function SELECT-SUB-GOAL(*plan*) **returns** *plan, precondition conjunct*

pick a plan step S_{need} from STEPS(*plan*) with a precondition conjunct c that has not been achieved
if c is a universally quantified expression **then**
return S_{need}, EXPANSION(c)
else if c is a disjunction $c_1 \vee c_2$ **then**
return S_{need}, **choose**(c_1, c_2)
else return S_{need}, c

---

procedure CHOOSE-OPERATOR(*plan, operators,* S_{need}, c)

choose a step S_{add} from *operators* or STEPS(*plan*) that has c_{add} as an effect
such that u = UNIFY(c, c_{add}, BINDINGS(*plan*))
if there is no such step **then fail**
$u' \leftarrow u$ without the universally quantified variables of c_{add}
add u' to BINDINGS(*plan*)
add $S_{add} \xrightarrow{c} S_{need}$ to LINKS(*plan*)
add $S_{add} \prec S_{need}$ to ORDERINGS(*plan*)
if S_{add} is a newly added step from *operators* **then**
add S_{add} to STEPS(*plan*)
add *Start* $\prec S_{add} \prec$ *Finish* to ORDERINGS(*plan*)

---

procedure RESOLVE-THREATS(*plan*)

for each $S_i \xrightarrow{c} S_j$ **in** LINKS(*plan*) **do**
for each S_{threat} **in** STEPS(*plan*) **do**
for each c' **in** EFFECT(S_{threat}) **do**
if SUBST(BINDINGS(*plan*), c) = SUBST(BINDINGS(*plan*), $\neg c'$) **then**
choose either
Promotion: Add $S_{threat} \prec S_i$ to ORDERINGS(*plan*)
Demotion: Add $S_j \prec S_{threat}$ to ORDERINGS(*plan*)
Confrontation: **if** c' is really of the form (c' *when* p) **then**
CHOOSE-OPERATOR(*plan, operators*, S_{threat}, $\neg p$)
RESOLVE-THREATS(*plan*)
if not CONSISTENT(*plan*) **then fail**
end
end
end