

SOFTWARE CONTROL DESCRIPTION

OXNARD SCHOOL DISTRICT
TESCO JOB # T34350

Rio Mesa High School P/S

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SEQUENCE OF OPERATION

The L2000 Controller (PLC) performs local pressure monitoring, auto-atic start / stop control for three (3) water pumps, two (2) well pumps and one (1) air compressor, alarm detection and generation.

PROGRAM DESCRIPTION

PLC Power: is continuously monitored by the L2000. A battery within the L2000 maintains program and setpoint data, which enables control functions to resume without operator intervention after power loss.

Digital Inputs: representing station power status, hydro tank level, etc. are continuously sampled by the L2000. Should a failure status be detected for more than the respective delay setpoint interval (seconds), the appropriate alarm is generated. Refer to the chart for detailed input, alarm and setpoint assignments.

DIGITAL INPUT	D.I.#	Delay sec	Alarm reg
A/C Phase Fail	S29	SP15	S95
120 A/C Power Fail	S30	SP16	S96
PLC D/C Power Fail	S31	SP17	S97

Analog Inputs: representing level and pressure are continuously sampled by the L2000. Should a value above or below assigned setpoint limits be detected, for more than the respective delay setpoint interval (seconds), the appropriate alarm is generated. Control registers are provided for zero-clamped display. Refer to the chart for detailed input, alarm and setpoint assignments.

TRANSDUCER VALUES	S-Press psi	Level in	H-Press psi
Analog Input	L0	L1	L2
Control Reg.	AO10	AO11	AO12
XDUCR Low	SP81	SP85	SP89
" High	SP84	SP88	SP92
" delay	SP01	SP05	SP08
LOW Value	SP82	SP86	SP90
" delay	SP02	SP06	SP09
HIGH Value	SP83	SP87	SP91
" delay	SP03	SP07	SP10

Pump Calls: for the two (2) well pumps are issued by the L2000 when the respective H-O-A switch is in the "auto" position. Running indication for the pumps are monitored and reported by the L2000. Specific calls are issued, after applicable re-start (SP32 sec) and/or sequential start (SP39 sec) delays have elapsed, based upon the following criteria and priority:

- Well Pump*
- 1) L2000 Auto - L2000 issues "primary" well pump calls based upon the "well pump call switch" digital input:
 - a) Pump Start-> input active for more than SP11 _____ seconds.
 - b) Pump Stop -> input not active. (off)

Well Pump Call Sequence: is selected via a panel mounted switch. Only (1) one well pump (P1 or P2) may be assigned as the primary pump.

Back-up Well Pump Calls: are issued to the next pump in sequence should the primary pump become "un-available". A pump is un-available when any "failure" alarm is active or H-O-A switch is not in auto.

Well Pump Interlocks: which inhibit L2000 auto pump start calls are set if any (OR) condition is true and re-set when all (AND) are false based upon the following:

A/C Phase Fail

Well Pump Performance: is continuously monitored and reported by the L2000. The following conditions will result in the respective "pump fail" alarm being generated and pump being called off:

NOTE: storing a value < 1 in the delay SP disables the alarm(s).

- a) Pump "running" digital input did not detect a running status within the "delay" setpoint interval (seconds) from the respective pump start call being issued.

DIGITAL INPUT	D.I.#	Delay	Alarm
Pump 1 Running	S13	SP26	S76
Pump 2 Running	S17	SP28	S78

- b) Pump "overload" digital input was active for more than the "delay" setpoint interval. (seconds)

DIGITAL INPUT	D.I.#	Delay	Alarm
Pump 1 Overload	S14	SP27	S77
Pump 2 Overload	S18	SP29	S79

Pump Calls: for the three (3) water pumps are issued by the L2000 when the respective H-O-A switch is in the "auto" position. Running indication for the pumps are monitored and reported by the L2000. Specific calls are issued, after applicable re-start (SP31 sec) and/or sequential start (SP39 sec) delays have elapsed, based upon the following criteria and priority:

- 1) L2000 Auto - L2000 issues water pump calls based upon the system pressure:
 - a) Pump Start -> pressure below SP for call delay interval. (seconds)
 - b) Pump Stop -> pressure above SP for call delay interval. (seconds)

Water Pump

	System Pressure		Call Delay
SP71	_____ _____	Lead Pump Stop	SP34 _____
SP72	_____ _____	Lag Pump Stop	SP36 _____
SP73	_____ _____	Lag1 Pump Stop	SP38 _____
SP41	_____ _____	Lead Pump Start	SP33 _____
SP42	_____ _____	Lag Pump Start	SP35 _____
SP43	_____ _____	Lag1 Pump Start	SP37 _____

Water Pump Call Sequence: is determined by the value stored in set-point 100. Valid entries are; 1 = pump 1 lead, 2 = pump 2 lead or (0) zero. Water pump 3 is always the lag1 pump. Alternate lead pump occurs when all pumps have been called off and/or when the lead pump has been called on for more than SP interval. (hours) Invalid entries results in 1-2-3 sequence.

- SP100 -> 0 = Auto Alternate
 # = Lead Pump # (1 or 2)
- SP102 -> _____ hrs = Run-time Alternate (< 1 = disable)

Back-up calls are issued to the lag pump, should the lead become "un-available". A pump is un-available when its' respective "failure" alarm is active or H-O-A switch is not in auto.

Water Pump Interlocks: which inhibit L2000 auto pump start calls are set if any (OR) condition is true and re-set when all (AND) are false based upon the following:

- System Pressure Xducr Fail
- System Pressure High
- Hydro Tank Level Xducr Fail
- Hydro Tank Level High
- Hydro Tank Pressure Xducr Fail
- Hydro Tank pressure High
- A/C Phase Fail

Water Pump Performance: is continuously monitored and reported by the L2000. The following conditions will result in the respective "pump fail" alarm being generated and pump being called off:

NOTE: storing a value < 1 in the delay SP disables the alarm(s).

- a) Pump "running" digital input did not detect a running status within the "delay" setpoint interval (seconds) from the respective pump start call being issued.

DIGITAL INPUT	D.I.#	Delay	Alarm
Pump 1 Running	S01	SP20	S70
Pump 2 Running	S05	SP22	S72
Pump 3 Running	S09	SP24	S74

- b) Pump "overload" digital input was active for more than the "delay" setpoint interval. (seconds)

DIGITAL INPUT	D.I.#	Delay	Alarm
Pump 1 Overload	S02	SP21	S71
Pump 2 Overload	S06	SP23	S73
Pump 3 Overload	S10	SP25	S75

Air Compressor Calls: for the one (1) compressor are issued by the L2000 when the respective H-O-A switch is in the "auto" position. Running indication for the compressor is monitored and reported by the L2000. Specific calls are issued based upon the following criteria and priority:

- 1) L2000 Auto - L2000 issues compressor calls based upon the hydro tank pressure:
 - a) Cmpsr Start -> pressure below SP47 45 psi for more than SP12 seconds.
 - b) Cmpsr Stop -> pressure above SP77 55 psi OR xducr fail alarm active.

Air Compressor Interlocks: which inhibit L2000 auto start calls are set if any (OR) condition is true and re-set when all (AND) are false based upon the following:

Hydro Tank Water Level below SP48 30 inch
 Water Pump(s) Running

Air Compressor Performance: is continuously monitored and reported by the L2000. The following conditions will result in the respective "air compressor" alarm being generated and compressor being called off:
 NOTE: storing a value < 1 in the delay SP disables the alarm(s).

- a) Compressor "running" digital input did not detect a running status within the "delay" setpoint interval (seconds) from the respective compressor start call being issued OR start call is active for more than "delay" setpoint interval.

