GPU 2707

Sou

~~Eric Hall~~
Doesn't this belong to someone else?
Don Howell

THE BABCOCK & WILCOX COMPANY
POWER GENERATION GROUP

To
DISTRIBUTION

From
L R Cartin
L. R. CARTIN, PLANT INTEGRATION (2835)

BDS 663-3

Cust.

File No.
or Ref.

Subj.
MEETING MINUTES ON HPI OPERATION PROCEDURE

Date
APRIL 18, 1979 8:10 a.m.

This letter to cover one customer and one subject only.

DISTRIBUTION

G. J. BRAZILL
B. M. DUNN
N. ELLIOTT
R. E. HAM
D. L. HOWELL
E. W. SWANSON
R. O. VOSBURGH
R. W. WINKS

A MEETING WAS HELD ON APRIL 16TH TO DISUCSS THE OPERATIONAL LIMITS WHICH SHOULD GOVERN OPERATOR ACTIONS TO SECURE OR TERMINATE HPI. THIS MEETING WAS VIEWED AS THE FIRST STEP TO EXPAND PREVIOUS CONSIDERATION ON THIS SUBJECT TO COVER ALL POTENTIAL OPERATIONAL MODES AND TO ELIMINATE OR MODIFY THE IMPOSED TIME/SUBCOOLING LIMITS.

TABLE 1 PROVIDES A LIST OF ITEMS TO BE CONSIDERED BOTH IN THE LONG AND SHORT TERM. THE IDENTIFIED SCHEDULE, IN GENERAL, REFLECTS A COMBINATION OF PRIORTIES AND PROBLEM COMPLEXITY. ITEMS 1-4 WERE CONSIDERED TO SOME EXTENT IN THIS FIRST MEETING, AND A SUMMARY OF THE DISCUSSIONS AND/OR CONCLUSIONS FOR EACH IS PROVIDED BELOW. ITEMS 6 & 7, WHICH RELATE TO LONG TERM RECOVERY FROM OPERATIONAL MODES WHICH RESULT IN A SOLID PRIMARY SYSTEM AND THERMAL SHOCK EFFECTS ON THE RV AND COLD LEG PIPING DUE TO THE INJECTION OF COLD HPI WATER, WILL BE DISCUSSED AT A LATER DATE.

50F SUBCOOLING LIMIT & INSTRUMENTATION LIMITS

THE ESTABLISHMENT AND MAINTENANCE OF A 50F SUBCOOLING LIMIT PRIOR TO TERMI-

NATION OF HPI WAS ORIGINALLY INTENDED TO COVER BOTH THE REQUIRED THERMAL MARGINS AND ANTICIPATED INSTRUMENT ERROR. IT WAS CONCLUDED THAT THE 50F SUBCOOLING LIMIT SHOULD BE REPLACED WITH P-T CURVES ~~THAN~~ THAT INCORPORATES A 20F SUBCOOLED MARGIN PLUS APPROPRIATE INSTRUMENATION ALLOWANCES WHICH WILL REFLECT ACTUAL EXPECTED DEVIATIONS. CONSIDERATIONS CAN THEN BE GIVEN TO THE ACTUAL INSTRUMENTS AND READOUT CAPABILITIES AVAILABLE (E.G., NARROW RANGE VS WIDE RANGE PRESSURE AND COMPUTER VS INDICATIORS VS STRIP CHART RECORDERS).

