Post-examination Comments

V. C. SUMMER EXAM
50-395/2004-301

APRIL 19 - 23,2004
April 28, 2004 (written)

Licensee Submitted Post-Examination Comments

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May **5, 2504**

Mr. L. A. Reyes
Regional Administrator, Region II
U. S. Nuclear Regulatory Commission
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, **GA 30303-8931**

Dear Mr. Reyes:

Subject: VIRGIL C. SUMMER NUCLEAR STATION
DOCKET **NO. 50/395**
OPERATING LICENSE NO. **NPF-12**
POST EXAM COMMENTS FOR THE RO EXAM
ADMINISTERED APRIL **28, 2004**

Please find attached SCE&G's post exam comments for the RO exam administered at V. C. Summer Nuclear Station **on** April **28, 2004**. Comments are being submitted for questions **11, 15,** and **38** of the written examination. SCE&G appreciates the opportunity to provide these comments and the NRC's consideration of the information.

If you would like to discuss this information in more detail, please contact Mr. Rusty Quick of my staff at **803-931-5091.**

Very truly yours,

Stephen A. Byrne

CJM/SAB/cm
Attachments

c: M. E. Ernstes
R. S. Baldwin
A. R. Koon
NRC Resident Inspector
WTS **(b-99-0251)**
File **(814.64)**
DMS (RC-04-0083)

Question # 11:

11. 011A3.03 1

-The Unit is at **100%** power
-Pressurizer level channel selector switch is in the 460/461 position
-The sensing line to pressurizer transmitter 460 develops a reference leg leak near the connection point to the D/P cell.

Which one of the following correctly describes the expected plant response? (assume no operator action)

A. **LT-460** indication will fall, charging flow will rise, **actual** pressurizer level will rise, LCV **460** will isolate letdown.

B. LT-460 indication will rise, charging flow will fall, actual pressurizer level will fall, pressurizer deviation *alarm* will come in.

C. LT-460 indication will fall, charging flow will rise, actual pressurizer level will fall, LCV **461** will isolate letdown.

D. LT-460 indication will rise, charging flow will rise, actual pressurizer level will **fall,** pressurizer heaters will **energize.**

Modified bank questions Summer question 1161, and Farley bank question.

A. Incorrect, LT-460 indication will rise, chg flow will fall, **actual pressurizer** level will fall, and 460 will not isolate letdown.

B. Correct.

C. Incorrect, **LT-460** indication will rise, chg flow will fall, actual pressurizer level will fall, but **461** could isolate letdown.

D. Incorrect, LT 460 indication will rise, chg flow will lower, actual pressurizer level will lower, the pressurizer heaters will not energize.

Answer: B

Proposed **Action:**

Change the correct answer from B to D

Justification:

The given conditions provide the examinee with a reference leg break somewhere downstream of the condensing pot for LT 460. The examinees with the correct understanding of how a D/P detector works, based on fundamentals, determine that level would rise. Only answers B and D provide that option.

Considering charging flow control valve FCV 122 and how it will respond, charging flow control will send a decreasing signal in response to the actual PZR level rise (LT 461), or an increasing signal in response to an actual PZR level fall. If the leak is large enough, then actual indicated charging flow will increase in response to the system pressure drop as well, as the affect of decreasing system pressure is a lower backpressure for the charging pump to pump against. It is difficult to predict what would happen to charging flow based on this type theoretical approach, yet in no case will charging flow act in the same direction as PZR level change as described in answer B.

