**Supplementary for Paper “Coordinated Scheduling of Virtual Power Plants Driven by Unbalanced Distribution LMP”**

Appendix A

The Lagrange function *L* of the second level problem is expressed as follows

 (A1)

By substituting stationarity conditions in (9a)-(9h) into (A1), the Lagrange function *L* can be further expressed as

 (A2)

In strong duality theory, it states that the primal problem and its dual problem have the same optimal value when the primal problem is convex. Then the Lagrange function in (A2) satisfy . Therefore, the bilinear terms in (8a) can be deduced, expressed as

 (A3)