The governing equations used in the development of the control loops have not been given in the main paper due to space limitations. They are listed below:

Stage 1:

CPG = DECPL –AECPL ----------[1]

CTRATE = CPG * (1/ Tr) + FGCFR ----------[2]

CTCRATE = CTRATE * (1/ (1 + Tdt * S)) ----------[3]

AECPL = (1/S) * (CTCRATE – PGCFR) ----------[4]

FGCFR = PGCFR * (1/ (1 + Ta * S)) ----------[5]

ALCA = AECPL * (1/ (1 + Tdr * S)) ----------[6]

AECPL/PGCFR = (Tr) * ((Tdt+ Ta)*S + (Tdt*Ta*S2)) / ((1 + Ta*S)(1 + Tr*S + Tr* Tdt*S2)) ----------[7]

CTRATE/ PGCFR = (1+ (Tr+ Ta)*S)/ ((1 + Ta*S)(1 + Tr*S + Tr*Tdt*S2)) ----------[8]

Stage 2:

CPG = DECPL –AECPL ----------[9]

CTRATE = CPG * (1/ T_r) + FGCFR ---------- ------[10]

CTCRATE = CTRATE * (1/ (1 + T_{dt} * S)) ----------[11]

AECPL = (1/S) * (CTCRATE – PGCFR) ----------[12]

FGCFR = PGCFR * (1/ (1 + T_a * S)) ----------[13]

SKG = AECPL - ALCA ----------[14]

RRATE = SKG * (1/ T_s) ----------[15]

RCRATE = RATE * (1/ (1 + T_{rd} * S))----------[16]

TRATE = RCRATE + FSKFR ----------[17]

TCRATE = TRATE * (1/ (1 + T_{td} * S)) ----------[18]

ALCA = (1/S) * (TCRATE – PSKFR)----------[19]

FSKFR = PSKFR * (1/ (1 + T_{sl} * S)) ----------[20]

Also, the graphs connected to Comparative Analysis could not be included in the main paper due to space limitation and hence we give it below for the perusal of reviewers.

Comparative Analysis of GECOPM (Stage-1)

The simulation results depict the relevance of the four time-based policy parameters. The superimposition of the variation of the policy parameters for AECPL, CTCRATE, and ALCA is given in figures 14, 15 and 16 respectively. The competence training delay time (T_{dt}) plays a crucial role in the system dynamics as it affects the stability of AECPL & CTCRATE.

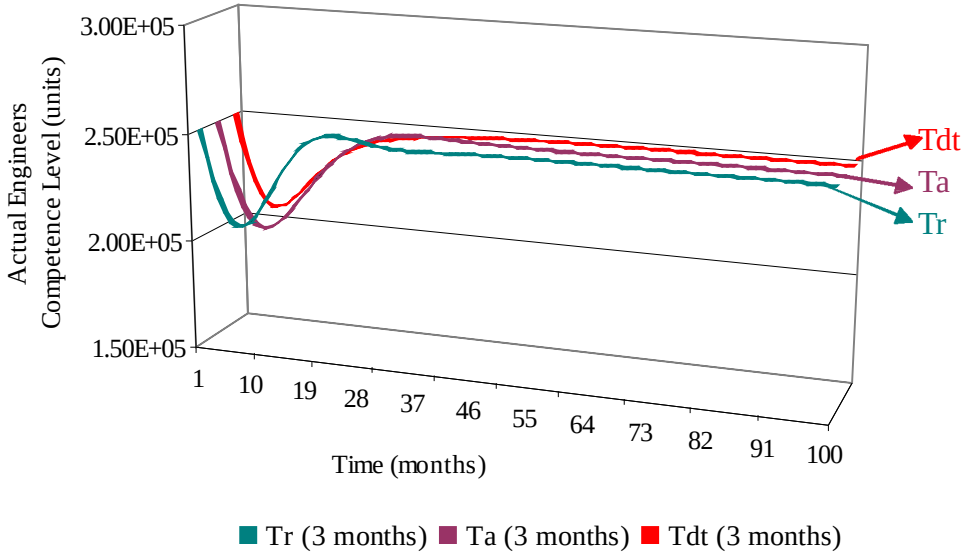

Figure 14 Superimposition of AECPL in Stage-1 (GECOPM)

