

```

zero
    GenTrq = 0.0
    ELSEIF ( GenSpeedF < VS_Rgn2Sp ) THEN ! We are in region 1 1/2 - linear
ramp in torque from zero to optimal
    GenTrq = VS_Slope15*( GenSpeedF - VS_CtInSp )
    ELSEIF ( GenSpeedF < VS_TrGnSp ) THEN ! We are in region 2 -
optimal torque is proportional to the square of the generator speed
    GenTrq = VS_Rgn2_K*GenSpeedF*GenSpeedF
    ELSE ! We are in region 2 1/2
- simple induction generator transition region
    GenTrq = VS_Slope25*( GenSpeedF - VS_SySp )
    ENDIF

    ! Saturate the commanded torque using the maximum torque limit:
    GenTrq = MIN( GenTrq , VS_MaxTq ) ! Saturate the
command using the maximum torque limit

    !Initialize saved variables on first call to subroutine
    IF ( Initialize2 ) THEN
        Initialize2 = .FALSE.
        LastGenTrq = GenTrq ! Initialize the value of LastGenTrq
on the first pass only
    ENDIF
ENDIF

    ! Saturate the commanded torque using the torque rate limit:
    TrqRate = ( GenTrq - LastGenTrq )/ElapTime ! Torque rate
(unsaturated)
    TrqRate = MIN( MAX( TrqRate, -VS_MaxRat ), VS_MaxRat ) ! Saturate the torque
rate using its maximum absolute value
    GenTrq = LastGenTrq + TrqRate*ElapTime ! Saturate the command
using the torque rate limit

    ! Reset the values of LastTimeVS and LastGenTrq to the current values:

    LastTimeVS = ZTime
    LastGenTrq = GenTrq

    IF ( controlDebug ) THEN
        WRITE(*,*) 'Time=',ZTime,'TqCount=',TqCount,&
'GenTrq=',GenTrq,'HSS_Spd=',HSS_Spd,'GenSpeedF=',GenSpeedF
        TqCount = TqCount+1
    ENDIF

ELSE
    GenTrq = LastGenTrq
ENDIF

IF ( GenTrq > 0.0 ) THEN
    ElecPwr = GenTrq*HSS_Spd*GenEff
ELSE
    ElecPwr = GenTrq*HSS_Spd/GenEff
ENDIF

RETURN
END SUBROUTINE UserVSCont

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