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50-335

FPL

FLORIDA POWER & LIGHT COMPANY

September 18, 1979
L-79-258

U.S. NUCLEAR REGULATORY COMMISSION
'79 SEP 20 A9:15
REGION II
ATLANTA, GA.

Mr. James P. O'Reilly, Director, Region II
Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

Re: RII:JPO
50-335
IE Bulletin 79-21

Florida Power & Light Company has reviewed the subject Bulletin and a response is attached.

Very truly yours,

Robert E. Uhrig

Robert E. Uhrig
Vice President
Advanced Systems & Technology

REU/DKJ/ms

Attachment

cc: Director, Office of Inspection and Enforcement
Harold Reis, Esquire

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ATTACHMENT
RESPONSE TO IEB 79-21

Response 1.

A review of liquid level measuring systems located within the St. Lucie Unit 1 containment has concluded that only two such systems either initiate safety actions or provide post-accident monitoring information. These systems measure the levels contained in the pressurizer and the steam generators. Both systems use level transmitters of a differential pressure type utilizing open column reference legs with condensing pots.

The pressurizer has two level transmitters which are used for control and indication purposes only. Each steam generator has six level transmittters. Two are used for control and indication purposes and the remaining four initiate safety action (Low steam generator water level trip signal) as well as providing level indication.

Response 2

Post-accident ambient temperatures differing from the design operating value will induce errors in the water levels indicated in the control room. Increased reference leg temperatures will cause a decreased reference column density which will in turn cause a higher indicated level than is actually present in the associated vessel (steam generator or pressurizer). A tabular presentation of this temperature effect is provided in Tables 1 & 2 (attached). The maximum containment temperature calculated for the most severe accident (LOCA) is 259°F.

Level errors can also be induced by pressure changes within the pressurizer or steam generators due to the effect on the size of steam bubbles entrained in the saturated fluid contained in these vessels. Evaluation of the dynamic effects of rapid pressurization or depressurization requires complex calculations for each individual case. Static effects have been determined for various pressures and are provided as Figures 1 and 2.

Flashing of reference leg fluid is a third potential source of error in level indication. Flashing could cause rapid fluctuations of large magnitude in the reference leg fluid level resulting in large errors in indicated level. For both the pressurizer and the steam generators, a rapid and very large depressurization would be required in order for flashing to occur in the reference legs. Assuming a reference leg temperature of 260°F (maximum postulated containment temperature is 259°F), flashing would not be expected to occur until pressure reached approximately 35 psia. A reactor trip would be initiated long before this pressure is reached either by the Thermal Margin/Low Pressure trip function (1735 psig minimum pressurizer pressure) or the Low Steam Generator Pressure trip function (485 psig minimum steam generator pressure).

Response 3

A review of the St. Lucie Unit 1 safety analyses indicates that the low steam generator level trip is required to initiate a safety action only for the excess load transient and the loss of normal feedwater flow cases. As neither of these cases involve a high energy break within containment, they would have no effect on indicated level. As stated previously, pressurizer level is not utilized to initiate any safety action. It is concluded that no setpoint changes are required.

Response 4

Emergency procedures are undergoing review and revision to incorporate the information provided in Responses 1, 2, and 3. All licensed operators will be instructed on the potential for level errors as described by the bulletin. All figures and tables provided as the response to this bulletin will be readily available to the operators in the control room. Procedure changes will be completed by October 31, 1979, and operator training will be completed by November 30, 1979.

TABLE 1

CORRECTIONS TO INDICATED STEAM GENERATOR LEVEL
DUE TO REFERENCE LEG HEAT-UP

Containment Temperature °F	Induced Error % of Span
100	0
200	+ 4.6
250	+ 7.8
280	+ 9.9
300	+11.4

BASIS: Level calibration temperature = 100°F
Level calibration pressure $\leq$ 900 psia
Reference leg effective height $\leq$ 1.1 x level span

TABLE 2

CORRECTIONS TO INDICATED PRESSURIZER LEVEL
DUE TO REFERENCE LEG HEAT-UP

Containment Temperature °F	Induced Error % of Span
100	0
200	+ 6.8
250	+11.4
280	+14.6
300	+16.8