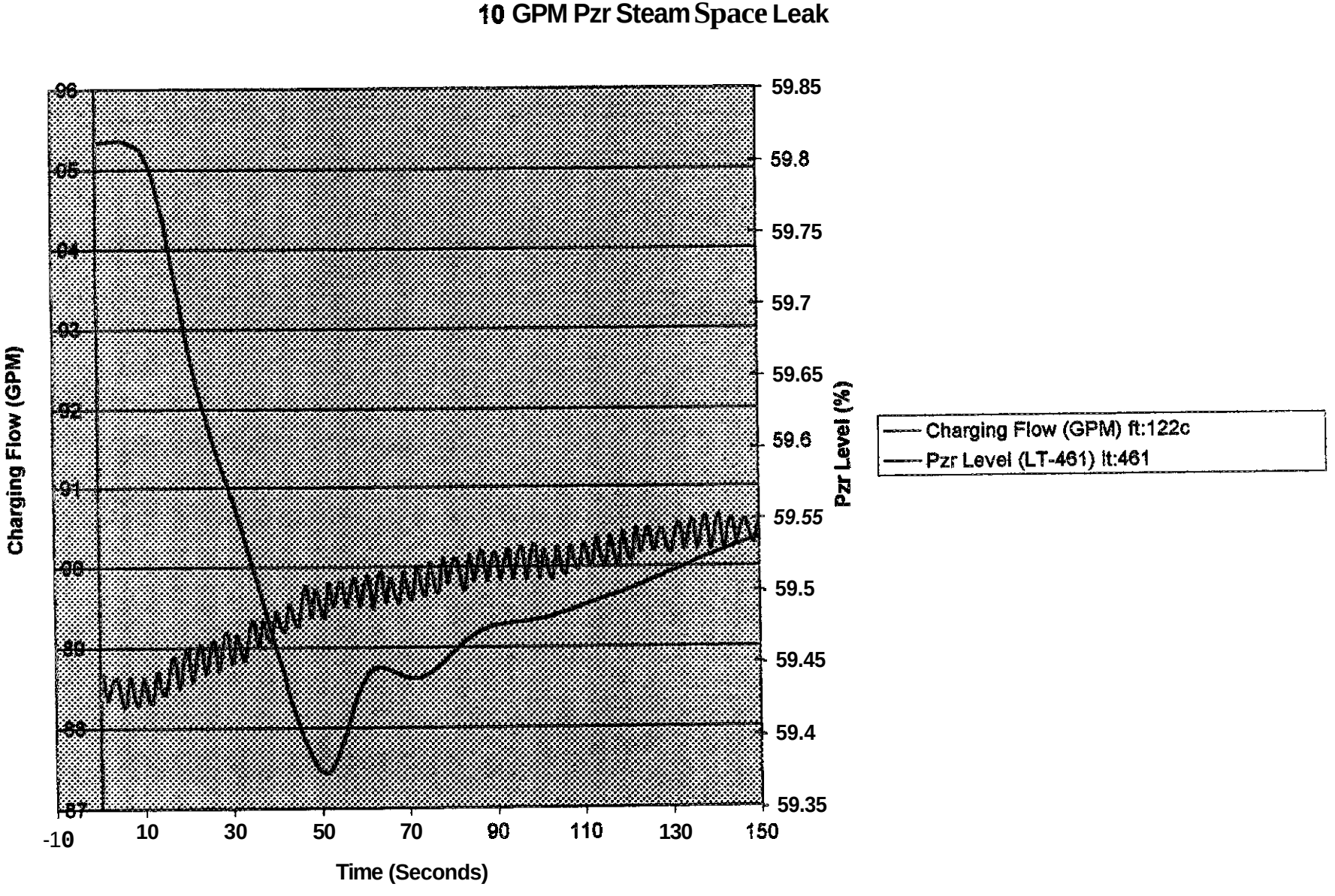
As no specific size was specified in the question, we tried two scenarios on the simulator in an attempt to estimate what we thought might be seen with a reference leg leak on a level detector downstream of the condensing pot.

For a very small steam space leak (we used 10 GPM), actual PZR level fell, as well as charging flow increasing in response to the leak. It was clear that there was not enough mass or pressure lost to cause any appreciable change in reference leg pressure on the controlling channel (in this case, LT 461), and therefore indicated PZR level goes down solely in response to the mass loss. Charging flow will increase in response to the PZR level decrease, and will continue to rise until charging flow matches and then exceeds break flow, and PZR level returns to program This would support answer D.

