31535

Sta 195

INSTRUCTIONS FOR LOADING COMPUTER PROGRAM AND TRANSFERRING STATION TO COMPUTER CONTROL

9-1-77

68v
#4

TABLE OF CONTENTS

CONTROL PANEL DESCRIPTION

To load the station program and transfer the station to local or remote computer control one must be able to identify the four control panels referred to in the attached instructions.

1. STATION (NGPL) CONTROL PANEL

This panel contains the mimic display of the various valves and yard piping and includes several chart recorders and instruments.

2. UNIT CONTROL PANEL

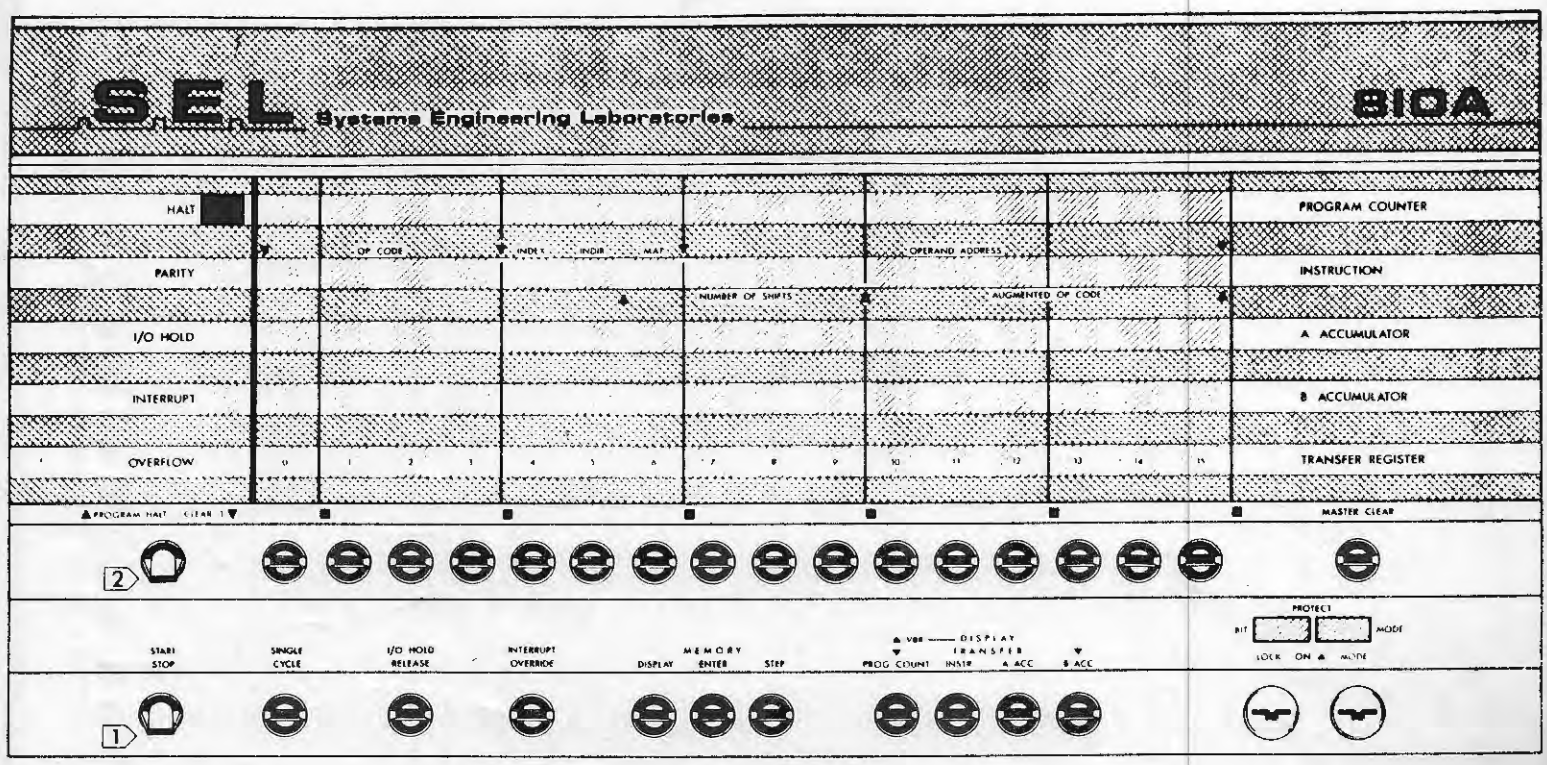
The panel made by the manufacturer of the turbine and may contain an SPC controller as well as other controls for starting the unit manually.

