

Figure 1 – using h = 10000: actual P(t) transgresses the maximum allowable pressure curve derived per ASME code for 60 and 200 EFPY, but appears to **nearly** comply with the maximum allowable pressure curve derive by the ASME method at 32 EFPY.

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Instructions for method used by Terry Dickson to generate maximum allowable pressure time histories for Bensen transient number 1

Objective: Solve for maximum allowable pressure as a function of time as follows (see attached paper for more details).

 $P(t) = \{33.2 + 20.734 \exp [0.02 (T(t) - RT_{NDT} - \beta)] - K_{IT}(t) \} x (t / R_i) x (1 / \alpha) x (1 / M_m)$

Where:

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RTNDT (t/4) = RTNDT at tip of (t/4) flaw where for Palisades, the following values were used:

RTNDT(t/4) @ 32 EFPY = 250.4 F

RTNDT(t/4) @ 60 EFPY = 281.2 F

RTNDT(t/4) @ 200 EFPY = 338.5 F

T(t) = temperature time history at crack tip of t/4 flaw and is determined by FAVOR when coolant time history of Bensen transient 1 is input into FAVLOAD input dataset.

$K_{IT}(t) = K_{IT}(t)$ due to thru-wall thermal gradient

This is the KI time history at the crack tip for aspect ratio = 6 when the Bensen coolant temperature time history for transient 1 is input into FAVLOAD input dataset.

The FAVLOAD input dataset **Lb1cool.** in is attached. Note that the stress free temperature is set to be equal to the coolant temperature at time = 0 (530 F). Set pressure = 0 and turn off thru-wall weld residual stress. This insures that the load at t = 0 is zero.

The attached dataset **pax1.in** is the input file for FAVPFM. Note the IQA=1 on record LDQA. This activates the FAVOR deterministic option which allows the user to interrogate the load output file to generate time histories (IOPT-1), etc. IKIND = 1 and XVAR=2.1875 instructs FAVPFM to generate time histories for internal surface breaking flaw of depth 2.1875 which is t/4 flaw for Palisades (8.75/4).



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