DIGITAL INPUT	D.I.#	Delay	Alarm
Cmpsr Running	S21	SP104	S104
Cmpsr Call Active		SP106	S104

-> Start/Stop Fail

- b) Compressor "overload" digital input was active for more than the "delay" setpoint interval. (seconds)

DIGITAL INPUT	D.I.#	Delay	Alarm
Cmpsr Overload	S22	SP105	S105

STATION STATISTICS

Totalization and/or accumulation, of numerous items are stored within the L2000 and may be viewed "examining" the following timers:

L2000 Hours	Timer	10		
A/C Phase Failures	Timer	50		
Water Pump 1-2-3 Hours	Timer	1	2	3
Water Pump 1-2-3 Starts	Timer	51	52	53
Well Pump 1-2 Hours	Timer	5	6	
Well Pump 1-2 Starts	Timer	55	56	
Air Compressor Hours	Timer	8		
Air Compressor Starts	Timer	58		

ALARM RECOVERY

Alarms are identified by L.E.D. indicators on the L2000 faceplate which require operator intervention for acknowledgement and / or clearing. This is done by pressing the ALARM ACK function keypad on the L2000 faceplate or pressing the PLC ALARM RESET Macro Key. Indicators for alarms already cleared will go off, including the Common Alarm.

The following alarms will automatically clear when the condition generating them no longer exists:

- System Pressure Xducr Fail ←
- System Pressure Low ←
- Hydro Tank Xducr Fail
- Hydro Tank Level High & Low
- Hydro Tank Pressure Xducr Fail
- Hydro Tank Pressure Low
- A/C Phase Fail
- 120 A/C Power Fail
- PLC D/C Power Fail

The following alarms require the PLC ALARM RESET Macro Key to be pressed before the condition is tested for clearing:

System Pressure High
Well Pump 1, 2 Start Fail & Overload
Water Pump 1, 2, 3 Start Fail & Overload
Air Compressor Start/Stop Fail & Overload

EXAMINING SYSTEM PARAMETERS:**TO DISPLAY REGISTERS:**

(ANALOG LEVELS IN (AI), ANALOG LEVELS OUT (AO), SETPOINTS (SP), etc..)

Using the 4-key keyboard

- * Keep pushing exit until the MODE is displayed
- * Press UP ARROW OR DOWN ARROW to view EXAMINE option
- * Press ENTER to lock in the EXAMINE option
- * Press UP ARROW OR DOWN ARROW to view desired Register Type
- * Press ENTER to lock in the desired Register Type
- * Press UP ARROW OR DOWN ARROW to view Register #
- * Press ENTER to display the Register Value

Using the 32-key keyboard

- * use the key sequence in front of the item to be displayed

NOTE: This can be done in RUN, STANDBY, or COMMAND MODE

ANALOG INPUTS:

EXAM LEVEL_IN 0 ENTER	System Pressure 0-100 psi
EXAM LEVEL_IN 1 ENTER	Hydro Tank Level 0-58 inches
EXAM LEVEL_IN 2 ENTER	Hydro Tank Pressure 0-100 psi

PUMP CONTROL SETPOINTS:

EXAM SETPOINT 41 ENTER	Lead water pump start psi
EXAM SETPOINT 42 ENTER	Lag water pump start psi
EXAM SETPOINT 43 ENTER	Lag1 water pump start psi
EXAM SETPOINT 47 ENTER	Air compressor start psi
EXAM SETPOINT 48 ENTER	Air cmpsr minimum start level in
EXAM SETPOINT 71 ENTER	Lead water pump stop psi
EXAM SETPOINT 72 ENTER	Lag water pump stop psi
EXAM SETPOINT 73 ENTER	Lag1 water pump stop psi
EXAM SETPOINT 77 ENTER	Air compressor stop psi
EXAM SETPOINT 100 ENTER	Lead water pump # / auto-alt #
EXAM SETPOINT 102 ENTER	Water pumps P1-2 run-time alt hrs

EXAMINING SYSTEM PARAMETERS (cont.):**PUMP DELAY SETPOINTS:**

EXAM SETPOINT 11	ENTER	Well pump call delay sec
EXAM SETPOINT 12	ENTER	Air compressor call delay sec
EXAM SETPOINT 20	ENTER	Water pump 1 start fail delay sec
EXAM SETPOINT 21	ENTER	Water pump 1 overload delay sec
EXAM SETPOINT 22	ENTER	Water pump 2 start fail delay sec
EXAM SETPOINT 23	ENTER	Water pump 2 overload delay sec
EXAM SETPOINT 26	ENTER	Well pump 1 start fail delay sec
EXAM SETPOINT 25	ENTER	Water pump 3 overload delay sec
EXAM SETPOINT 26	ENTER	Well pump 1 start fail delay sec
EXAM SETPOINT 27	ENTER	Well pump 1 overload delay sec
EXAM SETPOINT 28	ENTER	Well pump 2 start fail delay sec
EXAM SETPOINT 29	ENTER	Well pump 2 overload delay sec
EXAM SETPOINT 31	ENTER	Water pump re-start delay sec
EXAM SETPOINT 32	ENTER	Well pump re-start delay sec
EXAM SETPOINT 33	ENTER	Lead water pump start delay sec
EXAM SETPOINT 34	ENTER	Lead water pump stop delay sec
EXAM SETPOINT 35	ENTER	Lag water pump start delay sec
EXAM SETPOINT 36	ENTER	Lag water pump stop delay sec
EXAM SETPOINT 37	ENTER	Lag1 water pump start delay sec
EXAM SETPOINT 38	ENTER	Lag1 water pump stop delay sec
EXAM SETPOINT 39	ENTER	Pump sequential start delay sec

TRANSDUCER SETPOINTS:

EXAM SETPOINT 81	ENTER	System press xducr fail low psi
EXAM SETPOINT 82	ENTER	System pressure low psi
EXAM SETPOINT 83	ENTER	System pressure high psi
EXAM SETPOINT 84	ENTER	System press xducr fail high psi
EXAM SETPOINT 85	ENTER	Hydro tank level xducr fail low in
EXAM SETPOINT 86	ENTER	Hydro tank level low in
EXAM SETPOINT 87	ENTER	Hydro tank level high in
EXAM SETPOINT 88	ENTER	Hydro tank level xducr fail high in
EXAM SETPOINT 89	ENTER	Hydro tank press xducr fail low psi
EXAM SETPOINT 90	ENTER	Hydro tank pressure low psi
EXAM SETPOINT 91	ENTER	Hydro tank pressure high psi
EXAM SETPOINT 92	ENTER	Hydro tank press xducr fail high psi

ALARM DELAY SETPOINTS:

EXAM SETPOINT 1	ENTER	System press xducr fail delay sec
EXAM SETPOINT 2	ENTER	System pressure low delay sec
EXAM SETPOINT 3	ENTER	System pressure high delay sec
EXAM SETPOINT 5	ENTER	Hydro tank level xducr fail delay sec
EXAM SETPOINT 6	ENTER	Hydro tank low level delay sec
EXAM SETPOINT 7	ENTER	Hydro tank high level delay sec
EXAM SETPOINT 8	ENTER	Hydro press xducr fail delay sec
EXAM SETPOINT 9	ENTER	Hydro tank pressure low delay sec
EXAM SETPOINT 10	ENTER	Hydro tank pressure high delay sec
EXAM SETPOINT 15	ENTER	A/C phase fail delay sec
EXAM SETPOINT 16	ENTER	120 A/C power fail delay sec
EXAM SETPOINT 17	ENTER	PLC D/C power fail delay sec
EXAM SETPOINT 104	ENTER	Air cmpsr start fail delay sec
EXAM SETPOINT 105	ENTER	Air compressor overload delay sec
EXAM SETPOINT 106	ENTER	Air cmpsr stop fail delay sec

EXAMINING SYSTEM PARAMETERS (cont.):

RESERVED SETPOINTS:

EXAM SETPOINT 125 ENTER Program debug line number ###
EXAM SETPOINT 126 ENTER Quiescent telemetry control #

CHANGING SETPOINTS:

Using the 4-key keyboard:

