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SUBJECT: Forwards response to addl question from Containment Engineering Branch re SER Outstanding Issue 30.

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Vice President-Engineering & Construction-Nuclear
770-5291

June 16, 1981

Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Docket Nos. 50-387
388

SUSQUEHANNA STEAM ELECTRIC STATION
SER OUTSTANDING ISSUE #30
ER100450 FILE 841-2
PLA-847

Dear Mr. Schwencer:

Attached is a response to an additional question from the Containment Engineering Branch.

Very truly yours,

N.W. Curtis
Vice President-Engineering and Construction-Nuclear

cc: R.M. Stark

B001
S.1

QUESTION:

Explain why a single failure will not disable both the RHR shutdown cooling function and one RHR loop in the suppression pool cooling mode.

RESPONSE:

A single failure can indeed disable the RHR shutdown cooling function and one RHR loop in the suppression pool cooling mode under the following assumptions. Both units are operating at full power when a complete long-term loss of offsite power (LOOP) occurs. This leads to main steam line isolation and reactor scram. Following the LOOP all four (4) diesel generators should start to supply power to the ESS busses, however, it is assumed that the diesel generator 0G501C does not start (single failure). 0G501C supplies power to the ESS busses 1A203 and 2A203*, to the RHR pumps 1C and 2C*, and to the RHR service water pump 1A. Loss of 0G501C means that the inboard shutdown cooling isolation valves on both units, 1F009 and 2F009*, loose power to their operators, thus disabling the RHR shutdown cooling mode. Since these valves are located inside the primary containment it is conservatively assumed that they will not be manually reopened. Only the "B" loop and the corresponding RHRSW loop of the RHR system (in both units) would be readily available for suppression pool cooling, using e.g. RHR pumps 1B and 2D*. The "A" loop of one unit could be made available by manually operating four (4) valves(close F048A, open F024A, HV_1210A and HV_1215A) and using RHRSW pump 2A* and either RHR pump 1A or 2A*. However, a simultaneous operation of RHR pumps 1A and 2A* is prohibited by electrical interlocks. Thus one of the units would have only one RHR loop available in the suppression pool cooling mode without the possibility to switch to shutdown cooling.

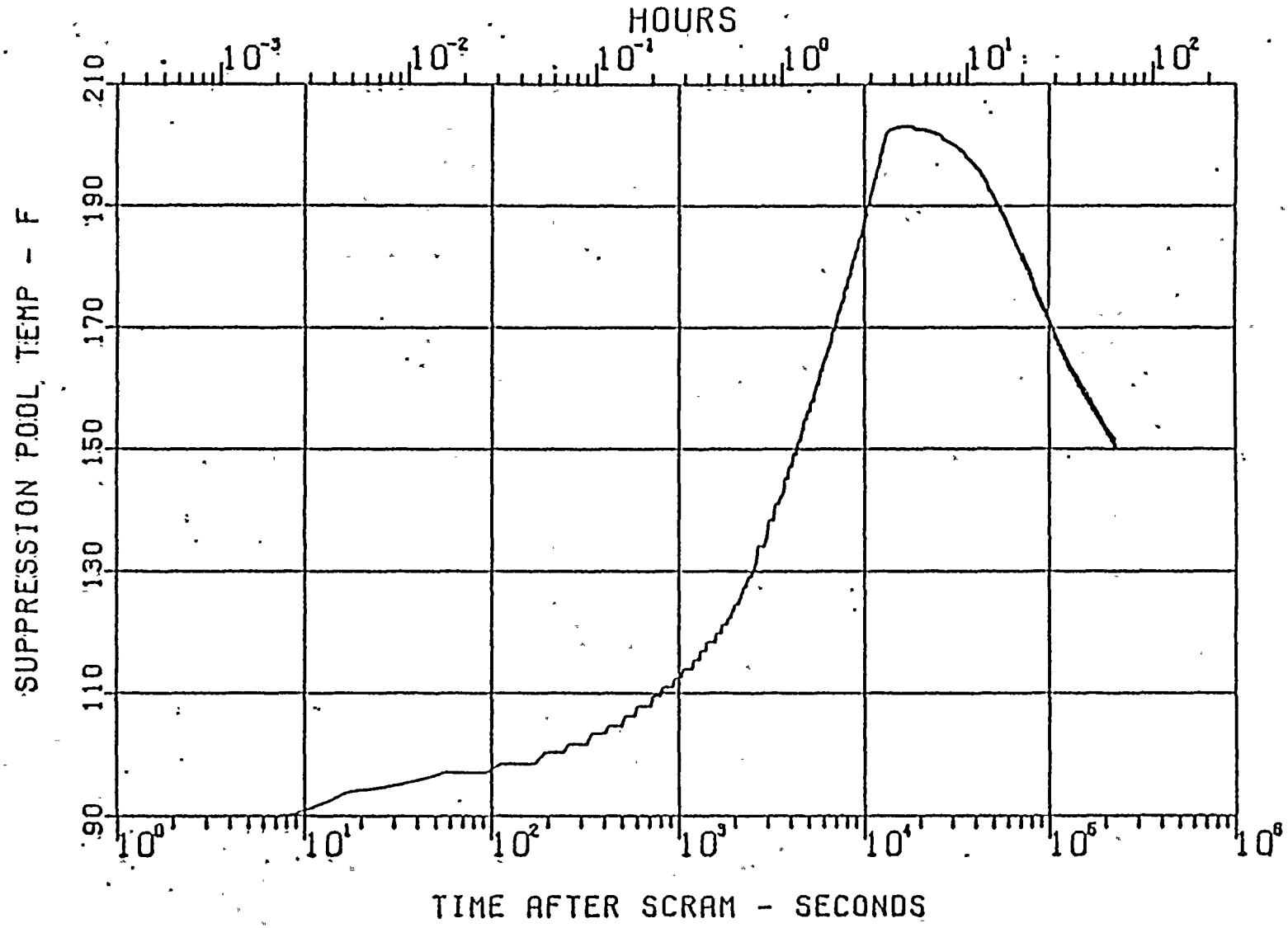
This case has not been considered in the transients submitted as part of Appendix I of the DAR and may be more limiting. However, a similar but more conservative case was analyzed as part of a sensitivity study and resulted in a maximum pool temperature of 203°F. The assumptions for this case are indentical to case 2.a (Appendix I, DAR) except that shutdown cooling is not initiated. The curves for reactor pressure vs. time and suppression pool temperature vs. time are attached.

