

LN X M.B. + IPR PRODUCTION FORECAST STRATEGY

- ① Multiple RFUs
- ② All wells produce from all RFUs
- ③ Average well | Each RFU is "uniform" | Same Prof all wells
- ④ Gas Reservoir or Oil Reservoir all RFUs
- ⑤ Discretize in time Δt (1 month | 1 year)
- ⑥ Specify Target Rate of Wells } As reservoir simulator work
 - (a) Lower FBHP Prof constraint
 - (b) Specify $q_{wf}(t)$: Simpler

M.B. M.B.
 $R_p(P_R)$ $V_p(P_R)$
 SGD: $P_R(N_p)$ GC: $P_R(G_p)$

RFU-1: MB $P_R(Q_P)$ | $\frac{1}{\epsilon}$ IPR: $q_w(P_R, P_{wf})$

t	Target q_w	Min P_{wf}	Q_{pt}
$t_0=0$			
t_1			
t_2			
\vdots			

Δt

* P_R	M.B. Q_P	IPR q_w	$(N_w) q_w$	$q_w \Delta t$	$\sum \Delta Q_P$	*

*new columns
 M.B. (SGD): $Q_{p2} = Q_p$
 $R_p(P_R) \Delta Q_{p2} = \Delta Q_p \bar{R}_p$ $Q_{p2} = \sum \Delta Q_{p2}$
 M.B. (G.C): $Q_{p2} = N_p$
 $r_p(P_R) \Delta Q_{p2} = \Delta Q_p \bar{r}_p$ $Q_{p2} = \sum \Delta Q_{p2}$

Simpler to specify P_{wf}
 \Rightarrow accept q_w, q_i

$N_{ts} \cdot N_{RFU}$
 $N_{ts} \cdot N_{RFU} + N_{ts}$
 $N_{ts} (N_{RFU} + 1)$
 if q_w targets
 are given

Variables (Unknown) : $P_R(t)$

Objective (Target) : Minimize

$$\sum_{i=1}^{N_{RFU}} \sum_{j=1}^{N_{ts}} \left(\frac{Q_P^{calc} - Q_P^{MB}}{Q_{p,ref}} \right)^2$$

(a) Q_P^{MB}
 *(b) Q_{pu}