- * Keep pushing exit until the MODE is displayed
- * Press UP ARROW OR DOWN ARROW to view CHANGE option
- * Press ENTER to lock in the CHANGE option
- * Press UP ARROW OR DOWN ARROW to view SETPOINT
- * Press ENTER to lock in the SETPOINT option
- * Press UP ARROW OR DOWN ARROW to view Register #
- * Press ENTER to display the Register Value
- * Press UP ARROW OR DOWN ARROW to increase or decrease the Setpoint Value
- * Press ENTER to change the Setpoint Value to the new value
- * Press EXIT EXIT to exit the command mode

Using the 32-key keyboard:

To change a setpoint, key in:

EXIT EXIT 10.2 ENTER :enter CMD mode
ACTION new value STORE SETPOINT sp# ENTER :store new value

For example, to store the value "10" into setpoint 1, key in:

ACTION 10.0 STORE SETPOINT 1 ENTER

To verify setpoint change, examine its value by keying in:

EXAM SETPOINT 1 ENTER (the display should read 10.00)

After changing desired setpoint(s), key in:

EXIT EXIT :exit CMD mode

NOTE: The above sequences can be done when the L2000 is in the RUN mode without stopping automatic operation.

sp#	VALUE	UNIT	FUNCTION
1	_____	sec	System press xducr fail delay
2	_____	sec	System pressure low delay
3	_____	sec	System pressure high delay
5	_____	sec	Hydro tank level xducr fail delay
6	_____	sec	Hydro tank low level delay
7	_____	sec	Hydro tank high level delay
8	_____	sec	Hydro press xducr fail delay
9	_____	sec	Hydro tank pressure low delay
10	_____	sec	Hydro tank pressure high delay
11	_____	sec	Well pump call delay
12	_____	sec	Air compressor call delay
15	_____	sec	A/C phase fail delay
16	_____	sec	120 A/C power fail delay
17	_____	sec	PLC D/C power fail delay
20	_____	sec	Water pump 1 start fail delay
21	_____	sec	Water pump 1 overload delay
22	_____	sec	Water pump 2 start fail delay
23	_____	sec	Water pump 2 overload delay
25	_____	sec	Water pump 3 overload delay
26	_____	sec	Well pump 1 start fail delay
27	_____	sec	Well pump 1 overload delay
28	_____	sec	Well pump 2 start fail delay
29	_____	sec	Well pump 2 overload delay

CHANGING SETPOINTS (cont.):

sp#	VALUE	UNIT	FUNCTION
31	_____	sec	Water pump re-start delay
32	_____	sec	Well pump re-start delay
33	_____	sec	Lead water pump start delay
34	_____	sec	Lead water pump stop delay
35	_____	sec	Lag water pump start delay
36	_____	sec	Lag water pump stop delay
37	_____	sec	Lag1 water pump start delay
38	_____	sec	Lag1 water pump stop delay
39	_____	sec	Pump sequential start delay
41	_____	psi	Lead water pump start
42	_____	psi	Lag water pump start
43	_____	psi	Lag1 water pump start
47	<u>45</u>	psi	Air compressor start
48	<u>30</u>	in	Air cmpsr minimum start level
71	_____	psi	Lead water pump stop
72	_____	psi	Lag water pump stop
73	_____	psi	Lag1 water pump stop
77	<u>55</u>	psi	Air compressor stop
81	_____	psi	System press xducr fail low
82	_____	psi	System pressure low
83	_____	psi	System pressure high
84	_____	psi	System press xducr fail high
85	_____	in	Hydro tank level xducr fail low
86	_____	in	Hydro tank level low
87	_____	in	Hydro tank level high
88	_____	in	Hydro tank level xducr fail high
89	_____	psi	Hydro tank press xducr fail low
90	_____	psi	Hydro tank pressure low
91	_____	psi	Hydro tank pressure high
92	_____	psi	Hydro tank press xducr fail high
100	_____	#	Lead water pump # / auto-alt
102	_____	hrs	Water pumps P1-2 run-time alt
104	_____	sec	Air cmpsr start fail delay
105	_____	sec	Air compressor overload delay
106	_____	sec	Air cmpsr stop fail delay
125	_____	###	Program debug line number
126	_____	#	Quiescent telemetry control

NOTE: RECORD ALL SETPOINT CHANGES FOR FUTURE REFERENCE.

SUMMARY LISTING (DIGITAL I/O) SITEGLAS SYSTEM ADDRESS 01:

--- PHYSICAL DIGITAL OUTPUTS ---

P0-Common Alarm
 P1-Water Pump 1 Call
 P2-Water Pump 2 Call
 P3-Water Pump 3 Call
 P4-Well Pump 1 Call
 P5-Well Pump 2 Call

--- PHYSICAL DIGITAL INPUTS ---

S0-Water Pump 1 in Auto
 S1-Water Pump 1 Running
 S2-Water Pump 1 Overload
 S3-
 S4-Water Pump 2 in Auto
 S5-Water Pump 2 Running
 S6-Water Pump 2 Overload
 S7-
 S8-Water Pump 3 in Auto
 S9-Water Pump 3 Running
 S10-Water Pump 3 Overload

--- INTERNAL DIGITAL INPUTS ---

S64-
 S65-
 |
 S69-
 S70-Water Pump 1 Start Fail Alarm
 S71-Water Pump 1 Overload Alarm
 S72-Water Pump 2 Start Fail Alarm
 S73-Water Pump 2 Overload Alarm
 S74-Water Pump 3 Start Fail Alarm
 S75-Water Pump 3 Overload Alarm
 S76-Well Pump 1 Start Fail Alarm
 S77-Well Pump 1 Overload Alarm
 S78-Well Pump 2 Start Fail Alarm
 S79-Well Pump 2 Overload Alarm
 S80-A/C Power Interlock Flag
 S81-System Press Xducr Fail Alarm
 S82-System Pressure Low Alarm
 S83-System Pressure High Alarm
 S84-
 S85-Hydro Level Xducr Fail Alarm
 S86-Hydro Tank Low Level Alarm
 S87-Hydro Tank High Level Alarm
 S88-Hydro Press Xducr Fail Alarm
 S89-Hydro Tank Pressure Low Alarm
 S90-Hydro Tank Pressure High Alarm
 S91-Well Pump Call Flag
 S92-Air Compressor Call Flag
 S93-
 S94-
 S95-A/C Phase Fail Alarm

--- PHYSICAL DIGITAL OUTPUTS ---

P6-Air Compressor Call
 P7-
 P8-
 P9-
 P10-
 P11-

--- PHYSICAL DIGITAL INPUTS ---

S11-
 S12-Well Pump 1 in Auto
 S13-Well Pump 1 Running
 S14-Well Pump 1 Overload
 S15-
 S16-Well Pump 2 in Auto
 S17-Well Pump 2 Running
 S18-Well Pump 2 Overload
 S19-
 S20-Air Compressor in Auto
 S21-Air Compressor Running

--- INTERNAL DIGITAL INPUTS ---

S96-120 A/C Power Fail Alarm
 S97-PLC D/C Power Fail Alarm
 S98-
 S99-
 S100-SCADA Alarm Ack / Reset
 S101-
 S102-
 S103-
 S104-Air Cmpsr Start/Stop Fail Alarm
 S105-Air Compressor Overload Alarm
 S106-
 |
 S119-
 S120-
 S121-Water Pump 1 Available Flag
 S122-Water Pump 2 Available Flag
 S123-Water Pump 3 Available Flag
 S124-
 S125-Well Pump 1 Available Flag
 S126-Well Pump 2 Available Flag
 S127-
 S128-Air Compressor Available Flag
 S129-
 S130-
 S131-Lead Water Pump Required
 S132-Lag Water Pump
 S133-Lag1 Water Pump
 S134-
 S135-Lead Well Pump Required
 S136-Lag Well Pump (off)