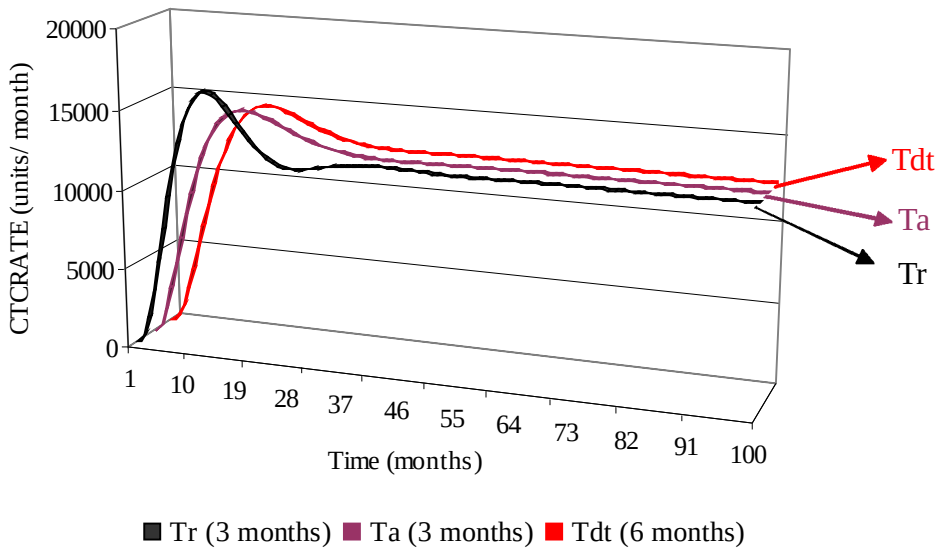

Figure 15 Superimposition of CTCRATE in Stage-1 (GECOPM)

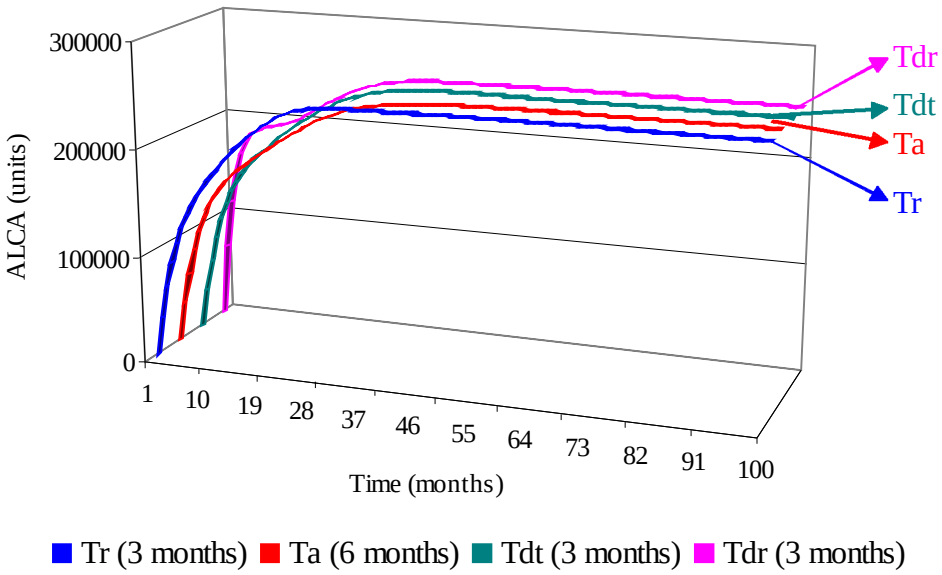

Figure 16 Superimposition of ALCA in Stage-1 (GECOPM)

Comparative Analysis of PECOPM (Stage-2)

The comparative analysis of practicing engineers' competence pool model PECOPM is given in Figures 17 and 18. The simulation results of have revealed the fact that all the six policy parameters chosen have considerable influence on the system dynamics of PECOPM.