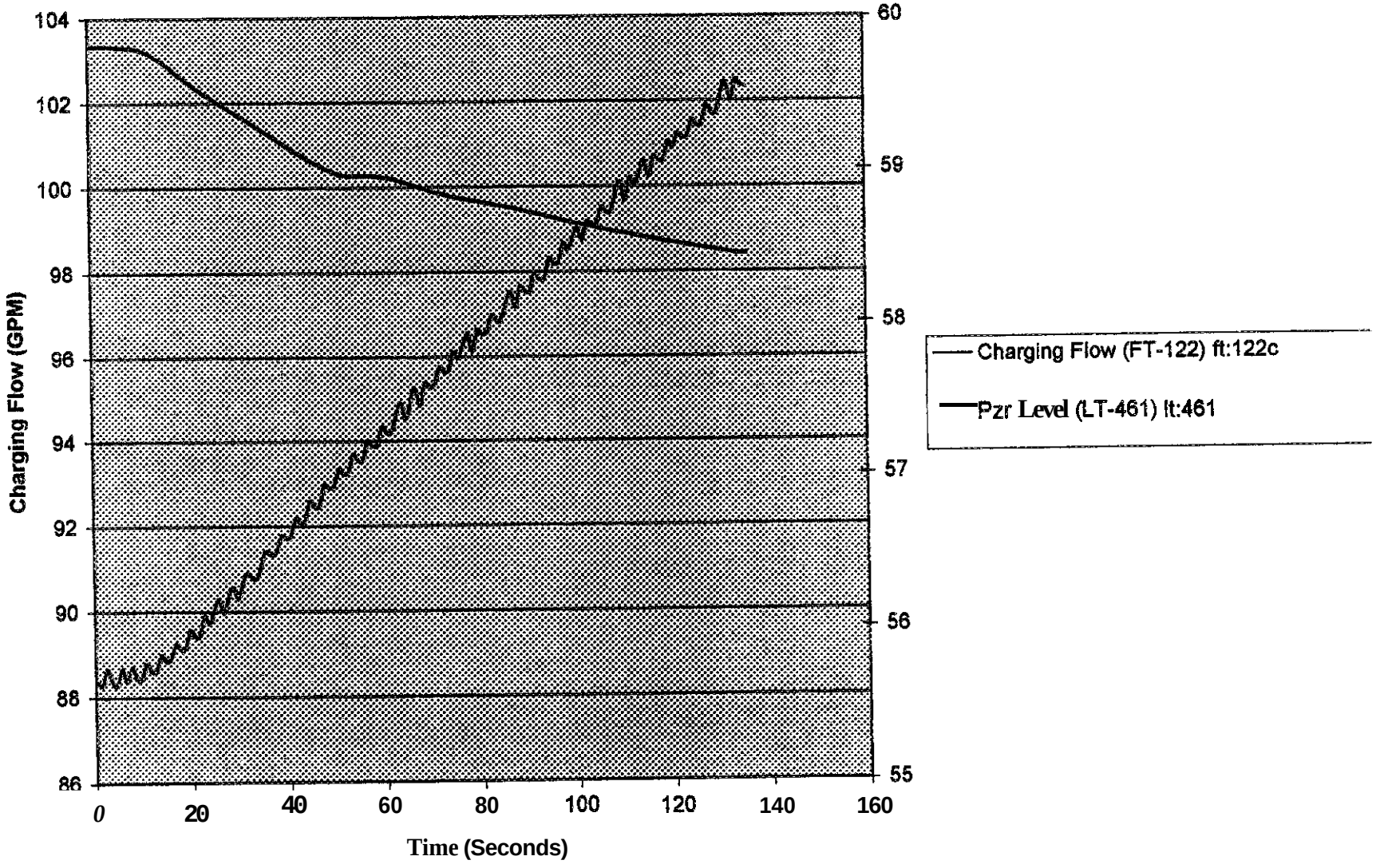
We also ran the steam space leak at 75 GPM. Likewise, the leak was not large enough to cause a flash or large decrease in reference leg pressure for the controlling channel D/P level detector, so the indicated PZR level fell continuously, and charging flow rose continuously, until the RCS pressure decreased to the SI set point and a Rx. Trip/ SI occurred. This size leak also supports answer D