--- PHYSICAL DIGITAL OUTPUTS ---

P12-
 P13-
 P14-
 P15-

--- PHYSICAL DIGITAL INPUTS ---

S22-Air Compressor Overload
 S23-Well Pump 1 Selected
 S24-Well Pump 2 Selected
 S25-Well Pump Call Switch
 S26-
 S27-
 S28-
 S29-A/C Phase Fail
 S30-120 A/C Power Fail
 S31-PLC D/C Power Fail

--- INTERNAL DIGITAL INPUTS ---

S137-
 S138-
 S139-
 S140-
 S141-Water Pump 1 Call (L2000)
 S142-Water Pump 2 Call
 S143-Water Pump 3 Call
 S144-
 S145-Well Pump 1 Call (L2000)
 S146-Well Pump 2 Call
 S147-
 |
 S158-
 S159-
 S160-L2000 Alarm Acknowledge D.I.
 S161-L2000 Security Threat D.I.
 S162-L2000 O/I Alarm Ack Key D.I.
 S163-L2000 Comm Fail D.I.
 S164-L2000 Program Trace 1 D.I./I.R.
 S165-L2000 Program Trace 2 D.I.
 S166-L2000 Power Fail D.I.
 S167-L2000 Software Int. Enable D.I.
 S168-L2000 Run Mode D.I.
 S169-L2000 Alarm Reset D.I.(macro)
 S170-L2000 Card Health D.I.
 S171-
 S172-L2000 Comm 2 Disable D.I.
 S173-L2000 Comm 3 Disable D.I.

SUMMARY LISTING (ANALOG I/O) SITEGLAS SYSTEM ADDRESS 01:

--- PHYSICAL ANALOG INPUTS ---
 L0-System Pressure 0-100 psi
 L1-Hydro Tank Level 0-58 inches
 L2-Hydro Tank Pressure 0-100 psi
 L3-
 L4-
 L5-

--- PHYSICAL ANALOG OUTPUTS ---
 A00-
 A01-

--- INTERNAL ANALOG OUTPUTS ---
 A04-
 A05-
 A06-Water pump start psi reg.
 A07-Water pump stop psi reg.
 A08-Water pump start delay reg.
 A09-Water pump stop delay reg.
 A010-System pressure control reg.
 A011-Hydro tank level control reg.
 A012-Hydro tank press control reg.
 A013-
 |
 A023-
 A024-PLC time of day set
 A025-PLC time of day (hh.mm)
 A026-
 A027-
 |
 A089-

--- PHYSICAL ANALOG INPUTS ---
 L6-
 L7-
 L8-
 L9-
 L10-
 L11-

--- PHYSICAL ANALOG OUTPUTS ---
 A02-
 A03-

--- INTERNAL ANALOG OUTPUTS ---
 A090-L2000 RTC hour format
 A091-L2000 comm fail address
 A092-L2000 network comm fail
 A093-RTC day of week (1-7)
 A094-RTC day of month (1-31)
 A095-RTC month of year (1-12)
 A096-RTC year
 A097-L2000 power fail count
 A098-L2000 reset count
 A099-L2000 random # generator
 A0100-L2000 network address
 A0101-L2000 card count
 A0102-
 |
 A0126-
 A0127-

SUMMARY LISTING (TIMERS) SITEGLAS SYSTEM ADDRESS 01:

----- HOUR TIMERS -----		SETPOINTS	----- HOUR TIMERS -----		SETPOINTS
T0-			T28-Water pumps start delay	SP33	sec
T1-Water pump 1 hours			T29-Water pumps stop delay	SP34	sec
T2-Water pump 2 hours			T30-		
T3-Water pump 3 hours			T31-Water pump 1 re-start delay	SP31	sec
T4-			T32-Water pump 2 re-start delay	SP31	sec
T5-Well pump 1 hours			T33-Water pump 3 re-start delay	SP31	sec
T6-Well pump 2 hours			T34-		
T7-			T35-Well pump 1 re-start delay	SP32	sec
T8-Air compressor hours			T36-Well pump 2 re-start delay	SP32	sec
T9-			T37-		
T10-L2000 hours			T38-		
T11-			T39-		
T12-Water pumps P1-2 run-time alt	SP102	hrs			
T13-					
T27-					
----- HMS TIMERS -----					
T40-Real Time Clock					
----- INCREMENT COUNTERS -----					
T50-A/C phase fail count			T60-Water pump call seq / alt		
T51-Water pump 1 starts / intlk			T61-# water pumps running		
T52-Water pump 2 starts / intlk			T62-# water pumps available		
T53-Water pump 3 starts / intlk			T63-		
T54-			T64-Water pump call sequencer		
T55-Well pump 1 starts / intlk			T65-Well pump call seq. (1-2)		
T56-Well pump 2 starts / intlk			T66-		
T57-			T67-		
T58-Air compressor starts			T68-		
T59-			T69-		
----- SECONDS TIMERS -----					
T70-Water pump 1 start fail delay	SP20	sec	T89-Hydro tank pressure low delay	SP9	sec
T71-Water pump 1 overload delay	SP21	sec	T90-Hydro tank pressure high delay	SP10	sec
T72-Water pump 2 start fail delay	SP22	sec	T91-Well pump call delay	SP11	sec
T73-Water pump 2 overload delay	SP23	sec	T92-Air compressor call delay	SP12	sec
T74-Water pump 3 start fail delay	SP26	sec	T93-		
T75-Water pump 3 overload delay	SP25	sec	T94-		
T76-Well pump 1 start fail delay	SP26	sec	T95-A/C phase fail delay	SP15	sec
T77-Well pump 1 overload delay	SP27	sec	T96-120 A/C power fail delay	SP16	sec
T78-Well pump 2 start fail delay	SP28	sec	T97-PLC D/C power fail delay	SP17	sec
T79-Well pump 2 overload delay	SP29	sec	T98-		
T80-Pump sequential start delay	SP39	sec	T99-		
T81-System press xducr fail delay	SP1	sec	T100-L2000 re-start delay (5 sec)		
T82-System pressure low delay	SP2	sec	T101-		
T83-System pressure high delay	SP3	sec	T102-		
T84-			T103-		
T85-Hydro tank level xducr fail delay	SP5	sec	T104-Air cmpsr start fail delay	SP104	sec
T86-Hydro tank low level delay	SP6	sec	T105-Air compressor overload delay	SP105	sec
T87-Hydro tank high level delay	SP7	sec	T106-Air cmpsr stop fail delay	SP106	sec
T88-Hydro press xducr fail delay	SP8	sec			

: OXNARD SCHOOL DISTRICT Rio Mesa High School P/S T34350

: ----- INITIALIZATION -----

00- ACTION 0.0 STORE T100 AND T100 ON :re-start delay
 AND 34350 - 2.0 STORE AO99 AND T10 ON :..rev.#/L2000 hrs

: ----- COMM PORTS / TIMERS -----

: - note: hour=0-39 / hms=40-49 / incr=50-69 / sec=70-119
 02- ACTION S172 OFF AND S173 OFF :comm 2-3 enable=off
 AND T31 ON AND T32 ON AND T33 ON :pump delays
 AND T34 OFF AND T35 ON AND T36 ON
 AND T70 ON AND T71 ON AND T72 ON :pump & station
 AND T73 ON AND T74 ON AND T75 ON :..alarm delays
 AND T76 ON AND T77 ON AND T78 ON
 AND T79 ON
 AND T81 ON AND T82 ON AND T83 ON
 AND T85 ON AND T86 ON AND T87 ON
 AND T88 ON AND T89 ON AND T90 ON
 AND T91 ON AND T92 ON AND T93 ON
 AND T94 ON AND T95 ON AND T96 ON
 AND T97 ON AND T98 OFF AND T99 OFF
 AND T104 ON AND T105 ON AND T106 ON :cmpsr alarms

03- 5.00 < T100 ACTION T100 OFF :re-start done
 04- SP39 < T80 ACTION T80 OFF :pump seq. start
 AND 0.0 STORE T80 :..done & reset