3. COMPUTER CONSOLE CONTROL PANEL

The panel located in the top portion of the computer containing five horizontal rows of lamps with numerous switches. Refer to figure, Page 2.

4. D/C (DATA CONTROL) CONSOLE PANEL

The data control console panel contains the three data nixie displays as well as various control switches for entering setpoint and transferring station from standby to local and remote control. Refer to figure, Page 4.



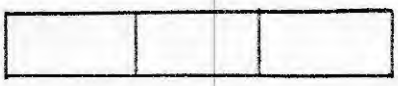
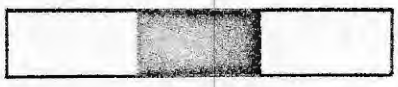
COMPUTER CONSOLE CONTROL PANEL

OCTAL NUMBER SYSTEM (COMPUTER SHORTHAND)

The computer operates with 16 bit binary words. A binary word consists of a combination of 1's and 0's. To reduce the complexity of programming the computer using 1's and 0's, the process has been simplified by converting the binary system to an octal number system.

The octal number system is used to manually enter computer instructions through the control panel. This number system consists of 8 numbers from 0 to 7. The 16 indicator lights, numbered 0 to 15, in the transfer register of the computer console control panel are divided into groups of three except for the indicator light "0" which is alone.

Counting from the right in a group of three indicator lights, the first light represents a 1, the second a 2 and the third a 4. All numbers (0-7) are formed from these digits by addition and are referred to as octal numbers.