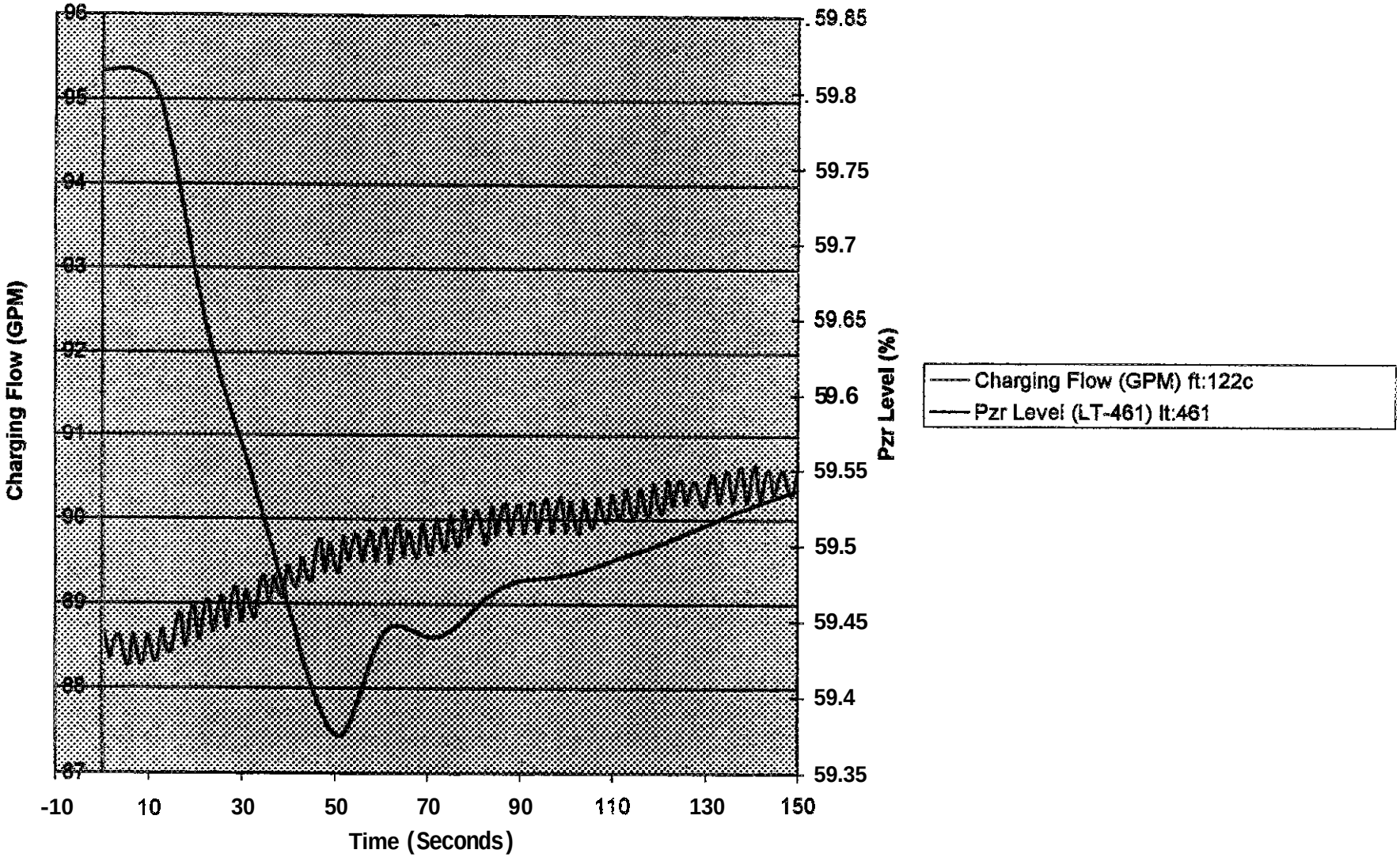
Additionally, PZR backup heaters will energize as RCS pressure lowers to below 2210 PSIG.

Answer B is incorrect, regardless of whether or not the examinee considered this as a BZR steam space LOCA, where charging flow and actual PZR level would both rise, or if they took the more conservative approach with a smaller leak rate and determined that charging flow would increase, while actual pressurizer level decreased. Answer B cannot be correct, as charging flow cannot fail in response to an actual pressurizer level fall, no matter what circumstances the examinee considered.


10 GPM Pzr Steam Space Leak
Charging Flow (GPM)
96
95
94
93
92
91
88
89
88
87
Pzr Level (%)
59.85
59.8
59.75
59.7
59.65
59.6
59.55
59.5
59.45
59.4
59.35
-10
10
30
50
70
90
110
130
150
Time (Seconds)
Charging Flow (GPM) ft:122c
Pzr Level (LT-461) lt:461

75 GFM Pzr Steam Space Leak

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59.75
59.7
59.65
59.6
59.55
59.5
59.45
59.4
59.35
-10
10
30
50
70
90
110
130
150
Time (Seconds)
Charging Flow (GPM) ft:122c
Pzr Level (LT-461) lt:461

Associated with each circuit breaker control switch are three breaker status lights: green, amber, and red. Amber indication means that the control switch has been operated to close the associated breaker (i.e., taken to CLOSE and allowed to spring-return to the midposition) and that the breaker has tripped open for some reason other than the switch's being taken to TRIP. Both back-up heater groups aiso have individual control transfer switches (REMOTE, LOCAL) and local control switches (STOP, START) at the evacuation panels. The transfer switch maintains the position selected; the local control switch spring-returns to the midposition.