20 MIN TIME LIMIT-IMPACT ON OVERCOOLING/DEPRESSURIZATION TRANSIENTS

THE 20 MINUTE TIME LIMIT ~~PROVIDED IN REFERENCE 1~~ WAS ORIGINALLY DEVELOPED TO ENSURE THAT THE OPERATOR DOES NOT BASE HIS DECISION TO TERMINATE HPI FLOW ON SYSTEM CONDITIONS EARLY IN THE TRANSIENT WHICH WOULD NOT INDICATE LONG TERM TRENDS. THIS TIME LIMIT HAS COME UNDER CRITICISM FROM WITHIN B&W AND FROM SEVERAL CUSTOMERS BECAUSE, UNDER CERTAIN CIRCUMSTANCES, THIS "WAIT PERIOD" MAY RESULT IN THE HPI'S PUMPING THE SYSTEM SOLID WITH WATER RELIEF OUT THE CODE SAFETY VALVES. D. HOWELL PRESENTS RESULTS, FROM SOME SCOPING STUDIES UTILIZING THE OFR SIMULATOR FOR NON-LOCA DEPRESSURIZATION EVENTS, WHICH CONFIRMED THAT WATER RELIEF VIA THE SAFETY VALVE WAS A DISTINCT POSSIBILITY IF A 20 MINUTE WAIT PERIOD IS MANDATORY. THESE SIMULATIONS ALSO EXAMINED THE ABILITY OF THE OPERATOR TO CONTROL P&T WHEN THE PRESSURIZER HAS BEEN PUMPED SOLID. SEVERAL ATTEMPTS TO COOLDOWN AND DEPRESSURIZE WERE MADE, AND IT WAS FOUND THAT PRESSURE SWINGS IN A SOLID MODE RESULTED IN VIOLATION OF THE 50F SUBCOOLING LIMIT AND FULL DECOMPRESSION LIMITS.

IT WAS TENTATIVELY CONCLUDED THAT THE 20 MINUTE WAIT PERIOD COULD BE ELIMINATED PROVIDED THAT ACTION TO TERMINATE HPI BE TAKEN ONLY IF A SOLID PRESSURIZER IS

EMINENT (I.E., PRESSURIZER LEVEL/PRESSURE INCREASING). THIS CHANGE WOULD ALLOW THE OPERATOR TO TERMINATE HPI DURING OVERCOOLING EVENTS (NON-LOCA) AND TO PREVENT STEAM OR WATER RELIEF OUT THE PRESSURIZER CODE SAFETY OR RELIEF VALVES. R. O. VOSBURGH INDICATED THAT THIS REVISED POSITION WOULD NOT IMPACT THE ACCIDENT ANALYSIS RESULTS FOR CHAPTER 15 EVENTS. B. M. DUNN WAS ASK, HOWEVER, TO RE-EVALUATE THIS POSITION TO DETERMINE IF CORE COOLING COULD BE COMPROMISED FOR ANY POTENTIAL LOCA'S (I.E., 50F SUBCOOLING ON RTD'S MAY NOT INDICATE A SOLID SYSTEM DURING A LOCA). CONFIRMATION OF THIS POSITION IS THUS INDEPENDENT UPON COMPLETION OF ECCS'S REVIEW.

LRC:rw

ATTACHMENT

TABLE 1: REVIEW ITEMS FOR HPI TERMINATION CRITERIA

1. REASSESS REQUIREMENT FOR 50F SUBCOOLING LIMIT (BY APRIL 20TH).

2. DEFINE INSTRUMENT ERROR IN RELATIONSHIP TO THE 50F SUBCOOLING LIMIT (BY APRIL 20TH).

3. DOCUMENT BASIS FOR OR ELIMINATE 20 MINUTES OPERABILITY TIME PERIOD PRIOR TO HPI TERMINATION (BY APRIL 20TH).

4. EVALUATE IMPACT OF OPERATING INSTRUCTION ON ALL ANTICIPATED EVENTS (BY APRIL 20TH).

5. REFINE PROCEDURE TO INCLUDE SELECTIVE TRIPPING AND/OR THROTTLING OF HPI AND USE OF ALL AVAILABLE INSTRUMENTATION (BY APRIL 20TH).

6. LONG TERM RECOVERY FROM "SOLID SYSTEM" OPERATIONAL MODE (2 WEEKS).

7. HPI-THERMAL SHOCK OF RC PIPING AND REACTOR VESSEL (1 MONTH).