OCTAL NUMBER		COMPUTER REPRESENTATION (4 2 1)
0	=	
1	=	
2	=	
3	=	
4	=	
5	=	
6	=	
7	=	

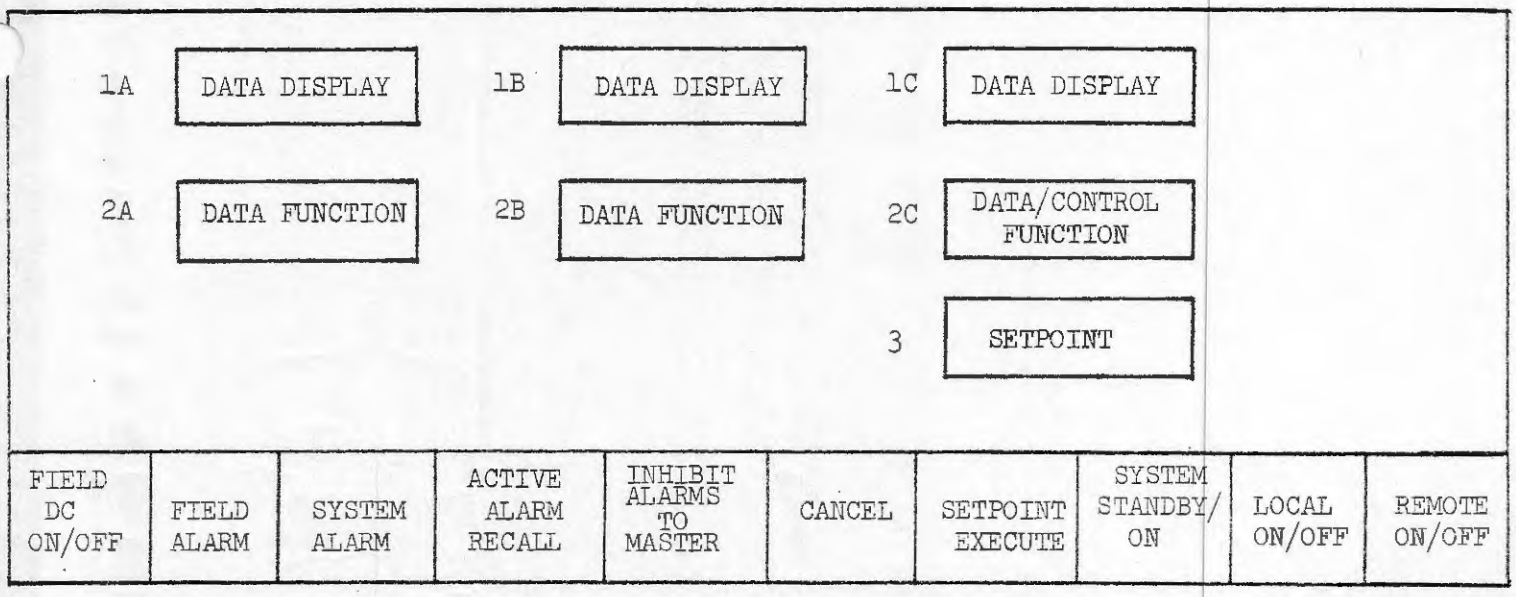
 indicates light off

 indicates light on

Examples:

1. The octal number 037673 is represented in the T-Register as

2. The octal number 001020 is represented in the T-Register as



D/C (DATA CONTROL) CONSOLE PANEL

The D/C console panel provides the ability to control and display data.

A description of the console panel follows.

1A-1C Three Data Displays.

2A,2B Data Function Thumbwheel Switches.

2C Data and Control Function Thumbwheel Switches.

3. Setpoint Thumbwheel Switch.

4. FIELD DC ON/OFF: Field DC Must Be On When Station Is In Computer Control.

5. ALARM FUNCTIONS: There are two types of alarms.

   a) System alarm: Indicates an alarm condition with the D/C station.

   b) Field alarm: Indicates an alarm condition with the compressor station.

When the light of the System or Field Alarm is red, it indicates an alarm condition. When either of these alarms occur with the D/C system in a control mode, the audible alarm will come on with an intermittent flashing red light. The audible alarm and flashing light can be silenced by pressing silence button on station panel.

6. ACTIVE ALARM RECALL: The station operator can request a typewritten list of all present field and system alarms by pressing the "Active Alarm Recall" switch on the D/C console panel.

Boiler checks

7. INHIBIT ALARM TO MASTER: This light is normally off. When red, it indicates no alarms are being transmitted to Chicago. This light will turn red for approximately 2 minutes after starting program. To inhibit alarms from being transmitted to Chicago, dial in function 72 in thumbwheel switch 2C and enter 0-120 minutes in setpoint switch 3, then press setpoint execute. Function 72 will display the delay time. To remove delay time, enter 72 in switch 2C and all zeros in setpoint switch 3, and press setpoint execute switch.

8. CANCEL SWITCH: After pressing the system, Local or Remote switch on the D/C console panel and before pressing Setpoint Execute, to cancel all the settings, press the cancel switch. This action will reset the console switches to their last state.

9. SETPOINT EXECUTE: The Execute light is normally off. The button is provided to actuate the operator's selection. When pressing the switch, the light will change to red, and upon execution of command it will return to off.

10. SYSTEM ON/OFF: A green light indicates the system is in the standby mode, a red light indicates the system is in the system-on mode.

11. LOCAL/REMOTE ON/OFF: The green light indicates the off condition. A red light indicates the on condition or operating mode.

Output Status Panel

The output status panel indicates by lamps the control outputs issued by the computer. The indicator lamp will remain lit, even though the computer may no longer be issuing that output, until the computer cancels the output or issues the opposite command.

Typewriter

The remote D/C station uses the typewriter to inform the station operator of alarms, changes in operating procedures and data. The typewriter should always be kept on-line.

LOAD STATION PROGRAM IN COMPUTER AND TRANSFER TO REMOTE CONTROL

If the program loader No. 300001E is stored in the computer memory it will not be necessary to enter the bootstrap or loader tape. Proceed with the following steps to load the station program.

Step 1. Load station program tape, Step C, Page 8.

Step 2. If station program tape loaded satisfactorily move to Step 6. If tape did not load, move to Step 3.

Step 3. Enter manual bootstrap, Step A, Page 7.