The control features for both back-up heater group supply breakers are identical. Normally the transfer switch at the CREP, which is a two-position selector switch, is in REMOTE. This transfers circuit breaker control to the switch on the MCB (the remote control switch), which is normally in the midposition. The rnidposition aligns the switch contacts in one of two ways, AFTER TRIP or AFTER CLOSE, depending upon the last breaker position selected. **AFTER TRIP** means that the switch is *in* the midposition after having spring-returned from the TRIP position. ***AFTER* CLOSE** means #*at* the switch is in the rnidposition after having spring-returned from the CLOSE position.

The back-up heater group breaker closes under the following conditions:

- Transfer switch in REMOTE and any one *of* the following:
  - Remote control switch to CLOSE
  - Pressure deviation-tow-25 psi from setpoint, (PB-444F)
  - Level deviation-high+5 percent of span from setpoint (LB-459D)
- Transfer switch in LOCAL and local control switch to START

Question # 15

15. 014K3.02 1

-The Unit is operating at 100% power.
-Annunciator XCP-620(2-5) CMPTR ROD DEV illuminates.

Which ONE of the following is a condition that could cause the above alarm?

A. A Bank step counter malfunction has occurred.

B. A flux tilt of greater than 2%.

C. An error or failure from both DRPI data cabinets.

D. An IPCS computer failure.

Used Summer Bank Question 2122 for idea.
Summer Objective IC-4-16, and 17.

A. Incorrect, this would cause a CMPTR ROD SEQ alarm.

B. Incorrect, this would not cause the above alarm.

***C*.** Incorrect, this would cause a DRPH Alarm Urgent failure.

D. Correct, if the IPCS computer failed this alarm would come in.

Answer: D

Proposed Action:

Accept either choice C or D

Justification:

Answer D *is* taken directly from the list of probably causes outlined in the Annunciator Response Procedure for XCP 620 *2-5* "CMPTR ROD DEV."

Refer *to* the attached Figure 2-3 from the Westinghouse DRPI technical manual. The DRPI cabinets receive a signal from each individual rod *as* to it's position. The signal is then sent to the control board display I/O card, which is in turn sent to the plant computer (IPCS) I/O card and compared to expected rod position based on demand. **If** a discrepancy exists **at** >12 steps, computer point Y2001C generates an alarm on XCP 620, window 2-5, CMPTR ROD DEV. The ARP lists IPCS computer failure (answer D) as a probable cause, along with three other possibilities.

However this *is* not an all-inclusive fist of malfunctions that could cause a computer rod deviation. In discussing the distracters with Rod Steffy, a former Westinghouse rod control system engineer and **current** I&C supervisor at VC Summer, about how DRPI and **the** IPCS interfaced, Rod indicated there were numerous ways that both DRPI data cabinets could either fail *or* create an error, as indicated in answer C, thereby causing a computer rod deviation alarm to be generated by the IPCS plant computer.