: ----- ALARM ACK / RESET -----

05- S160 ON :ALARM ACK D.I.
 ACTION S160 OFF AND S100 OFF :..reset / macro off
 AND S169 OFF :..
 AND SP3 MAX 1 < T83 STORE S83 :..& press high
 06- S169 ON :RESET_MACRO
 ACTION S160 ON :..ACK D.I. ON
 07- S100 ON ACTION S160 ON :SCADA Alarm Ack

: ----- POWER FAIL ALARMS / STATUS -----

10- S29 OFF :A/C phase_ok
 ACTION 0.0 STORE T95 AND S95 OFF :..reset
 ELSE SP15 < T95 AND S95 OFF :alarm
 ACTION S95 ON AND T50 INCR :..& count
 11- S30 OFF :120 A/C power_ok
 ACTION 0.0 STORE T96 AND S96 OFF :..reset
 ELSE SP16 < T96 ACTION S96 ON :alarm
 12- S31 OFF :PLC D/C power_ok
 ACTION 0.0 STORE T97 AND S97 OFF :..reset
 ELSE SP17 < T97 ACTION S97 ON :alarm
 13- S29 ON ACTION S80 ON :a/c phase fail
 ELSE ACTION S80 OFF :..intlk. on/off
 14- S80 ON :power interlock on
 OR T100 ON :..re-start
 ACTION 0.0 STORE T80 AND T80 ON :..seq. delay on

: ----- STATION ALARMS / STATUS -----

: - note: d.i.# 26-27-28 not used (hydrolevel deleted)
 20- S25 OFF :Well pump call

```

ACTION 0.0 STORE T91 AND S91 OFF :..reset
ELSE SP11 < T91 ACTION S91 ON :FLAG on / off

22- S26 OFF :Hydro tank high_ok
OR SP13 < 1 :..SP disabled
ACTION 0.0 STORE T93 AND S93 OFF :..reset
ELSE SP13 < T93 ACTION S93 ON :alarm

23- S28 OFF :Hydro tank low_ok
OR SP14 < 1 :..SP disabled
ACTION 0.0 STORE T94 AND S94 OFF :..reset
ELSE SP14 < T94 ACTION S94 ON :alarm
    
```

: ----- WATER PUMP FAIL ALARMS -----

: - note: d.i.# 3-7-11-15-19 not used (valve limit switches deleted)

```

30- T1 ON :P1_run
OR P1 OFF :..not called
OR SP20 < 1 :..SP disabled
ACTION 0.0 STORE T70 :..reset
ELSE SP20 < T70 ACTION S70 ON :alarm

31- S2 OFF :P1 overload_ok
OR SP21 < 1 :..SP disabled
ACTION 0.0 STORE T71 :..reset
ELSE SP21 < T71 ACTION S71 ON :alarm

32- S0 OFF :..non-auto / RESET
OR S169 ON :clear start fail
ACTION S70 OFF :..& overload
AND SP21 MAX 1 < T71 STORE S71

34- T2 ON :P2_run
OR P2 OFF :..not called
OR SP22 < 1 :..SP disabled
ACTION 0.0 STORE T72 :..reset
ELSE SP22 < T72 ACTION S72 ON :alarm

35- S6 OFF :P2 overload_ok
OR SP23 < 1 :..SP disabled
ACTION 0.0 STORE T73 :..reset
ELSE SP23 < T73 ACTION S73 ON :alarm

36- S4 OFF :..non-auto / RESET
OR S169 ON :clear start fail
ACTION S72 OFF :..& overload
AND SP23 MAX 1 < T73 STORE S73

38- T3 ON :P3_run
OR P3 OFF :..not called
OR SP24 < 1 :..SP disabled
ACTION 0.0 STORE T74 :..reset
ELSE SP24 < T74 ACTION S74 ON :alarm

39- S10 OFF :P3 overload_ok
OR SP25 < 1 :..SP disabled
ACTION 0.0 STORE T75 :..reset
ELSE SP25 < T75 ACTION S75 ON :alarm

40- S8 OFF :..non-auto / RESET
OR S169 ON :clear start fail
ACTION S74 OFF :..& overload
AND SP25 MAX 1 < T75 STORE S75
    
```

: ----- WELL PUMP FAIL ALARMS -----

```

42- T5 ON :P1_run
OR P4 OFF :..not called
OR SP26 < 1 :..SP disabled
    
```

```

ACTION 0.0 STORE T76 :..reset
ELSE SP26 < T76 ACTION S76 ON :alarm
43- S14 OFF :P1 overload_ok
OR SP27 < 1 :..SP disabled
ACTION 0.0 STORE T77 :..reset
ELSE SP27 < T77 ACTION S77 ON :alarm
44- S12 OFF :..non-auto / RESET
OR S169 ON :clear start fail
ACTION S76 OFF :..& overload
AND SP27 MAX 1 < T77 STORE S77

46- T6 ON :P2_run
OR P5 OFF :..not called
OR SP28 < 1 :..SP disabled
ACTION 0.0 STORE T78 :..reset
ELSE SP28 < T78 ACTION S78 ON :alarm
47- S18 OFF :P2 overload_ok
OR SP29 < 1 :..SP disabled
ACTION 0.0 STORE T79 :..reset
ELSE SP29 < T79 ACTION S79 ON :alarm
48- S16 OFF :..non-auto / RESET
OR S169 ON :clear start fail
ACTION S78 OFF :..& overload
AND SP29 MAX 1 < T79 STORE S79

```

: ----- AIR COMPRESSOR FAIL ALARMS -----

```

50- T8 ON :Cmps_running
OR P6 OFF :..not called
OR SP104 < 1 :..SP disabled
ACTION 0.0 STORE T104 :..reset
ELSE SP104 < T104 ACTION S104 ON :alarm
51- S22 OFF :Cmps overload_ok
OR SP105 < 1 :..SP disabled
ACTION 0.0 STORE T105 :..reset
ELSE SP105 < T105 ACTION S105 ON :alarm
52- S20 OFF :..non-auto / RESET
OR S169 ON :clear start fail
ACTION S104 OFF :..& overload
AND SP105 MAX 1 < T105 STORE S105

53- P6 OFF OR S104 ON :Cmps off, fail
ACTION 0.0 STORE T106 :..reset
AND SP106 < T106 ACTION S104 ON :stop fail alarm

```

: ----- SYSTEM PRESSURE / XDUCR ALARMS -----

```

60- L0 > SP81 AND L0 < SP84 :xducr ok
ACTION 0.0 STORE T81 AND S81 OFF :..reset
ELSE SP1 < T81 ACTION S81 ON :XDUCR fail
61- L0 > 0.0 :A.I. > zero
AND S81 OFF :..& xducr ok
ACTION L0 STORE AO10 :..control reg.
ELSE ACTION 0.0 STORE AO10 :zero |

62- AO10 > SP82 :not LOW
ACTION 0.0 STORE T82 AND S82 OFF :..reset
ELSE SP2 < T82 ACTION S82 ON :alarm

63- AO10 < SP83 :not HIGH
ACTION 0.0 STORE T83 AND S83 OFF :..reset
ELSE SP3 < T83 ACTION S83 ON :alarm