Step 4. Load program tape No. 300001E, Step B, Page 8.

Step 5. Load station program tape, Step C, Page 8.

Step 6. Place station in local or remote computer control, Step D, Page 9.

Step 7. To monitor pressures, speed or temperatures, see Step G, Page 10.

Step A. MANUAL BOOTSTRAP

The manual bootstrap is a computer program consisting of the following octal numbers:

PROGRAM LOCATION OCTAL ADDRESS	OCTAL NUMBER
0	130101
1	004000
2	170301
3	000022
4	111006
5	111002
6	170301
7	001016
10	174301
11	033016
12	000022
13	000026
14	113017
15	111006
16	137671
17	037673

To enter the manual bootstrap in the computer, turn panel key clockwise.

1. Depress the MASTER CLEAR switch.
2. Load octal number (130101) into transfer Register.
3. Skip next instruction.
4. Load octal number in transfer register -
5. Depress MEMORY ENTER switch.
6. Depress MEMORY STEP switch.
7. Depress PROGRAM HALT/CLEAR T switch.
8. Load second octal number (004000) of bootstrap into T-Register.
9. Repeat Steps 5, 6 and 7.
10. Repeat Steps 4 through 7 for remaining octal numbers. Not first 2
11. After the seventeen octal numbers are entered in the computer, depress MASTER CLEAR switch.

The bootstrap is used to load the program loader tape No. 300001E, see next page.

Step B. PROGRAM LOADER TAPE NO. 300001E

1. Turn tape reader power on.
2. Raise tape reader lever arm.
3. Place the tape in tape reader.
4. Pull tape reader lever arm to full forward extension and lower on top of tape.
5. Depress MASTER CLEAR switch.
6. Depress START/STOP switch on computer control panel twice.
7. If program loader fails to load, recheck bootstrap, refer to Page 6A, reposition tape and move back to Instruction 5.
8. The tape reader will read tape and halt near end of tape.
9. Depress MASTER CLEAR switch.
10. Raise lever arm on tape reader and remove tape.

Step C. STATION PROGRAM TAPE (TAPE WITH STA. NO. AND DATE)

To load the station program into the computer, turn control panel key clockwise.

1, 2, 3, 4. Follow Step 1-4 above, then return to Step 5 below.

5. Depress MASTER CLEAR switch.
6. Load octal number 037673 into transfer register.
7. Depress PROG count switch.
8. Depress PROGRAM HALT/CLEAR T switch.
9. Raise Switch 1 under indicator light 1.
10. Depress START/STOP switch twice.
11. Tape reader will read tape and come to a normal halt at end of tape.
12. If the typewriter types K after loading a tape, this indicates an incorrect loading. Check the last 3' of tape that passed through the reader head for dust, tears or plugged holes and restart with Step 1.
13. Remove tape and turn power OFF to tape reader.
14. Center Switch 1.
15. Depress MASTER CLEAR switch.
16. Load octal number 001020 into transfer register.
17. Depress PROG count switch.
18. Depress PROGRAM HALT/CLEAR T switch.
19. Depress START/STOP switch twice.

Step D. LOCAL - REMOTE CONTROL MODE

1. Put engine panel(s) in computer mode. (D/C station or remote).
2. Put NGPL station panel in automatic computer mode (Press Auto-Computer switch).
3. Press LOCAL ON switch on D/C console panel.
4. Press SYSTEM ON switch.
5. Press SETPOINT EXECUTE switch.
6. Enter Function 70 under right data display.
7. Enter 0712 in SETPOINT switch under same display.
8. Press SETPOINT EXECUTE switch.

   The station is now in local control mode. To start or stop a unit, refer to instructions on Page 10 before executing the next two instructions (9 & 10) to transfer the station to remote control.

9. Press REMOTE ON switch on D/C console.
10. Press SETPOINT EXECUTE switch.

Step E. STANDBY MODE

In standby mode, the computer will not control the station. To put the station in standby mode:

1. Press SYSTEM STANDBY switch.
2. Press SETPOINT EXECUTE switch.
3. Switch unit panels to local mode.
4. Put NGPL station panel in Foxboro or Motorola control (Press Foxboro-manual switch.