BASIS: Level calibration temperature = 100°F
Level calibration pressure $\leq$ 2250 psia
Reference leg effective $\leq$ 1.1 x level span

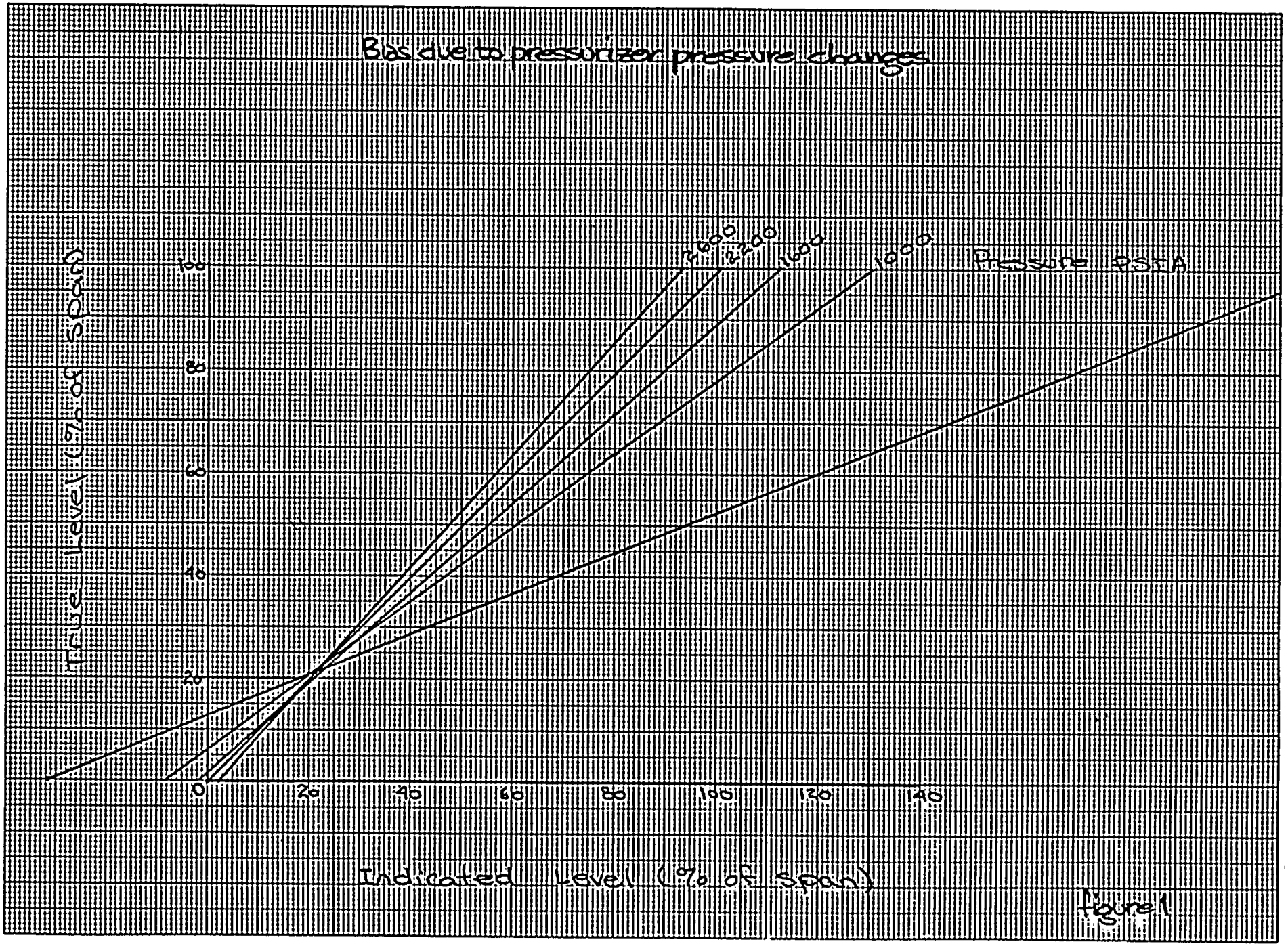
Bias due to pressurizer pressure changes
Pressure PSIA
2600
2200
1800
1000
100
True level (% of span)
100
80
60
40
20
0
20
40
60
80
100
120
140
Indicated level (% of span)

