

BATTERY CHARGE CONTROL WHICH APPROACH IS BEST?

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CHARGE TEMPERATURE (HIGHER STRESS, SHORTER LIFE)

- LIFE
 - BENIGN CHARGING CAN RESULT IN LOWER DISCHARGE VOLTAGE AND CAPACITY (POORER PERFORMANCE)
 - BENIGN, OR LOW STRESS CHARGING, USUALLY IMPLIES LESS OVERCHARGE AT LOWER RATES WITH LOWER END OF CHARGE TEMPERATURE (LOWER STRESS, LONGER LIFE)

THE "BEST" CHARGE CONTROL APPROACH? FROM THE BATTERY'S POINT-OF-VIEW

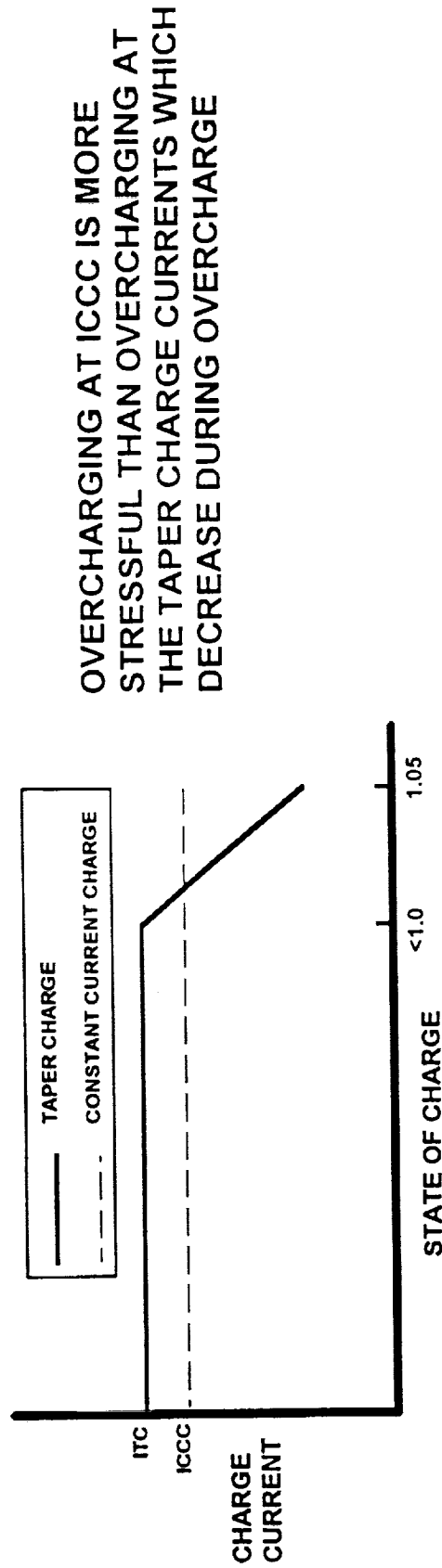
- PERFORMANCE
 - MORE AGGRESSIVE CHARGING CAN RESULT IN HIGHER DISCHARGE VOLTAGE AND CAPACITY (BETTER PERFORMANCE)
 - HOWEVER, AGGRESSIVE CHARGING USUALLY IMPLIES MORE OVERCHARGE AT HIGHER RATES WITH CONCOMITANT HIGHER END OF

THE "BEST" CHARGE CONTROL APPROACH? FROM THE SPACECRAFT/MISSION POINT-OF-VIEW

- CONSTRAINTS
 - PERFORMANCE
 - LIFE
 - ENVIRONMENT
- IMPACT ON OTHER SYSTEMS
 - POWER SUBSYSTEM ARCHITECTURE
 - SOLAR ARRAY

EXAMPLE

IMPACT OF CHARGE CONTROL APPROACH ON SOLAR ARRAY SIZE IN LEO --- CONSTANT CURRENT VS TAPER CHARGE



- HOWEVER, CHARGE CURRENT DRIVES SOLAR ARRAY SIZE
- ITC > ICCC
- SOLAR ARRAY SIZED FOR ITC > SOLAR ARRAY SIZED FOR ICCC
- SOLAR ARRAY COST >> BATTERY COST