Start up

Step F. CONTROL SETPOINTS

DESCRIPTION	FUNCTION NO.	SETPOINT NO.
Discharge pressure setpoint	70	0450-0712
Unit 1 start	91	0001
Unit 2 start	91	0002
Unit 1 stop	92	0001
Unit 2 stop	92	0002

To issue a discharge pressure setpoint, start or stop a unit:

1. Put station into local control mode. (See Page 9).
2. Dial function number into CONTROL FUNCTION thumbwheel.
3. Dial the setpoint number into the SETPOINT thumbwheel.
4. Press SETPOINT EXECUTE switch.

Data may be displayed by entering the data function number under the display.

Step G. DATA FUNCTIONS

Number	Data	Number	Data
00	Mainline suction pressure	56	Mainline discharge temperature
07	Mainline discharge pressure	63	Atmospheric temperature
08	Station discharge pressure	64	Suction temperature - Unit 1
10	*RPM-Unit 1 (1st 3 digits)	65	Suction temperature - Unit 2
11	*RPM-Unit 2 (1st 3 digits)	67	**Exhaust temp.-Unit 1 (last 3 digits)
26	No. of Units in operation	68	**Exhaust temp.-Unit 2 (last 3 digits)
43	Suction pressure-Unit 1	41	Fuel gas pressure
44	Suction pressure-Unit 2	42	Fuel gas temperature
50	Mainline suction temperature	59	Fuel flow based on DP and static-Unit 1

*RPM Data: 4517 RPM will be displayed as 451.
**Exhaust temp: 1045° will be displayed as 045°.

ALARMS AND DIAGNOSTIC MESSAGES

All alarms will be indicated by a typewritten message. When the D/C station is in a control mode, all alarms will be accompanied by a flashing red light and horn. To silence the horn and stop flashing light press SILENCE switch on the NGPL panel. The red light will remain on until all alarms are cleared.

The station operator can request a typewritten list of all present alarms by pressing the active alarm recall switch on the D/C console panel.

After receiving a start unit command, the D/C system will clear all field alarms. If they are still present, the D/C system will again issue this field alarm.

FIELD ALARM MESSAGES

1. NEG STA DIFF PRESS

   The D/C system must be in a control mode. If the suction pressure is higher than discharge pressure by 10 psi, the computer will open recycle valve and remove the close block valve signal. When discharge pressure becomes equal or greater than suction pressure, the computer will close recycle valve and clear alarm.

2. MIN LOAD WARNING

   All units are at minimum speed (3950) and discharge pressure is equal or greater than setpoint. If this condition remains for 30 minutes, the D/C system will shut down one unit.

3. SURGE VALVE OPEN OVER 5 MIN.

   With the D/C system in a control mode and one or more engines on line, the alarm will be generated if surge valve remains open for more than 5 minutes.

4. NO PRESS SETPOINT

   The D/C station is in a control mode without a pressure setpoint.

5. STA OPER NOT ALLOW

   Insufficient number of station sidegates open for station operation by D/C system.

One Unit Operation Requires

A. One 36" Line Open

B. Or The 24" And 26" Line Open

Two Unit Operation Requires

A. One 36" And 24" Lines Open

B. One 36" And 26" Lines Open

C. Two 36" Lines Or More Open

6. STA DID NOT LOAD

Difference between station discharge and suction pressure remains less than 30 psi after computer commanded block valves to close.

7. HI DISCH PRESS

Foxboro high discharge pressure alarm unit detected station discharge pressure of 720 psi. All units running will be stopped immediately via the Foxboro alarm unit signal.

8. SUCT SIDEGATE CLOSED

With the D/C station in a control mode and the computer starting an engine or controlling an on-line engine, the alarm will be generated if one or more suction sidegates are closed.

9. DSCH SIDEGATE CLOSED

With the D/C station in a control mode and the computer starting an engine or controlling an on-line engine, the alarm will be generated if one or more discharge sidegates are closed.

10. RCVL DID NOT CLOSE

With D/C station in a control mode and one engine on-line, this alarm will be generated if the recycle valve did not close.