```

```

: ----- HYDRO TANK LEVEL -----
70- L1 > SP85 AND L1 < SP88 :xducr ok
      ACTION 0.0 STORE T85 AND S85 OFF :..reset
      ELSE SP5 < T85 ACTION S85 ON :XDUCR fail
71- L1 > 0.0 :A.I. > zero
      AND S85 OFF :..& xducr ok
      ACTION L1 STORE AO11 :..control reg.
      ELSE ACTION 0.0 STORE AO11 :zero |

72- AO11 > SP86 :not LOW
      ACTION 0.0 STORE T86 AND S86 OFF :..reset
      ELSE SP6 < T86 ACTION S86 ON :alarm

73- AO11 < SP87 :not HIGH
      ACTION 0.0 STORE T87 AND S87 OFF :..reset
      ELSE SP7 < T87 ACTION S87 ON :alarm

: ----- HYDRO TANK PRESSURE -----
75- L2 > SP89 AND L2 < SP92 :xducr ok
      ACTION 0.0 STORE T88 AND S88 OFF :..reset
      ELSE SP8 < T88 ACTION S88 ON :XDUCR fail
76- L2 > 0.0 :A.I. > zero
      AND S88 OFF :..& xducr ok
      ACTION L2 STORE AO12 :..control reg.
      ELSE ACTION 0.0 STORE AO12 :zero |

77- AO12 > SP90 :not LOW
      ACTION 0.0 STORE T89 AND S89 OFF :..reset
      ELSE SP9 < T89 ACTION S89 ON :alarm

78- AO12 < SP91 :not HIGH
      ACTION 0.0 STORE T90 AND S90 OFF :..reset
      ELSE SP10 < T90 ACTION S90 ON :alarm

: ----- AIR COMPRESSOR AVAILABLE / CALL -----
: - note: cmprsr call-> system psi
80- S20 ON :Air cmprsr_auto
      AND S104 OFF AND S105 OFF :..fail alarm(s) ok
      ACTION S128 ON :status on
      ELSE ACTION S128 OFF :..n/a

81- AO12 > SP77 :Press > SP
      OR AO11 < SP48 :..Level < SP
      OR T61 > 1 :..pump(s) on
      OR S81 ON :..xducr fail
      ACTION 0.0 STORE T92 AND S92 OFF :..Flag off
82- AO12 > SP47 :Press > SP
      ACTION 0.0 STORE T92 :..reset
      ELSE SP12 < T92 ACTION S92 ON :FLAG on

83- S92 OFF :Air flag off
      OR S128 OFF :..compressor n/a
      OR S80 ON :..power intlk.
      OR S96 ON :..a/c power fail
      ACTION P6 OFF AND GOTO 85 :STOP & skip
84- S92 ON :Air flag on
      ACTION P6 ON :..START_

```

```

: ----- WELL PUMP CALL SEQ / CALLS / BACKUP -----
: - note: lead call-> d.i.(s25) / lag always off
85- S23  ON  ACTION 1.0  STORE T65      :P1 lead
      ELSE ACTION 2.0  STORE T65      :P2 lead

86- ACTION S91  STORE S135             :call flag = lead
      AND S136 OFF                     :... OFF = lag

87- T65  < 2  AND S125 ON              :P1 lead & ok
      OR S126 OFF                      :...or P2 n/a
      ACTION S135 STORE S145           :P1 = lead call
      AND S136 STORE S146 AND GOTO 90 :P2 = lag
88- ACTION S135 STORE S146           :P2 = lead call
      AND S136 STORE S145           :P1 = lag

: ----- WATER PUMP CALL PARAMETERS -----
90- T64  < 1
      ACTION SP41 STORE AO6  AND SP33 STORE AO8 :stage #0 psi-delay
      AND SP71 STORE AO7  AND SP34 STORE AO9 :...lead start
89- T64  EQ 1
      ACTION SP42 STORE AO6  AND SP35 STORE AO8 :...lead stop (n/a)
      AND SP71 STORE AO7  AND SP34 STORE AO9 :stage #1
91- T64  EQ 2
      ACTION SP43 STORE AO6  AND SP37 STORE AO8 :...lag start
      AND SP72 STORE AO7  AND SP36 STORE AO9 :...lead stop
92- T64  EQ 2
      ACTION SP43 STORE AO6  AND SP37 STORE AO8 :stage #2
      AND SP72 STORE AO7  AND SP36 STORE AO9 :...lag1 start
93- T64  > 3
      ACTION SP43 STORE AO6  AND SP37 STORE AO8 :...lag stop
      AND SP73 STORE AO7  AND SP38 STORE AO9 :...lag1 stop

: ----- WATER PUMP CALL SEQ / ALTERNATE -----
: - notes: setpt mode-> fixed lead-lag / lag1 = P3
:         P1-2 run-time alt-> lead on for sp102 hours
95- SP100 > 1  AND SP100 < 2.5        :P1-2 setpt control
      ACTION SP100 STORE T60          :...save lead #
      AND T60  OFF                    :...auto-alt. off
      ELSE T64  > 1                    :lead call on
      AND T61  > 1                    :...pump(s) on
      ACTION T60  ON                   :auto-alt. flag
96- T60  ON                             :alt. flag on
      AND S121 ON  AND S122 ON         :...2 available
      AND T64  < 1                    :...calls off
      AND T61  < 1                    :...pumps off
      ACTION T60  OFF AND T60  INCR    :...alternate
      AND 0.0  STORE T12              :...reset run-time

97- T60  ON                             :alt. flag on
      AND T64  EQ 1                    :...lead pump call
      AND T61  > 1                    :...pump(s) on
      AND SP102 > 1                    :...SP enabled
      ACTION T12  ON                   :run-timer on
      ELSE ACTION 0.0  STORE T12      :...or reset
      AND T12  OFF AND GOTO 99        :...& skip
98- SP102 < T12                          :run-time done
      AND S121 ON  AND S122 ON         :...2 available
      ACTION T60  OFF AND T60  INCR    :...alternate
      AND 0.0  STORE T12              :...reset run-time

99- T60  < 1  OR T60  > 3              :adj. for # pumps

```

ACTION 1.0 STORE T60 :..

: ----- WATER PUMP CALL SEQUENCER -----

: - note: call-> lead=sys press, lag=sys press, lag1=sys press
 100- ACTION T28 ON AND T29 ON :call timers on
 AND S1 + S5 + S9 STORE T61 :..# pumps running
 AND S121 + S122 + S123 STORE T62 :..# P1-3 pumps avail

101- S80 ON :power intlk.
 OR S81 ON OR S83 ON :..s-psi xdcr fail/hi
 OR S85 ON OR S87 ON :..h-lvl xdcr fail/hi
 OR S88 ON OR S90 ON :..h-psi xdcr fail/hi
 OR T62 < 1 :..0 pumps avail
 OR T100 ON :..re-start
 ACTION 0.0 STORE T64 :stage #0
 AND 0.0 STORE T28 :..reset delays
 AND 0.0 STORE T29 AND GOTO 104 :..& skip

102- AO10 > AO6 :Press > start SP
 ACTION 0.0 STORE T28 :..reset
 ELSE AO8 / 3600.0 < T28 ACTION T64 INCR :step UP

103- AO10 < AO7 :Press < stop SP
 OR T64 < 1 :..stage #0
 ACTION 0.0 STORE T29 :..reset
 ELSE AO9 / 3600.0 < T29 ACTION T64 DECR :step DOWN

104- T64 < 1 ACTION 0.0 STORE T64 ELSE :min # = 0
 T64 > 4 ACTION 3.0 STORE T64 :..limit stage# 3

105- T64 NEQ IR64 :stage # change
 OR T61 NEQ INDEX 61 :..# pump on |
 ACTION T61 STORE INDEX 61 :..up-date
 AND T64 STORE INDEX 64 :..
 AND 0.0 STORE T28 :..reset delays
 AND 0.0 STORE T29 :..

