

THE BABCOCK & WILCOX COMPANY  
POWER GENERATION GROUP

PRELIMINARY

To G. A. MEYER

From P. J. HENNINGSON

*Paul J. Henningson*

805 662.5

Cust.

File No.  
or Ref.

Subj. INCREASED T.C. READINGS DUE TO PROXIMITY  
OF FUEL PARTICULATES

Date 5:30 P.M.  
APRIL 10, 1979

This letter is cover one customer and one subject only.

REFERENCE: CORE CONDITION TASK FORCE TO J.S. TULENKO, "CURRENT ASSESSMENT  
OF CORE CONDITION, 4/7/79 (1300)," 4/7/79 - 7:48 P.M.

ONE POSSIBLE EXPLANATION OF THE INCREASED T.C. (LOCATED IN UEF'S) READINGS IS THE ACCUMULATION OF  $UO_2$  FRAGMENTS IN AND AROUND THE MIXING CUP. THESE ELEVATED TEMPERATURES, RANGING FROM  $\sim 100^\circ F$  TO  $\sim 190^\circ F$  ABOVE THE COOLANT TEMPERATURE, ARE IN THE CENTRAL PORTION OF THE CORE. ACCORDING TO THE REFERENCE, THIS IS THE POSITION OF THE CORE ASSUMED TO HAVE THE GREATEST DAMAGE.

THIS POSSIBILITY WAS INVESTIGATED ASSUMING  $UO_2$  PARTICULATES WERE WITHIN THE MIXING CUP AND AT RADII OF 1/2 IN, 1 IN, 2 IN, 3 IN, AND 4 IN. AXIAL CONDUCTION AND CONVECTION WERE NEGLECTED (GROSS FAILURE).

THE RESULTS ARE SHOWN IN THE ATTACHED FIGURES. FIGURE 1 SHOWS THE TEMPERATURE DIFFERENCE ( $\Delta T$  ( $F^\circ$ )) EXISTING BETWEEN THE I.D. OF THE MIXING CUP AND THE O.D. OF THE INSTRUMENT STRING ASSUMING ENTRAINED  $UO_2$ . THE TEMPERATURE RISE THROUGH THE  $UO_2$  IS SMALL FOR ALL TIMES. FIGURE 2 SHOWS THE AFFECT OF VARYING AMOUNTS OF FAILED FUEL OUTSIDE THE MIXING CUP. THE TEMPERATURE DIFFERENCE ( $\Delta T$  ( $F^\circ$ )) IS FROM THE SURFACE TO THE T.C. WELL SURFACE. (THE ONE INCH WIDTH OF  $UO_2$  OUTSIDE THE T.C. WELL IS SHOWN ON FIGURE 1 FOR COMPARATIVE PURPOSES.)

7907260560

517157

P

IT IS POSSIBLE FOR THE ELEVATED T.C. READINGS TO BE SOLELY DUE TO LARGE AGGLOMERATES OF FUEL PARTICULATES SURROUNDING THE MIXING CUP. FURTHER CREDENCE TO THIS THEORY ARISES FROM THE CHANGE IN T.C. READINGS WHEN THE A-1 PUMP TRIPPED. THEREFORE, ANY DECISIONS UPON CHANGES IN CORE CONFIGURATION SHOULD NOT BE MADE SOLELY ON THE BASIS OF INCORE THERMOCOUPLE READINGS.

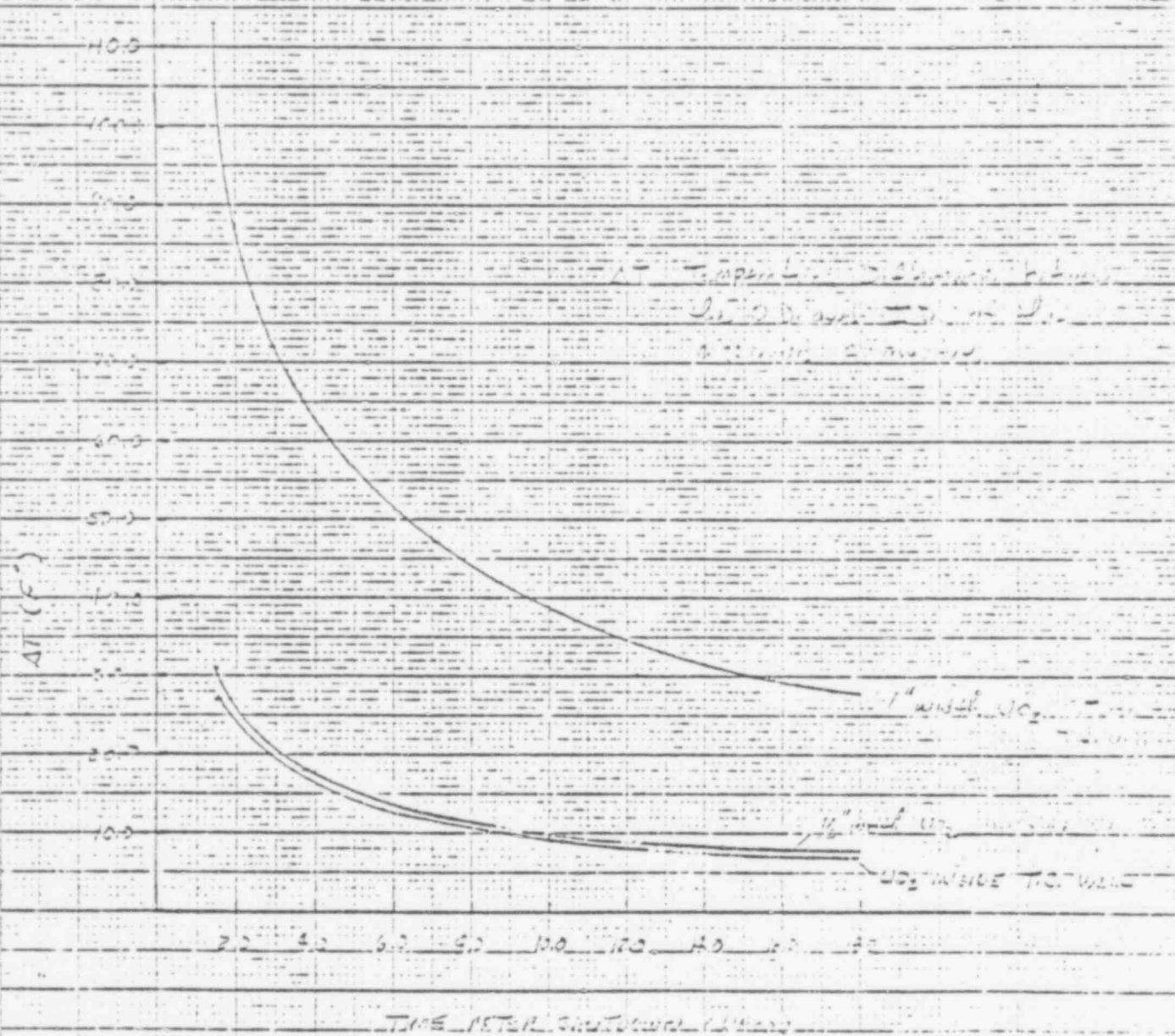
PJH:rw

CC: J. S. TULENKO  
FUEL ENG. UNIT MANAGERS  
CORE HOT SPOT TASK FORCE

549158

40 1470

8 1 11 REUFAL # 155 1/2 1/3 MADE IN U.S.A.



POOR ORIGINAL

549159



POOR ORIGINAL

FIGURE 2