11. MAIN BLOCK NOT CLOSED

With D/C station in a control mode and one engine on-line, the alarm will be generated if one or more block valve did not close.

12. MAIN BLOCK TROUBLE

With the D/C station in a control mode and one engine on-line, the alarm will be generated if one of the main block valves is open for a period of over 5 minutes.

13. LINE BREAK ALARM

A line break has been detected on the mainline.

14. LINE BREAK LOCKOUT TOO LONG

After a line break has been detected on the mainline and the automatic cutoff system has not been reset after 5 minutes, the alarm will be generated.

15. UNAUTHORIZED ENTRY

Reference Prints: 191-192-50-E4 (4)
193-199-31-E26 (5 & 7)

16. FIRE-MAIN BLDG

Reference Prints: 191-192-50-E4 (4)
193-199-31-E26 (9)
191-199-31-E23

Computer will issue an emergency station blowdown if D/C station is in a control mode.

17. FIRE-AUX BLDG

Reference Prints: 191-192-50-E4 (4)
191-199-31-E23 (6)
193-199-31-E26 (6)

18. GAS DETECTED

Reference Prints: 191-192-50-E4 (5)
193-199-31-E26 (6)
191-199-31-E24

19. EMER STA BLOWDOWN

Reference Prints: 191-192-50-E4 (4)
191-199-31-E23
193-199-31-E26 (3)

If D/C station is in a control mode, it will stop all engines, and issue a station blowdown. The computer will then transfer the D/C station to standby mode.

20. STA PANL NO COMP MODE

Reference Prints: 191-192-50-E4 (1)
193-199-31-E26 (1)

NGPL station panel is not in automatic computer mode.

THE FOLLOWING ALARMS, (ALARM 21, 22 AND 23) ARE FOR REMOTE STATION ONLY. THESE ALARMS WILL NOT BE SENT TO CHICAGO GAS CONTROL CENTER.

21. XDUCER OUT OF CALIBR

The difference between the station and mainline discharge pressures exceeds 10 psi. Also mainline suction & Discharge when station is down.

22. SURGE VALVE OPEN

23. BOILER ALARM

Reference Prints: 191-192-54-E4 (4)
193-199-31-E26 (6)

THE FOLLOWING ALARMS ARE UNIT ALARMS AND THEY WILL NOT BE SENT TO CHICAGO MASTER CONTROL CENTER IF THE ENGINE PANEL IS NOT IN COMPUTER CONTROL MODE AND THIS UNIT IS NOT OPERATING, STARTING OR STOPPING.

24. UNIT (1,2) NO PERM START

Reference Prints: 191-192-54-E4 (8B)
193-199-31-E26 (10,11)

Unit does not have a permissive start.

25. UNIT (1,2) FUEL VALVE NOT ON

Reference Prints: 191-192-54-E4 (8)
193-199-31-E26 (1,2)

Unit fuel valve did not open when commanded to do so by computer before start of engine.

26. UNIT (1,2) IN STRT SEQ. FAILD

Reference Prints: 191-192-54-E4 (8B)
193-199-31-E26 (10,11)

27. UNIT (1,2) INCMPLT SEQ SIGNAL

Reference Prints: 191-192-54-E4 (8B)
193-199-31-E26 (10,11)

28. UNIT (1,2) FAIL TO START

Alarm will be generated if speed drops below 500 RPM during warm up period.

29. UNIT (1,2) DID NOT LOAD

Unit failed to load after a computer start or after the compressor speed reaches warm up speed (above 1000 rpm) and drops below 500 rpm.

30. UNIT (1,2) FAIL TO REACH MIN SPEED

Unit failed to reach a minimum speed (3950 rpm for Station 192 to 199, and 3400 rpm for Station 191) after a computer start.

31. UNIT (1,2) LOW SPEED

The speed of a unit drops below 3400 rpm (2700 rpm for Station 191) for more than 15 seconds, the computer will shut down this unit.

32. UNIT (1,2) HIGH SPEED

If the speed of a unit consecutively exceeds high shutdown compressor speed for 15 seconds, the computer will shut down this unit.