: ----- WATER PUMPS REQUIRED to CALLS / BACKUP -----

106- ACTION T64 > 1 STORE S131 :stage #1 = lead
 AND T64 > 2 STORE S132 :.. #2 = lag
 AND T64 > 3 STORE S133 :.. #3 = lag1

107- T60 < 2 AND S121 ON :P1 lead & ok
 OR S122 OFF :..or P2 n/a
 ACTION S131 STORE S141 :P1 = lead call
 AND S132 STORE S142 :P2 = lag
 AND S133 STORE S143 AND GOTO 110 :P3 = lag1

108- ACTION S131 STORE S142 :P2 = lead call
 AND S132 STORE S141 :P1 = lag
 AND S133 STORE S143 :P3 = lag1

: ----- WATER PUMPS AVAILABLE / INTERLOCKS -----

110- S0 ON :Water P1_auto
 AND S70 OFF AND S71 OFF :..fail alarm(s) ok
 ACTION S121 ON :status on
 ELSE ACTION S121 OFF AND S141 OFF :..n/a & call off
 111- S4 ON :Water P2_auto
 AND S72 OFF AND S73 OFF :..

```

                ACTION S122 ON                :..
112- S8  ELSE ACTION S122 OFF AND S142 OFF   :..
                ON                          :Water P3_auto
                AND S74 OFF AND S75 OFF     :..
                ACTION S123 ON              :..
                ELSE ACTION S123 OFF AND S143 OFF :..

114- S81 ON      OR S83 ON                  :PSI xducr/high
                ACTION T51 ON               :..pump 1-2-3
                AND T52 ON AND T53 ON       :..interlock on
                ELSE ACTION T51 OFF          :ok, all off
                AND T52 OFF AND T53 OFF     :..
    
```

: ----- WELL PUMPS AVAILABLE / INTERLOCKS -----

```

115- S12 ON                :Well P1_auto
                AND S76 OFF AND S77 OFF    :..fail alarm(s) ok
                ACTION S125 ON             :status on
                ELSE ACTION S125 OFF AND S145 OFF :..n/a & call off
116- S16 ON                :Well P2_auto
                AND S78 OFF AND S79 OFF    :..
                ACTION S126 ON             :..
                ELSE ACTION S126 OFF AND S146 OFF :..

118- S95 ON                :a/c phase fail
                ACTION T55 ON AND T56 ON   :..pump 1-2
                ELSE ACTION T55 OFF AND T56 OFF :..interlock on/off
    
```

: ----- WATER PUMP 1 STOP / START -----

```

120- S141 OFF              :called off
                OR S80 ON                  :..power intlk.
                OR S121 OFF                :..not available
                OR T51 ON                  :..station intlk.
                ACTION P1 OFF AND GOTO 122 :STOP_& skip
121- S141 ON                :called on
                AND P1 OFF                  :..not called
                AND SP31 / 3600.0 < T31   :..backspin
                AND T80 OFF                :..seq. start ok
                ACTION P1 ON AND T80 ON    :START_& delay
                AND 0.0 STORE T31         :..backspin
    
```

: ----- WATER PUMP 2 STOP / START -----

```

122- S142 OFF              :called off
                OR S80 ON                  :..power intlk.
                OR S122 OFF                :..not available
                OR T52 ON                  :..station intlk.
                ACTION P2 OFF AND GOTO 124 :STOP_& skip
123- S142 ON                :called on
                AND P2 OFF                  :..not called
                AND SP31 / 3600.0 < T32   :..backspin
                AND T80 OFF                :..seq. start ok
                ACTION P2 ON AND T80 ON    :START_& delay
                AND 0.0 STORE T32         :..backspin
    
```

: ----- WATER PUMP 3 STOP / START -----

```

124- S143 OFF              :called off
                OR S80 ON                  :..power intlk.
                OR S123 OFF                :..not available
                OR T53 ON                  :..station intlk.
    
```

```

ACTION P3 OFF AND GOTO 126 :STOP_ & skip
125- S143 ON :called_ on
AND P3 OFF :..not called
AND SP31 / 3600.0 < T33 :..backspin
AND T80 OFF :..seq. start ok
ACTION P3 ON AND T80 ON :START_ & delay
AND 0.0 STORE T33 :..backspin

: ----- WELL PUMP 1 STOP / START -----
126- S145 OFF :called off
OR S80 ON :..power intlk.
OR S125 OFF :..not available
OR T55 ON :..station intlk.
ACTION P4 OFF AND GOTO 128 :STOP_ & skip
127- S145 ON :called_ on
AND P4 OFF :..not called
AND SP32 / 3600.0 < T35 :..backspin
AND T80 OFF :..seq. start ok
ACTION P4 ON AND T80 ON :START_ & delay
AND 0.0 STORE T35 :..backspin

: ----- WELL PUMP 2 STOP / START -----
128- S146 OFF :called off
OR S80 ON :..power intlk.
OR S126 OFF :..not available
OR T56 ON :..station intlk.
ACTION P5 OFF AND GOTO 130 :STOP_ & skip
129- S146 ON :called_ on
AND P5 OFF :..not called
AND SP32 / 3600.0 < T36 :..backspin
AND T80 OFF :..seq. start ok
ACTION P5 ON AND T80 ON :START_ & delay
AND 0.0 STORE T36 :..backspin

: ----- PUMP RUNTIME / BACKSPIN / # STARTS -----
130- S1 ON ACTION T1 ON :Water P1_hours
AND 0.0 STORE T31 :..backspin
131- S1 OFF AND T1 ON ACTION T1 OFF :..starts
AND T51 INCR :..
132- S5 ON ACTION T2 ON :Water P2_hours
AND 0.0 STORE T32 :..backspin
133- S5 OFF AND T2 ON ACTION T2 OFF :..starts
AND T52 INCR :..
134- S9 ON ACTION T3 ON :Water P3_hours
AND 0.0 STORE T33 :..backspin
135- S9 OFF AND T3 ON ACTION T3 OFF :..starts
AND T53 INCR :..
136- S13 ON ACTION T5 ON :Well P1_hours
AND 0.0 STORE T35 :..backspin
137- S13 OFF AND T5 ON ACTION T5 OFF :..starts
AND T55 INCR :..
138- S17 ON ACTION T6 ON :Well P2_hours
AND 0.0 STORE T36 :..backspin
139- S17 OFF AND T6 ON ACTION T6 OFF :..starts
    
```



```

                                AND T56  INCR          ...
140- S21 ON                      ACTION T8  ON          :Air cmpsr_hours
141- S21 OFF AND T8  ON  ACTION T8  OFF          :...starts
                                AND T58  INCR          ...

: ----- T-O-D SYNC / RTU INFO / DISPLAY -----
: - note: PLC time = AO25 / set time (hh.mm) via AO24
:       index reg. 90-94 used for rtu info / 81-84 used for macros
146- AO24 > .01 AND AO24 < 24.0          :valid T-O-D
      ACTION AO24 STORE INDEX 92          :...save hours
      AND ( AO24 - IR92 * 100 )          :...& minutes
      + 0.5 STORE INDEX 93          :...calc # of
      AND ( IR92 * 7200 )          :...seconds
      + ( IR93 * 120 ) STORE T40          :set R-T-C
      AND 0.0 STORE AO24          :...& reset time reg.
147- ACTION AO90 STORE INDEX 90          :convert t-o-d
      AND AO90 - IR90 * 60.0 STORE INDEX 91 :...in AO24
      AND IR91 / 100.0 + IR90 STORE AO25 :...time = hh.mm

150- ACTION GOTO 02          :re-enter loop
END of Program ::::::::::::::::::::::::::::::::::::::::::::
:rev.1 -> added: hydro tank level xducr / deleted tank & valve d.i.'s
:       changed: water pump calls from psi to level
:rev.2 -> added: hydro tank press xducr / air cmpsr stop fail(sp106)
:       changed: water pump calls from level back to system psi

```

Cross Reference for TESCODE Program <C:\TJOBS2\T34350\A01.SRC>
 Created on Mon Aug 27 13:43:55 2007

Analog Inputs:

L0 :	60	61
L1 :	70	71
L2 :	75	76

Analog Outputs:

AO6 :	90	91	92	93	102
AO7 :	90	91	92	93	103
AO8 :	90	91	92	93	102
AO9 :	90	91	92	93	103
AO10 :	61	62	63	102	103
AO11 :	71	72	73	81	
AO12 :	76	77	78	81	82
AO24 :	146				
AO25 :	147				
AO90 :	147				
AO99 :	0				

Setpoints:

SP1 :	60	
SP2 :	62	
SP3 :	5	63
SP5 :	70	
SP6 :	72	
SP7 :	73	
SP8 :	75	81
SP9 :	77	
SP10 :	78	
SP11 :	20	
SP12 :	82	
SP13 :	22	
SP14 :	23	
SP15 :	10	
SP16 :	11	
SP17 :	12	
SP20 :	30	
SP21 :	31	32
SP22 :	34	
SP23 :	35	36
SP24 :	38	
SP25 :	39	40
SP26 :	42	
SP27 :	43	44
SP28 :	46	