The Skill Gap Recovery Rate (T_s) plays the crucial role in the system dynamics of PECOPM as it affects the stability of the competence pool absorption. This is because higher T_s values take longer time to settle, more time for rise and result in lower peak value in comparison with other policy parameters. Hence, for better results this is the key policy parameter, which demands a significant attention and control.

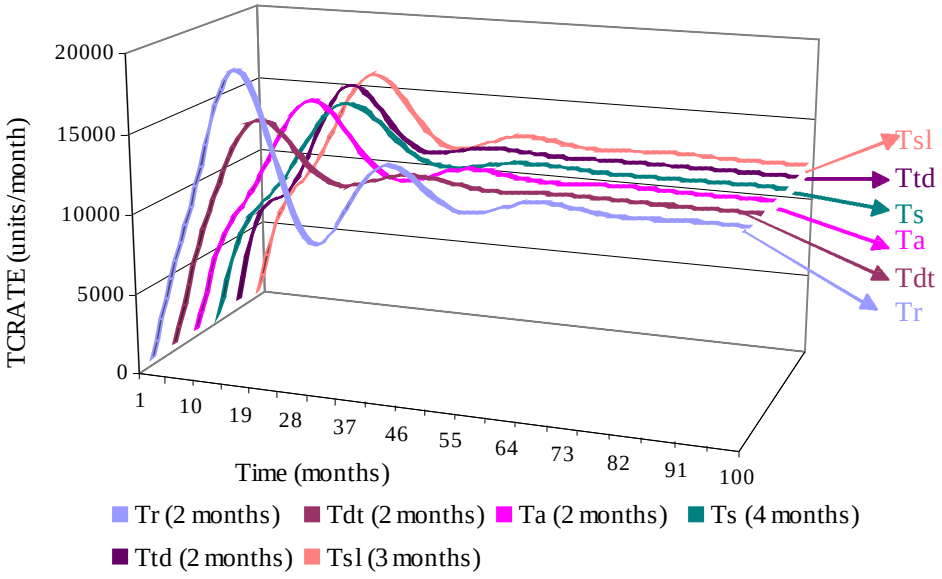

Figure 17: Superimposition of TCRATE in PECOPM

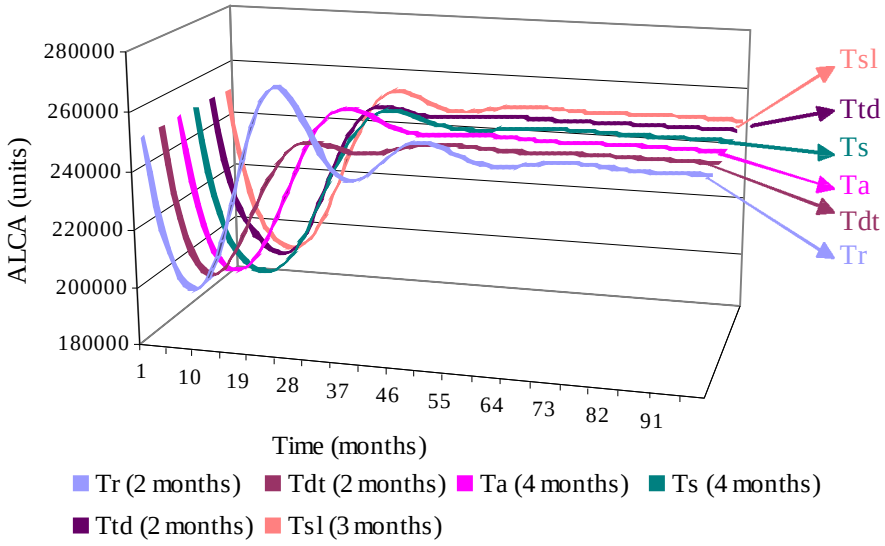

Figure 18: Superimposition of ALCA in PECOM