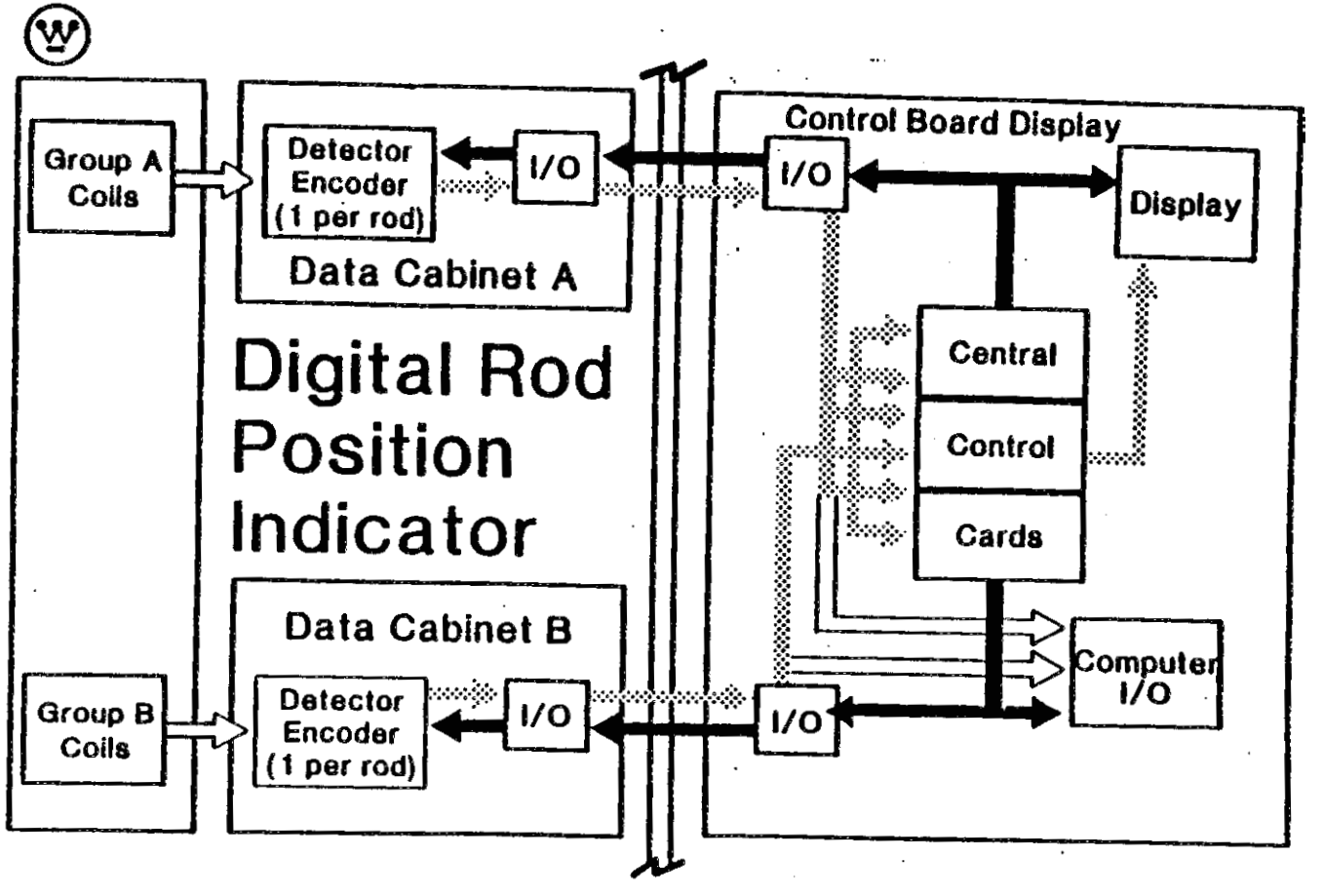
Group A Coils
Detector Encoder (1 per rod)
I/O
Data Cabinet A
Digital Rod Position Indicator
Data Cabinet B
Group B Coils
Detector Encoder (1 per rod)
I/O
Control Board Display
I/O
Display
Central
Control
Cards
Computer I/O
I/O

Fig. 23

COMPUTER INPUT/OUTPUT CARD (Refer to Figures 2.92, 2.93 and **2.94)**

The Computer I/O card is used to interface the DRPI system with any process computer that has contact closure inputs and outputs. Since this method of interface is slow, the DRPI system must be synchronized with, but not slaved to, the computer. Therefore, a memory is provided on the card to contain all information concerning rod position which can be interrogated by the computer at its own speed. The infomation is continuously updated and can be interrogated by the computer at any time (Figure 2.92).

To keep the computer input independent of the Display Card's visual presentation, the Computer I/O card receives the position data from the Display I/O cards. This includes the A Data, the B Data, the Parity Error A, and the Parity Error B.

The Computer I/O card generates a computer interrupt signal each time a data change is detected between two consecutive address cycles.

S3B and S4 outputs from the Central Control Cards are provided to the Computer I/O card's timing circuitry. This timing circuitry divides each address period into three parts. During the first three quarters of each address period, the Central Control Cards control the Computer I/O card in order to determine change in data and to update information in memory. During the last one quarter of each address period, control of the card is given to the computer to interrogate any rod address. During the first one half of each address period. the new data for the addressed rod is stored fn the input latch memories. Simultaneously, the old data for that address is read from the random access memories (RAM's) and applied to a latch memory for future comparison. During the third quarter of the address period, the new data in the input latch memory is written into the RAM's. This data is also applied to a comparator, along with the old data for the same rod. If the comparator detects a change in the new data for the same rod. If the Comparator detects a change in the new data, a computer interrupt signal will be generated. During the fourth quarter of each address period, the computer may address the RAM's. The data corresponding to the computer address is read from the RAM's and applied to a latch memory. The output of this latch memory is available to the computer.

The DRPI address is supplied to the computer I/O sard in order to store data in appropriate RAM's. The computer address is of similar format and will allow the computer to selectively retrieve data.

0115S:4

PANEL XCP-620
ANNUNCIATOR POINT 2-5

CMPTR ROD DEV

SETPOINT:
Rod > 12 steps from bank demand
Rod > 12 steps from reliable average bank position

ORIGIN:
Y2001C

PROBABLE CAUSE:

1. Stuck or misaligned control rod.
2. Dropped control rod.
3. IPCS Computer failure.
4. Rod Supervision Program halted.

AUTOMATIC ACTIONS:

1. None.

CORRECTIVE ACTIONS:

1. Observe the Digital Rod Position Indication display for proper rod positions.
2. Determine if the cause is *a* dropped or misaligned rod.

