TASK CLOSE OUT DOCUMENT

Task Scope DETERMINE CONTAINMENT RESPONSE TO LOSS OF ALL CONTAINMENT AND ALL DELAY HEAT REJECTED TO THE CONTAINMENT

To: M. Levenson
S. Levy
E. Zebroski

Task No. 27 Date Complete 4/21/79

Reason felt task is complete:

RESPONSE OF CONTAINMENT ANALYSIS COMPLETED RECOMMENDATION MADE. RECOMMENDATION IS TO NOT INSTALL A HIGH FLOW VENT SYSTEM TO VENT THE CONTAINMENT FROM HIGH PRESSURE.

Members of Committee

J. W. THIESING

J W Thiesing / E Zebroski
Signed
Committee Leader

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TMI-2

SIMULATION OF CONTAINMENT RESPONSE TO LOSS OF ALL CONTAINMENT COOLING WITH ALL DECAY HEAT REJECTED TO CONTAINMENT

INDUSTRIAL ADVISORY GROUP

April 20, 1979

J. W. THIESING

A simulation has been completed of the TMI-2 containment pressure response to loss of all containment cooling with the reactor in a configuration wherein all decay heat is rejected to the containment (either a feed and bleed mode or loss of all core cooling).

The TMI-2 containment was modeled using parameters taken from the FSAR, a 10 Btu/ft ^{2}hr $^\circ$F on the outside of the containment, 60°F outside air, and the Uchida correlation for condensing heat transfer to the liner plate.

Two cases were run. The first, shown in Figure 1, assumed initiation of the transient on May 7, 1979. As can be seen, design pressure is achieved in about 13 days. The second case, shown in Figure 2, assumed initation of the transient on June 1, 1979. In this case, containment pressure reaches a value of only 40 psig after 25 days. A hand calculation extrapolation of this transient results in an asymptotic pressure below the 54 psig design value, wherein decay heat generation equals heat transfer from the outside of the containment by convection.

Previous calculations done in the IAG for TMI-2 show that only one operating air cooler out of five available will maintain the containment at less than 50% of design pressure asymptotically.

Since an emergency containment vent system designed to vent at high flow from high pressure would require at least until June 1, 1979 to install, and the containment can accommodate almost any contingency after that time without such a system, even if all cooling were lost (unlikely given the installed redundancy in this plant—5 coolers/fans, 4 cooling water

trains, and limitless deisels), the author recommends that no action be instituted to install such a system. The installation would interfere with work efforts of greater importance and bleed off needed manpower and resources for little or no benefit.