ENGINE	SHUTDOWN SPEED
Cooper Bessemer	5500 RPM
Ingersol Rand	5500
Clark	5800
De Laval	6500

33. UNIT (1,2) HIGH PRESS SHUTDOWN

The computer will shutdown the unit after the discharge pressure exceeds 718 psi for 25 seconds.

34. UNIT (1,2) MIN PWR SHUTDOWN

The computer will shutdown the unit if the discharge pressure is equal to or higher than the pressure set-point and on-line unit(s) have been running at minimum speed for 30 minutes. (3950 RPM for Station 192-199 and 3400 for 191)

35. UNIT (1,2) MALFUNC SHUTDOWN

Reference Prints: 191-192-54-E4 (8B)
193-199-31-E26 (10,11)

The D/C station will shutdown the unit after a malfunction shutdown alarm of the unit has been detected. The computer will shutdown the other unit, if it is running.

36. UNIT (1,2) FLOW DET, UF CLOSED

Reference Prints: 191-199-42-E4

After a computer stop of the unit, the fuel flow was detected although fuel valve was closed. The D/C system will immediately issue an emergency station blowdown.

37. UNIT (1,2) FLOW DET

Reference Prints: 191-199-42-E4

See Alarm 36.

38. UNIT (1,2) MANIFOLD NOT SAFE

Reference Prints: 191-192-54-E4 (8B)
193-199-31-E26 (10,11)
191-199-31-E23

The unit manifold valves are not in safe shutdown position after a computer stop of the unit. The D/C system will immediately issue an emergency station blowdown.

39. UNIT (1,2) NO FLOW, UF OPEN

Reference Prints: 191-199-31-E23
191-199-42-E4
191-192-50-E4 (8)
193-199-31-E26 (1,2)

After a computer stop of a unit the fuel valve failed to close although no fuel flow was detected, the D/C system will not blowdown the station.

40. UNIT (1,2) PANL NO COMP MODE

Reference Prints: 193-199-31-E26 (10,11)

Engine panel is not in D/C station mode.

THE FOLLOWING TWO UNIT ALARMS ARE FOR REMOTE STATION ONLY. THEY WILL NOT BE SENT TO CHICAGO MASTER CONTROL CENTER.

41. UNIT (1,2) MALFUNC WARNING

Reference Prints: 191-192-50-E4 (8B)
193-199-31-E26 (10,11)

This alarm will not shut down the unit when detected. The D/C system will issue a 5 seconds alarm reset and if the alarm still remains, the computer will issue a reset after a two minute delay.

42. UNIT (1,2) DIDN'T SLOW TO IDLE

During engine stop sequence, the computer failed to reduce engine speed to idle in order to stop the unit.

SYSTEM ALARM MESSAGES

NOTIFY COMMUNICATION DEPARTMENT IMMEDIATELY WHEN RECEIVING THESE ALARMS.

1. CLOCK FAILURE

   Computer digital clock failed. Computer program will put D/C station into standby mode.

2. RM TEMP SHUTDOWN

   Control room temperature inside computer exceeds 85°. D/C station will go to standby mode. Program should be reloaded into computer.

3. RM TEMP WARN

   Control room temperature inside computer exceeds 75°.

4. A/D FAILURE

   Analog to digital converter is malfunctioning. Data will be incorrect. D/C station will go to standby mode.

5. FIELD DC OFF

   Field D.C. input power to the D/C station is off. D/C station will go to standby mode.

DIAGNOSTIC MESSAGES

1. LOC/STDBY CONTROL

   The D/C station is not in remote control mode.

2. UNIT (1,2) LOADED

   Unit changes its status from off-line to on-line operation.

3. UNIT (1,2) STOPPED

   Unit changes its status from on-line to off-line operation.

4. AC FAILED

   AC power to the D/C station failed.

5. CHANGE IN STA OPER

   During AC power failure there was a change in the position of a field valve or a unit was started or stopped.

6. UNIT (1,2) START NOT PERMITTED

   If any one of the following conditions exists, starting of the unit is prohibited.

   a. Mainline suction or discharge sidegates did not open at the time of starting the unit.

   b. The unit is already on-line.

   c. The unit is in stopping sequence.

