A 07/26/78

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)
DISTRIBUTION FOR INCOMING MATERIAL 50-335

REC: REID R W
NRC

ORG: UHRIG R E
FL PWR & LIGHT

DOCDATE: 07/18/78
DATE RCVD: 07/24/78

DOCTYPE: LETTER NOTARIZED: NO
SUBJECT:
RESPONSE TO NRC LTR DTD 05/17/78...FORWARDING INFO RE CHEMICAL VOLUME CONTROL SYSTEM VIBRATORY LOADS ASSOCIATED WITH THE OPERATION OF POSITIVE DISPLACEMENT CHARGING PUMPS.

COPIES RECEIVED
LTR 3 ENCL 3

PLANT NAME: ST LUCIE #1

REVIEWER INITIAL: XJM
DISTRIBUTOR INITIAL: ML

********** DISTRIBUTION OF THIS MATERIAL IS AS FOLLOWS **********

GENERAL DISTRIBUTION FOR AFTER ISSUANCE OF OPERATING LICENSE.
(DISTRIBUTION CODE A001)

FOR ACTION: BR CHIEF ORB#4 BC**W/7 ENCL

INTERNAL:
REG FILE**W/ENCL
I & E**W/2 ENCL
HANAUER**W/ENCL
AD FOR SYS & PROJ**W/ENCL
REACTOR SAFETY BR**W/ENCL
EEB**W/ENCL
J. MCGOUGH**W/ENCL
NRC PDR**W/ENCL
OELD**LTR ONLY
CORE PERFORMANCE BR**W/ENCL
ENGINEERING BR**W/ENCL
PLANT SYSTEMS BR**W/ENCL
EFFLUENT TREAT SYS**W/ENCL

EXTERNAL:
LPDR'S
FT PIERCE, FL**W/ENCL
TERA**W/ENCL
NSIC**W/ENCL
ACRS CAT B**W/16 ENCL

DISTRIBUTION: LTR 40 ENCL 39
SIZE: 1P+2P

CONTROL NBR: 782060021

BR 4

********** THE END **********

FLORIDA POWER & LIGHT COMPANY

July 18, 1978
L-78-239

RECEIVED DISTRIBUTION SERVICES UNIT
1978 JUL 24 AM 11 40
DISTRIBUTION SERVICES US NRC

Office of Nuclear Reactor Regulation
Attention: Mr. R. W. Reid, Chief
Operating Reactors Branch #4
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Reid:

Re: St. Lucie Unit 1
Docket No. 50-335
CVCS Pipe Vibration

Your letter of May 17, 1978 requested information regarding Chemical Volume Control System (CVCS) vibratory loads associated with the operation of positive displacement charging pumps. We have reviewed the letter and a response is attached.

Very truly yours,

Robert E. Uhrig
Vice President

REU/MAS/cpc

Attachment

cc: Mr. James P. O'Reilly, Region II
Harold F. Reis, Esquire

A001
S 3/3

discharge of each pump and at the common discharge header. Vibration was limited to the range of 0-10 mils peak to peak (± 5 mils) at measured points on the discharging piping including branch connections. Strain readings taken on a branch connection immediately downstream of the "A" pump and its associated accumulator were less than 10 microinches per inch. Thus the recorded field data indicates that vibration and peak alternating stress on the discharge piping is minimal and well below endurance limits.

Suction: Field recorded data on the suction piping (no devices installed) indicated minimal vibration; a maximum of 10 mils peak to peak (± 5 mils) at all points tested. Pressure pulsations were typically around 20 psi peak to peak (± 10 psi). Simulation of the suction piping on the analog computer, with the Greer device described above, resulted in pressure pulsations of 1.0 to 1.5 psi peak to peak. Thus the decision was made to install suction devices as a pump preventive maintenance measure. Recorded field data on the suction piping, with no suction devices installed, indicates vibration is minimal with the peak alternating stress well below endurance limits. Nevertheless, suction devices will be installed, thereby reducing pressure pulsations to about 10% of that recorded in the field and reducing vibration and peak alternating stress to virtually nil.

Questions 2 through 6

These questions were to be answered only if pulsation dampeners are not used. Therefore, based on the response to question 1, responses to questions 2 through 6 have not been prepared.

ATTACHMENT

Re: St. Lucie Unit 1
Docket No. 50-335
CVCS Pipe Vibration

Question 1

Furnish the following information if pulsation dampeners or other mechanical devices are used at the positive displacement pump to reduce vibratory loads transmitted to the pipe systems.

a. Describe the mechanical device employed, i.e., manufacturer, type, size, location (suction or discharge sides of the pump or both), etc.

b. Furnish the percentage of the total vibratory load that is absorbed by the mechanical device.

c. Furnish the peak alternating stress of the affected pipe system. Is this peak alternating stress below the endurance limits?

Response to Question 1.a

Greer "Pulse-Tone" accumulators, model number 30A 2 1/2 FTNS, are installed on the discharge of each of the three charging pumps. These devices are of 2 1/2 gallon capacity and have N_2 filled BUNA N bladders for pressure pulsation dampening. They attach directly to the discharge flange of each pump.

Plans are currently being made to install pulsation dampening devices on the suction of each of the existing charging pumps. Preliminary plans and schedules provide for installation of a device such as Greer "Suction Stabilizers", Model No. SPC-10 during the 1980 refueling outage. These devices are 10 gallon capacity and have N_2 filled rubber bladders for pressure pulsation dampening. The dampening devices will probably be installed directly to the suction flange of each pump.

Response to Questions 1.b and 1.c

A field evaluation study was performed on the St. Lucie Unit 1 charging system in September of 1977. Vibration, strain and pressure pulsation data was recorded, with the RCS at operating conditions, on both the suction and discharge sides of each pump. In addition, an analog computer simulation of the entire CVCS system was performed in January 1978 to evaluate system performance with suction devices installed on the charging pumps.

Discharge: Field recorded vibration, strain, and pressure pulsation data indicates excellent performance of the Greer discharge accumulators. Pressure pulsations were less than 20 psi peak to peak ($\pm$0.5% of line pressure) at the