UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D. C. 20545

SEP 17 1973

Docket No(s). 50-416/417

Walter R. Butler, Chief, Boiling Water Reactors Branch 1, L

FORTHCOMING MEETING WITH Mississippi Power and Light Company

TIME: 10:00 A. M.

DATE: September 18, 1973

LOCATION: Bethesda, Room P-422

PURPOSE: To discuss Applicant's planned response to questions raised by Staff in regard to the Containment for Grand Gulf.

PARTICIPANTS:

| | | |
|---|---|---|
| AEC: | R. Cudlin | MP & L: J. McGaughy |
| | G. Lainas | Bechtel: J. Tkacik, et al |
| | R. Tedesco | Gen. Elec: R. Barr, et al |
| | G. Owsley | |
| | W. Butler | |

G. Owsley
Project Manager
Boiling Water Reactors Branch 1
Directorate of Licensing

DISTRIBUTION:
Docket File(s)
AEC PDR
Local PDR
BWR-1 File
L Reading
RP Reading
EGCase
AGiambusso
RSBoyd
VAMoore
WPHaass
JHendrie
RFFraley, ACRS
JStolz
Regulatory Operations (3)

**Licensing Assistant**
**Receptionist**
**Proposed Principal Attendees**



B/41

GENERAL ELECTRIC CO.
Nuclear Energy Division
ENGINEERING CALCULATION SHEET

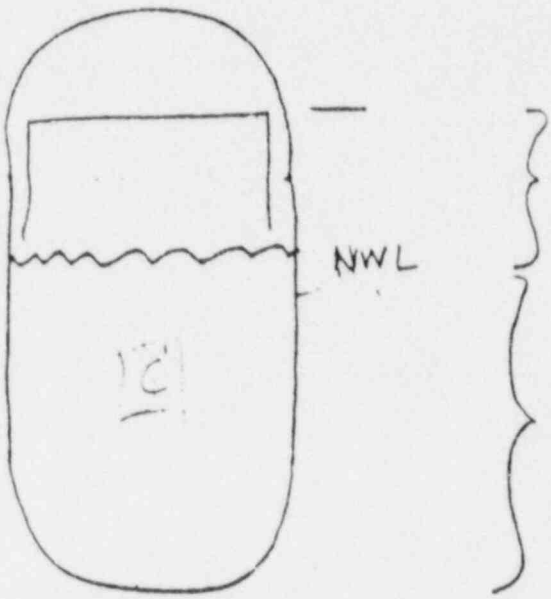
DATE 9-21-73

SHOP ORDER NO. BOUNDING LEVEL SWELL CALCULATION

SUBJECT _____ BY A.J.J SHEET 1 OF _____

## VESSEL / STEAM LINE GEOMETRY

761E448B Rev.




FREE VOLUME ≃ 4400 FT³

FREE VOLUME ≃ 14000 FT³

TO RAISE THE LEVEL TO THE TOP OF THE DRYERS, 4400 FT³ OF VOIDS MUST BE CREATED BELOW THE WATER LEVEL

ASSUMING 1000 PSIA, 14000 FT³ OF LIQUID ≡ $.648 \times 10^6$ LB.

WHAT IS PRESSURE SUCH THAT $.648 \times 10^6$ LB WILL OCCUPY 18,400 FT³ IE. HAVE A SPECIFIC VOLUME OF .02839 FT³/LB AND AN $h$ OF $h_f$ AT 1000 PSIA.

$$.02839 = v_{f_p} + x\, v_{fg_p}$$

$$542.6 = h_{f_p} + x\, h_{fg_p}$$

$$x = \frac{(542.6 - h_{f_p})}{h_{fg_p}}$$

FORM NO. NED-87

B142

$$\therefore \cdot 02839 = v_{fP} + \frac{v_{fgP}}{h_{fgP}}\left(542.6 - h_{fP}\right)$$

| guess P | RHS OF EQUN. |
|---|---|
| 980 | .02358 |
| 960 | .02571 |
| 940 | .02785 |
| 930 | .02900 |

$\therefore$ P = 935 psia ⇐

I.E. A $\Delta P$ OF 65 PSI

CALCULATE $\dot{P}$ IN VESSEL AND FIND $\Delta t$ TO GIVE $\Delta P = 65$

FROM SCLER8

$$\frac{dP}{dt} = \left( \frac{\dot{Q} + w_i h_i - w_o h_o - f(P)(w_i - w_o)}{M \times F(P, V/m)} \right)$$

$\dot{Q} = 0$ (Hot standby case, highest $\dot{P}$ $\therefore$ CONSERVATIVE & ALSO consistent with assumption of constant enthalpy in vessel)

$w_i = 0$ (No f.w. flow at $\dot{Q} = 0$)

GENERAL ELECTRIC CO.
Nuclear Energy Division
ENGINEERING CALCULATION SHEET

DATE 1-21-73

SHOP ORDER NO. BOUNDING LEVEL SWELL CALCS

SUBJECT _____ BY A.J.J. SHEET 3 OF _____

$W_0$ = BREAK FLOW = 9500 $\frac{LB}{SE}$

$h_0 = h_{g_{1000}} =$ 1193 $\frac{BTU}{lb}$

$J(P) =$ 520 BTU/lb

$M = \frac{14{,}000}{.02159} + \frac{8200}{.4243}$ ← TOTAL STEAM VOLUME

$M = .668 \times 10^6$ lb

$\frac{M}{V} = 30.1 \quad \frac{V}{M} = .0332$

$-F\left(P, \frac{V}{M}\right) = .16 \frac{BTU}{psi\ lb.}$

$$\therefore \dot{P} = \frac{-9500 * 1193 - 520(0-9500)}{.668 10^6 * .16}$$

$\frac{lb}{sec}\ \frac{BTU}{lb}\ \frac{psi\ lb}{lb\ BTU}$ $\frac{PSI}{SEC}$

$\dot{P} = 60$ psi/sec.

$\therefore$ SWELL TIME = 1.0 SECS.

(NOTE: THIS IS FOR HOT STANDBY CONDITION.) & IS ONLY A BOUNDING CALC.

FORM NO. NED-87