wf} = h_{wf} A_w F_f (T_w - T_f) / V \quad (3\text{-}30)$$

$$Q_{wg} = h_{wg} A_w (1 - F_f)(T_w - T_g) / V \quad (3\text{-}31)$$

where A_w is the total wall heat transfer area and F_f is the fraction of wall surface contacted by the liquid. For single-phase vapor convective heat transfer, the wall is assumed to be dry and the heat transfer area between the wall and the liquid is negligible and the heat transfer from the wall to the vapor is given by the expression.

$$Q_{wg} = h_{wg} A_w (T_w - T_g) / V \quad (3\text{-}32)$$

The Dittus–Boelter correlation is used for h_{wg}.

In the condensation regime, heat transfer to the wall from liquid and vapor is dependent on the flow regime. Heat transfer from liquid to the wall is modeled by convection in the low void regime and heat transfer from vapor to the wall is modeled by condensation in the high void regime. A void fraction weighting scheme is used to include the effects of condensate in the heat transfer from liquid to the wall for which the expression is

$$Q_{wf} = [(1-\alpha_g)h_{Dittus-Boelter}(T_w - T_f) + \propto_g h_{cond}(T_w - T_g)]A_w / V \qquad (3\text{-}33)$$

where h_{cond} is the condensation heat transfer coefficient. Heat transfer from vapor to the wall is modeled by convection and expressed as

$$Q_{wg} = [\propto_g h_{conv}(T_w - T_g)]A_w / V \qquad (3\text{-}34)$$

The correlations used to calculate wall heat transfer are summarized in Section 4.2 of Reference 3.10.2.

3.2.2 Interphase Mass Transfer

The interface mass transfer is modeled according to the thermodynamic process, interphase heat transfer regime and flow regime. After the thermodynamic process is decided, the flow regime map discussed in Section 3.1 of Reference 3.10-1 is used to determine the phasic interfacial area and to select the interphase heat transfer correlation.

The mass transfer model is formulated so that the net interfacial mass transfer rate is composed to two components which are the mass transfer