SUPPLEMENTAL ACTIONS:

1. If a rod is misaligned, refer to AOP-403.5, Stuck or Misaligned Rod.
2. If a rod is dropped, refer to AOQ-403.6, Dropped Control Rod.
3. Operate the Rod Control System in **MAN** as described in SOP-403 until proper automatic Rod Control in restored.
4. Refer to Technical Specification 3.2.3.1.
5. If the IPCS Computer failed, refer to CMPTR SPCS FAIL (XCP-632 6-5).
6. If the cause of the alarm has not been determined, perform the following:
   a. At an IPCS terminal, enter GRPDIS or depress the GRPDIS key.
   b. Enter the group name TASK—MON.
   c. Enter *a* screen update rate.
   d. Verify Y9622, Rod Supervision Calc, is RUNNING.
   e. If Y9622 is HALTED, perform the following:
      1) Contact Nuclear Computer Services.
      2) When the alarm dears, verify Y9622 is RUNNING.
7. if the alarm is inoperable, perform GTP-782, Attachment IV.B, Inoperable Rod Position Deviation Monitor.

REFERENCES:

1. 8-804-620, **Sh.** 2.
2. B-208-074, NI-53.
3. SOP-403.
4. GTP-702.
5. AOP-403.5.
6. AOP-403.6.
7. V.C. Summer Technical Specifications.
8. IPCS Documentation.

Question # 38:

38. 057AG2.1.32 **1**

-The Plant **is** at 100% power during **an** A1 maintenance week.

-APN-5901 **has** been transferred to APN-1FA while work is in progress on XIT-5901.

-The Normal feeder breaker for APN-1FA trips open due to a fault.

Which ONE of the following describes the effect that this will have on the ESFLS system?

A. "A" Train loads will be shed and an ESFLS will be initiated.

B. "B" Train loads will be shed and an ESFLS will be initiated.

C. "A" Train loads will remain connected and ESFLS will be disabled.

D. "B" Train loads will remain connected and ESFLS will be disabled.

Modified from Summer Bank questions 2032, and 4305.

Objective # GS-2-20.

A. Incorrect, this is the correct train, however the loads will not be shed and ESFLS will not be initiated.

B. Incorrect, this is not the correct train, **and** the loads will not be shed and ESFLS will not be initiated.

C. Correct, this is the correct train and the loads will not shed and ESFLS will be disabled.

D. Incorrect, this **is** the wrong train.

Answer: C

Proposed Action:

Accept either choice C. or D.

Justification:

The given conditions have inverter XIT-5901 undergoing maintenance; therefore, APN-5901 is being powered from APN-1FA. The question stipulates that the feeder breaker to **APN-IFA** then trips, de-energizing **APN-IFA.**

Since an undervoltage condition on the vital busses, **IDA** or 1DB is not stipulated, the **ESFLS** on Train B will not be actuated. For the same reason, neither **A** Train nor B Train running equipment will be affected. This makes the first part of Choices C. & **D.** correct.

With APN-IFA supplying APN-5901, **power** to the **A** Train **ESFLS** is lost when the normal feeder breaker to **APN-IFA** trips. Since the second part of Choices C. & D. **does** not specify which Train of **ESFLS** is disabled, the second part would be correct since **A** Train **is** disabled. Said another way, the second part of Choice D. would only be ***incorrect*** if it referred specifically to B Train ESFLS.