As mentioned above this case is similar, but more conservative than the case under consideration. The major difference is that reactor water make-up would not be from the feedwater/condensate system but from HPCI (at reactor pressures above approximately 300 psia) and core spray (at reactor pressures below approximately 300 psia), which both take suction from the condensate storage tank and/or the suppression pool. Thus, water much colder than feedwater would be used for make-up.

* An asterisk indicates a Unit 2 component.

This contributes to the reactor depressurisation and leads to less steam being dumped into the suppression pool. The peak suppression pool temperature for this case will therefore be lower than in the attached analysis case.

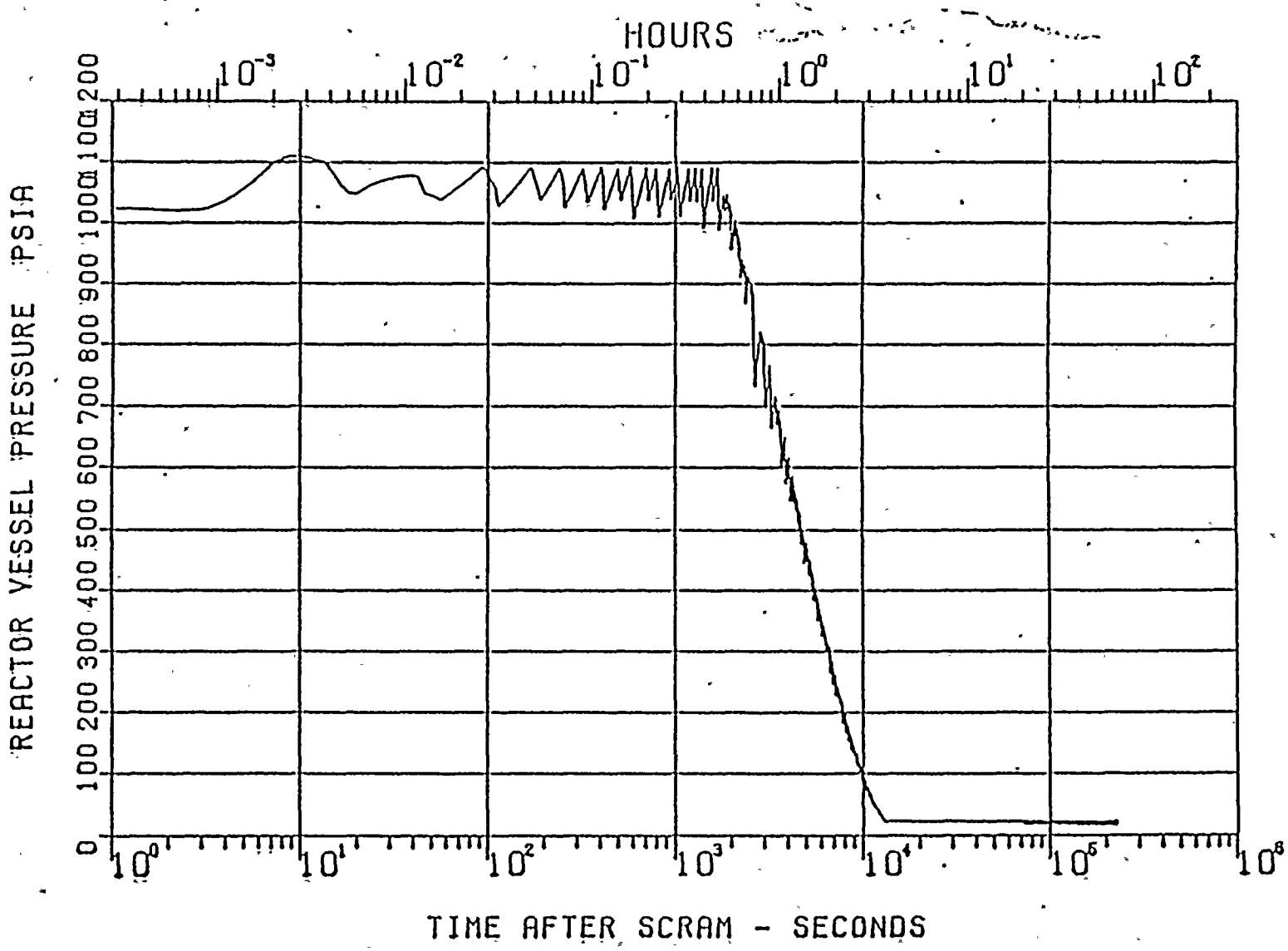
To confirm a temperature of less than 203°F we have initiated an additional analysis case and will include this case in the next revision to Appendix I of the SSES DAR.



SUPPRESSION POOL TEMP. ANALYSIS

SUSQUEHANNA STEAM ELECTRIC STATION

Case 2.a without shutdown cooling



SUPPRESSION POOL TEMP. ANALYSIS

SUSQUEHANNA STEAM ELECTRIC STATION

Case 2.a without shutdown cooling