7. WRONG PUSHBUTTON SELECTED

8. INVALID REQUEST

9. MEM/PROGRAM TROUBLE

   The computer system (hardware or software) is in trouble. Reload the program or call for maintenance personnel.

10. (NO OF) SUCT SIDEGATE (SS24 etc.), (NO OF) DSCH SIDEGATE (DS26 etc.), (NO OF) MAIN BLOCK VALVE (MB36 etc.), RECYCLE VALVE, OR (NO OF) FUEL VALVE FOUND MOVING.

    The valve was found moving out of original position without command by computer.

11. (NO OF) VALVE NOT YET CLOSE OR OPEN

    A field valve fails to close or open upon command by the computer.

12. (NO OF) VALVE NOW OPEN OR CLOSE

    The valve moves back to the original open or close position.

WATCHDOG RELAY

Reference Prints: 191-192-50-E4 (1)
193-199-31-E26 (1,4)

Every 10 seconds the computer program will strobe the watchdog relay. If the computer program is malfunctioning in the computer, it will fail to strobe the watchdog relay. If the watchdog relay times out 50 seconds without being strobed, it will turn off the field DC output power from the D/C station and remove the NGPL station panel from automatic computer mode. The Foxboro setpoint controller will take over discharge pressure setpoint control.

INSTRUCTIONS FOR MAKING A PROGRAM
CHANGE THROUGH THE CONTROL PANEL

1. Reload Station Program
2. Press MASTER CLEAR Switch
3. Enter _____ in TRANSFER REGISTER
4. Press PROGRAM COUNT Switch
5. Press DISPLAY Switch, the TRANSFER REGISTER should display _____ .
6. Press CLEAR T Switch
7. Enter _____ in TRANSFER REGISTER
8. Press MEMORY ENTER Switch
9. Press DISPLAY Switch; the TRANSFER REGISTER should display _____ and the PROGRAM COUNTER should display _____ .
10. Press MASTER CLEAR Switch
11. Start Program at normal location

Note: The above instructions assume all control panel lamps are operational associated with the program change.

NGPL

INTER-OFFICE CORRESPONDENCE

DATE November 18, 1977

SUBJECT Revision of Intermediate Station Computer Control Program

TO All Intermediate Station Superintendents

FROM L. H. Hsu L.H. Hsu

As a result of the installation of the station line break protection system that will close the main block valve and the discharge sidegate of the line if a line break has been detected, the following change in the station computer program will be incorporated in the November 18, 1977 program tape.

When a line break is detected, the computer program will give a line break alarm and will not output commands to the discharge sidegates and main block valves until the line break alarm has been cleared and the line break lockout has been reset. This will allow the station line break protection system to function without interference from the computer system.

The following changes are the corrections of the tape that is presently operating at the station.

1. Unit number correction on the low speed warning type out and miscellaneous type out correction.

2. On engine stop sequence: (Refer to Operating Manual 6.3 on page 34.)

   a. The computer program will alow the combined time to 30 minutes to decrease compressor speed to 3600 RPM. (Old time was 15 min.)

   b. Delay for 5 minutes. (Old time was 10 minutes.)

   c. During the stop sequence, the surge valve opens, the D/C system will release the decrease speed command and check the surge valve close every 30 seconds. If the surge valves fail to close within 4 minutes, the D/C system will decrease the compressor speed to 1500 RPM within 15 minutes. (Old time was 8 minutes.)

LHH:dm

cc: Messrs. M. J. Findling
L. A. Lowry
C. L. Thompson
R. L. Hancock
N. C. Mayo

Date October 23, 1987

Subject The Station 195 Computer Program Modifications for the Mainline Suction Pressure Range

To Mr. J R Kelley, Supt. From L. H. Hsu

L. H. Hsu

The enclosed new tapes dated October 23, 1987 are the duplicated copies of the old tapes dated March 11, 1981. These tapes are made at the request of the Transmission division in order to incorpoarted for the Mainline Suction Pressure Range from 300 psi to 800 psi at station 195.

If you use Oct 22, 1987 tape

Change Memory Location 21043 from 1440 to 1274

Change Memory Location 20771 from 1310 to 1274

LHH/LH

cc: Messrs. R. Jepsom
R. Link