VITAL 120VAC AND 125DC

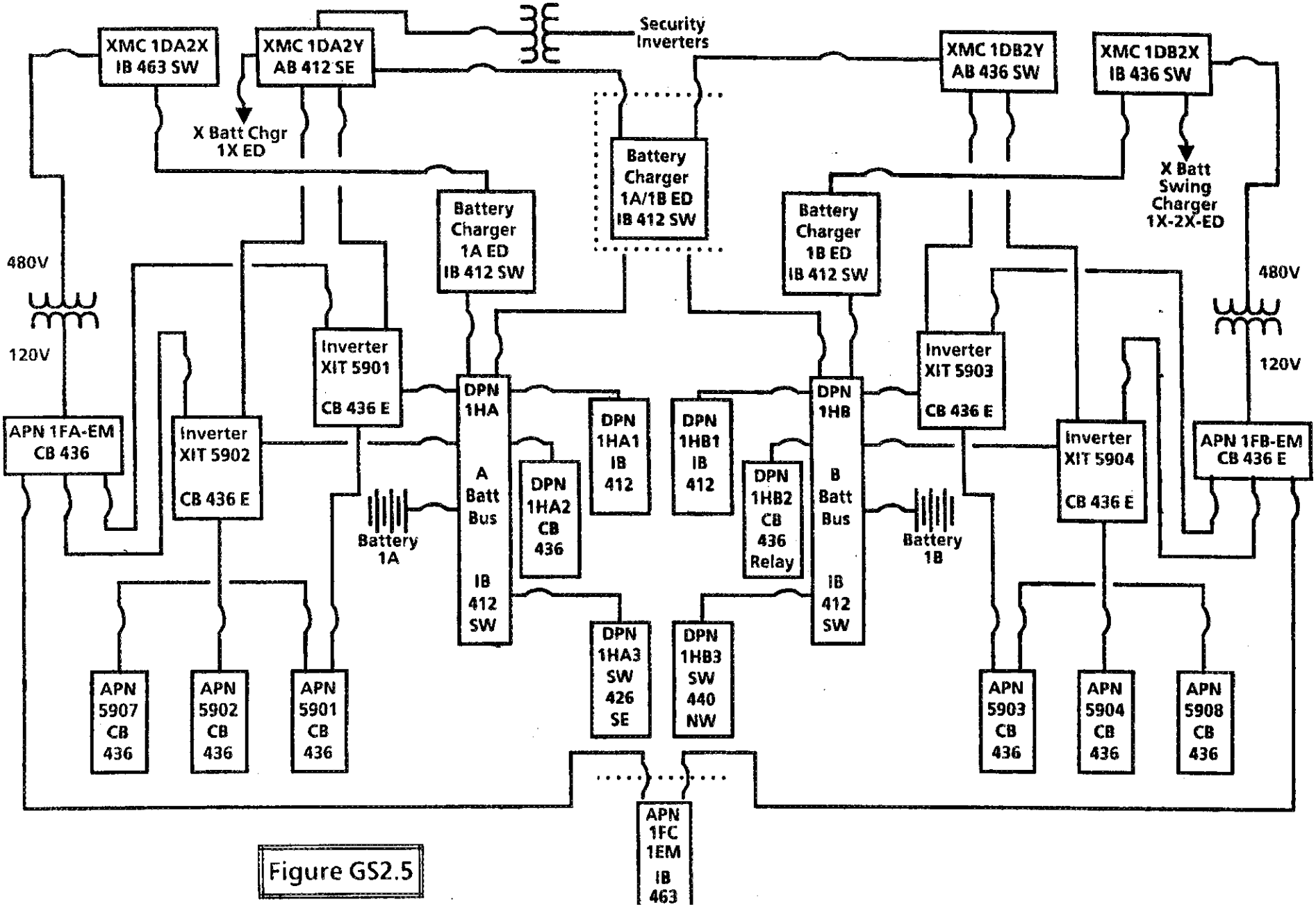

Figure GS2.5

M. REMOVAL OF INVERTER XIT5901 FROM SERVICE

CONTINUOUS USE

Continuous Use of Procedure Required.
Read Each Step Prior to Performing

1.0 INITIAL CONDITIONS

1.1 APN5901, 120V VITAL AC DISTR PANEL 1 NSSS, must remain energized.

1.2 APN1FA, 120 VOLT AC INST MAIN DISTR PANEL 1FA. is energized.

1.3 APN-1FA-EM 19, ALT SOURCE FOR APN5901 VIA XIT5901, is closed.

1.4 OR XIT5901, 120 VOLT VITAL AC 10KVA UPS, the ALT AC SOURCE Breaker is closed.

1.5 The MAN. BYPASS Switch is in the NORMAL position.

1.6 The TEST TRANSFER Switch is in the center position.

CAUTION 2.0

Placing APN5901, 120V VITAL AC DISTR PANEL 1-NSSS, on ALT SOURCE from APNIFA, 120 VOLT AC INST MAIN DISTR PANEL 1FA, will prevent Train A Engineered Safety Features Load Sequencer from operating during a Blackout condition.

2.0 INSTRUCTIONS

2.1 Verify that the SYNC MONITOR Light is not lit.

2.2 Place the TEST TRANSFER Switch to the ALT position.

2.3 Verify the following:

a. The ON ALTERNATE Light illuminates.

b. The ON INVERTER Light goes out.