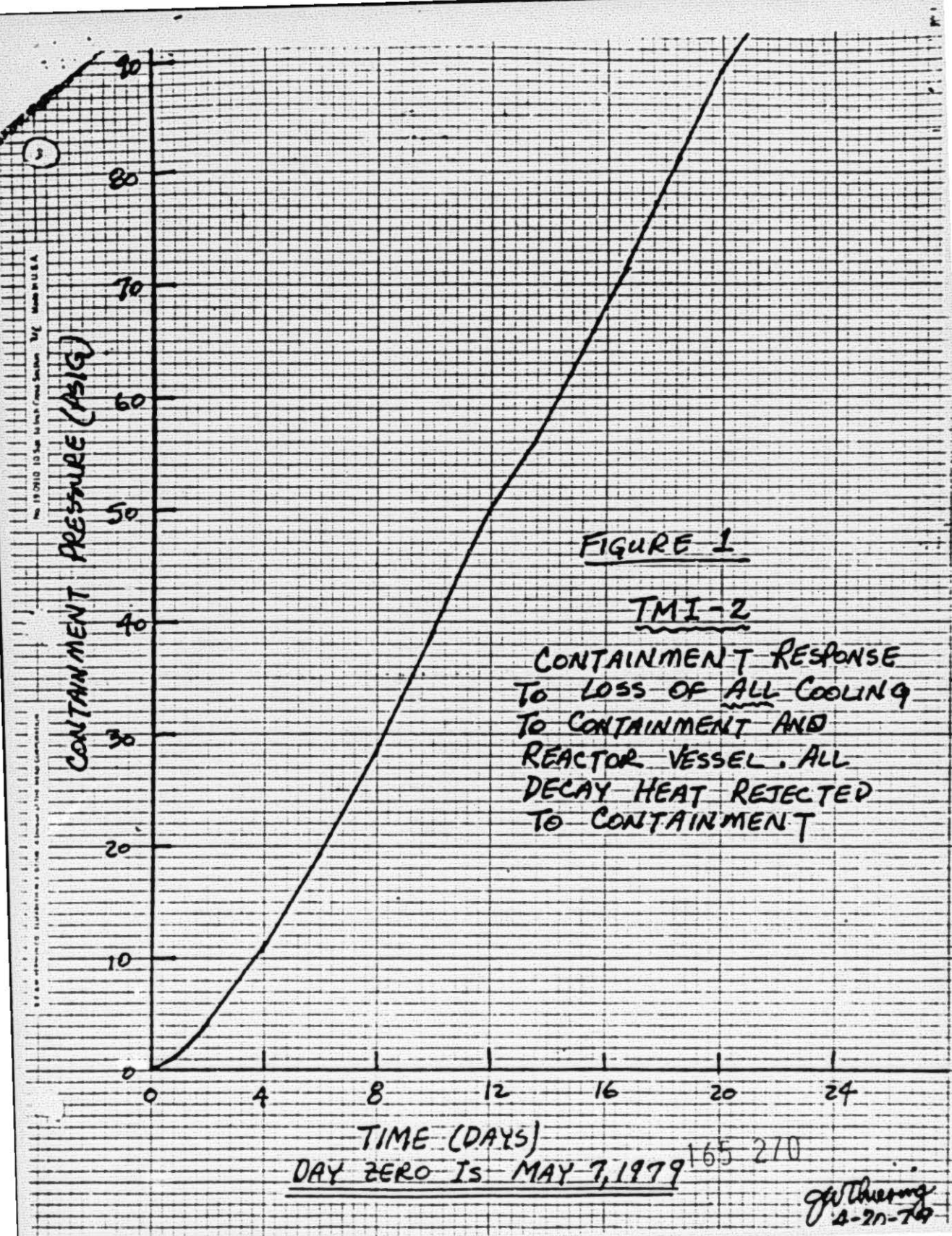

FIGURE 1

TMI-2

CONTAINMENT RESPONSE TO LOSS OF ALL COOLING TO CONTAINMENT AND REACTOR VESSEL. ALL DECAY HEAT REJECTED TO CONTAINMENT

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J.W. Thurman 4-20-79

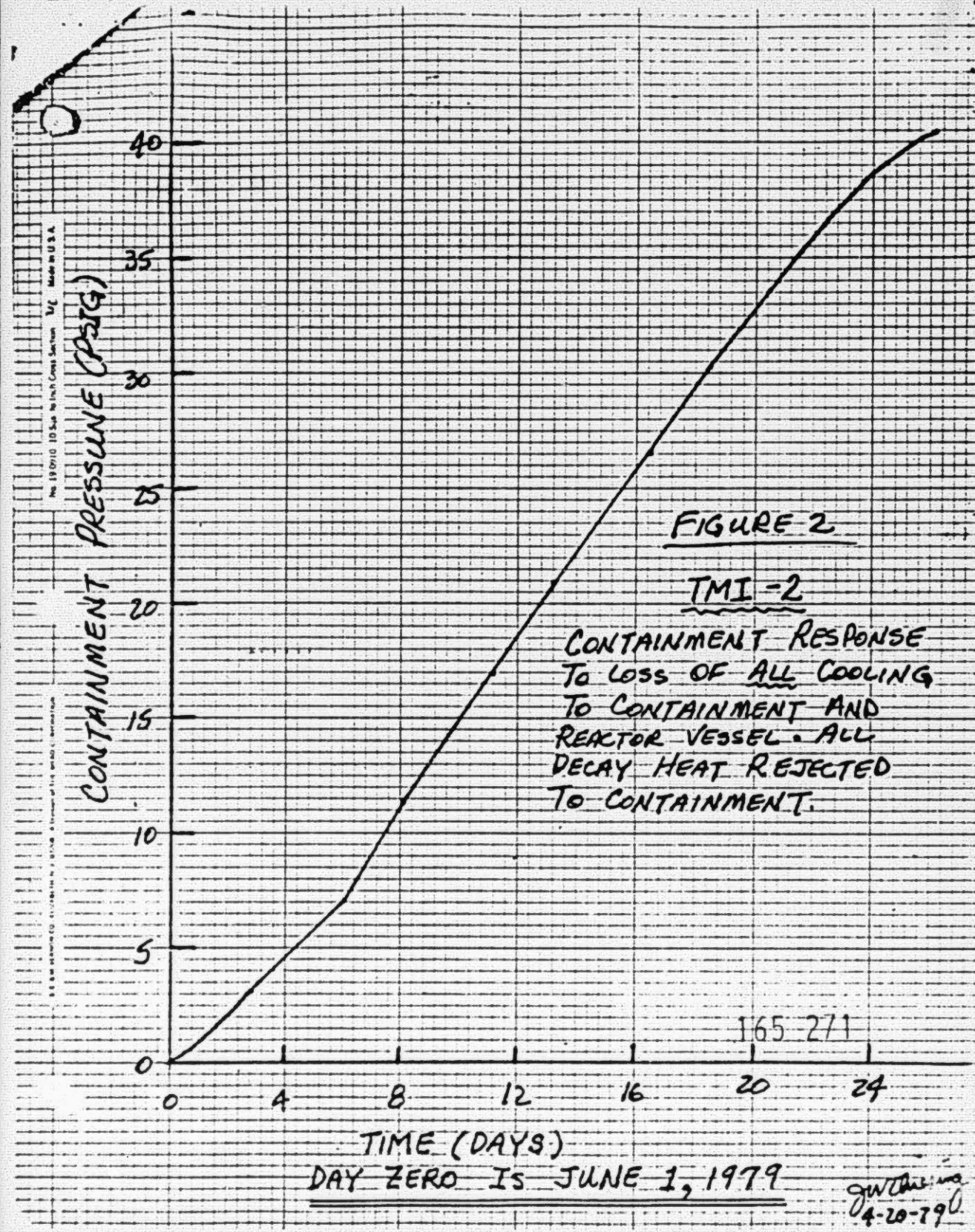

FIGURE 2

TMI-2

CONTAINMENT RESPONSE TO LOSS OF ALL COOLING TO CONTAINMENT AND REACTOR VESSEL. ALL DECAY HEAT REJECTED TO CONTAINMENT.

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