Figure 1

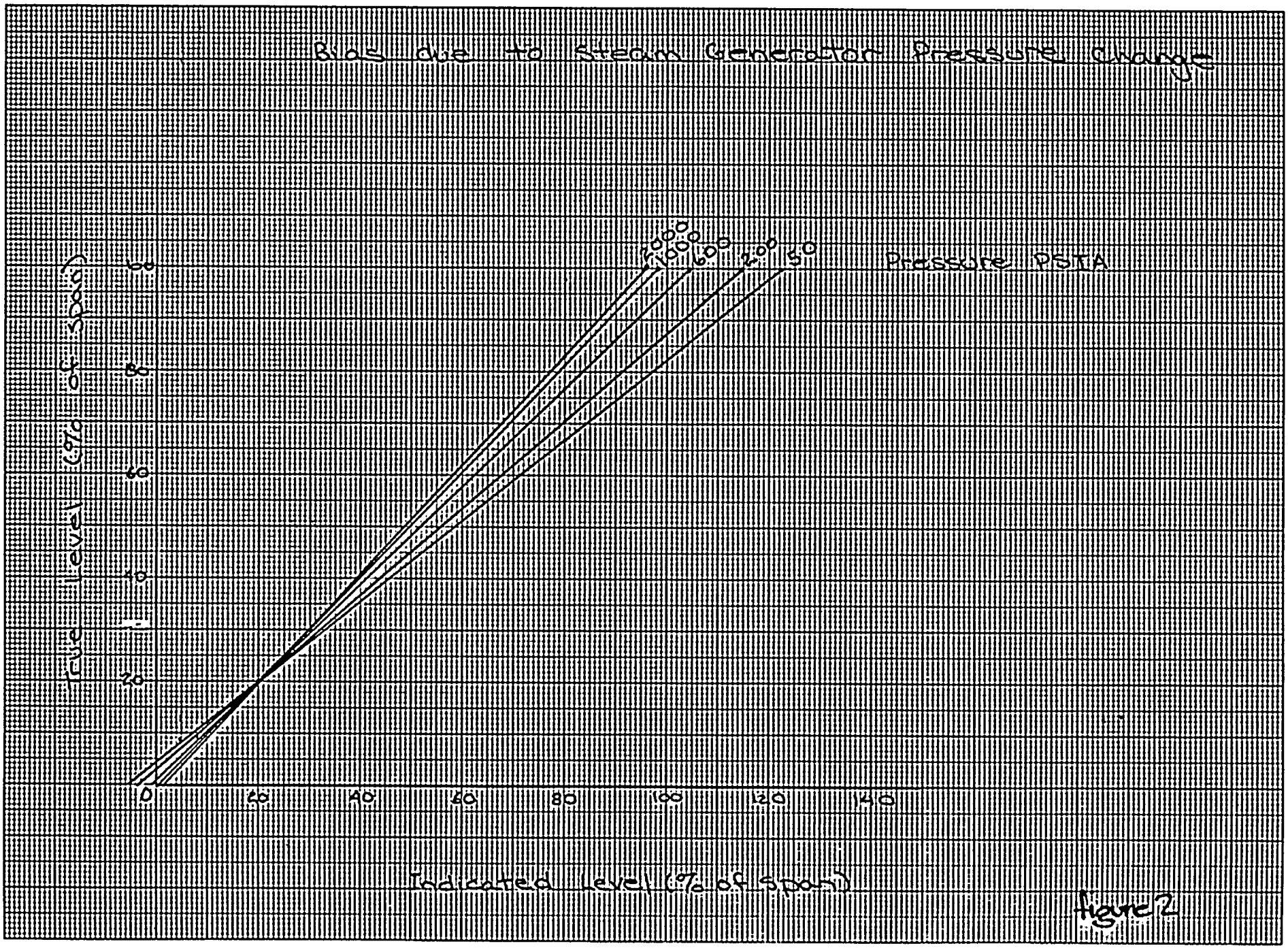

figure 2