SP29 :	47	48	
SP31 :	121	123	125
SP32 :	127	129	
SP33 :	90		
SP34 :	90	91	
SP35 :	91		
SP36 :	92		
SP37 :	92	93	
SP38 :	93		
SP39 :	4		
SP41 :	90		
SP42 :	91		
SP43 :	92	93	
SP47 :	82		
SP71 :	90	91	
SP72 :	92		
SP73 :	93		
SP77 :	81		
SP81 :	60		
SP82 :	62		
SP83 :	63		
SP84 :	60		
SP85 :	70		
SP86 :	72		
SP87 :	73		
SP88 :	70		
SP89 :	75		
SP90 :	77		
SP91 :	78		
SP92 :	75		
SP100 :	95		
SP102 :	97	98	
SP104 :	50		
SP105 :	51	52	
SP106 :	53		

Digital Inputs:

S0 :	32	110	
S1 :	100	130	131
S2 :	31		
S4 :	36	111	
S5 :	100	132	133
S6 :	35		
S8 :	40	112	
S9 :	100	134	135
S10 :	39		
S12 :	44	115	
S13 :	136	137	
S14 :	43		
S16 :	48	116	
S17 :	138	139	
S18 :	47		
S20 :	52	80	
S21 :	140	141	
S22 :	51		

S23 :	85								
S25 :	20								
S26 :	22								
S28 :	23								
S29 :	10	13							
S30 :	11								
S31 :	12								
S70 :	30	32	110						
S71 :	31	32	110						
S72 :	34	36	111						
S73 :	35	36	111						
S74 :	38	40	112						
S75 :	39	40	112						
S76 :	42	44	115						
S77 :	43	44	115						
S78 :	46	48	116						
S79 :	47	48	116						
S80 :	13	14	83	101	120	122	124	126	128
S81 :	60	61	81	101	114				
S82 :	62								
S83 :	5	63	101	114					
S85 :	70	71	101						
S86 :	72								
S87 :	73	101							
S88 :	75	76	101						
S89 :	77								
S90 :	78	101							
S91 :	20	86							
S92 :	81	82	83	84					
S93 :	22								
S94 :	23								
S95 :	10	118							
S96 :	11	83							
S97 :	12								
S100 :	5	7							
S104 :	50	52	53	80					
S105 :	51	52	80						
S121 :	96	98	100	107	110	120			
S122 :	96	98	100	107	111	122			
S123 :	100	112	124						
S125 :	87	115	126						
S126 :	87	116	128						
S128 :	80	83							
S131 :	106	107	108						
S132 :	106	107	108						
S133 :	106	107	108						
S135 :	86	87	88						
S136 :	86	87	88						
S141 :	107	108	110	120	121				
S142 :	107	108	111	122	123				
S143 :	107	108	112	124	125				
S145 :	87	88	115	126	127				
S146 :	87	88	116	128	129				
S160 :	5	6	7						
S169 :	5	6	32	36	40	44	48	52	
S172 :	2								
S173 :	2								

Digital Outputs:

P1 :	30	120	121	
P2 :	34	122	123	
P3 :	38	124	125	
P4 :	42	126	127	
P5 :	46	128	129	
P6 :	50	53	83	84

Timers/Counters:

T1 :	30	130	131								
T2 :	34	132	133								
T3 :	38	134	135								
T5 :	42	136	137								
T6 :	46	138	139								
T8 :	50	140	141								
T10 :	0										
T12 :	96	97	98								
T28 :	100	101	102	105							
T29 :	100	101	103	105							
T31 :	2	121	130								
T32 :	2	123	132								
T33 :	2	125	134								
T34 :	2										
T35 :	2	127	136								
T36 :	2	129	138								
T40 :	146										
T50 :	10										
T51 :	114	120	131								
T52 :	114	122	133								
T53 :	114	124	135								
T55 :	118	126	137								
T56 :	118	128	139								
T58 :	141										
T60 :	95	96	97	98	99	107					
T61 :	81	95	96	97	100	105					
T62 :	100	101									
T64 :	90	91	92	93	95	96	97	101	102	103	104
:	105	106									
T65 :	85	87									
T70 :	2	30									
T71 :	2	31	32								
T72 :	2	34									
T73 :	2	35	36								
T74 :	2	38									
T75 :	2	39	40								
T76 :	2	42									
T77 :	2	43	44								
T78 :	2	46									
T79 :	2	47	48								
T80 :	4	14	121	123	125	127	129				
T81 :	2	60									
T82 :	2	62									

T83 :	2	5	63	
T85 :	2	70		
T86 :	2	72		
T87 :	2	73		
T88 :	2	75		
T89 :	2	77		
T90 :	2	78		
T91 :	2	20		
T92 :	2	81	82	
T93 :	2	22		
T94 :	2	23		
T95 :	2	10		
T96 :	2	11		
T97 :	2	12		
T98 :	2			
T99 :	2			
T100 :	0	3	14	101
T104 :	2	50		
T105 :	2	51	52	
T106 :	2	53		

Indexes:

IR61 :	105
IR64 :	105
IR90 :	147
IR91 :	147
IR92 :	146
IR93 :	146

Gotos from Line:

2 :	150
85 :	83
90 :	87
99 :	97
104 :	101
110 :	107
122 :	120
124 :	122
126 :	124
128 :	126
130 :	128

Line Numbers in Use:

:	0	2	3	4	5	6	7	10	11	12	13
:	14	20	22	23	30	31	32	34	35	36	38
:	39	40	42	43	44	46	47	48	50	51	52
:	53	60	61	62	63	70	71	72	73	75	76
:	77	78	80	81	82	83	84	85	86	87	88
:	90	91	92	93	95	96	97	98	99	100	101

:	102	103	104	105	106	107	108	110	111	112	114
:	115	116	118	120	121	122	123	124	125	126	127
:	128	129	130	131	132	133	134	135	136	137	138
:	139	140	141	146	147	150					

L2000 SETUP

This section contains listings of setup tables for the L2000. Tables that are not used are omitted or shown as blank pages.

CONFIGURATION:

```

: -----[ PLC.INFO ]-----
PLC.NAME="RIO MESA H S"

: -----[ DO/DI ]-----
PHYS.DO=16
PHYS.DI=32
INTRN.DI=160
INT.DI.IDX=64

: -----[ AI/AO/SP ]-----
PHYS.AI=12
INTRN.AI=0
PHYS.AO=4
INTRN.AO=124
SP=128
INDEX=128

: -----[ INPT.SCAN ]-----
SCAN.TOP=OFF
SCAN.LINE=0
SCAN.RATE=1000
AI.COUNT=0

: -----[ TMR/CTR ]-----
PULSE.CTR=0
PULSE.MAP=0
PLS.DLY.0=100
PLS.DLY.1=100
PLS.DLY.2=100
PLS.DLY.3=100
PLS.DLY.4=100
PLS.DLY.5=100
PLS.DLY.6=100
PLS.DLY.7=100
PLS.DLY.8=100
PLS.DLY.9=100
PLS.DLY.10=100
PLS.DLY.11=100
PLS.DLY.12=100
PLS.DLY.13=100
PLS.DLY.14=100
PLS.DLY.15=100
HOUR.TMR=40
HMS.TMR=10
EVENT.CTR=20
SEC.TMR=50

: -----[ SPEC.REGS ]-----
WK.DAY.AO=93
MNTH.DY.AO=94
MONTH.AO=95
YEAR.AO=96
TIME.AO=90
DEBUG.SP=125
TLM.CTL.SP=126
CM.FAIL.DI=163
CM.FAIL.AO=91
UNRCH.AO=92
PWR.CNT.AO=97
RST.CNT.AO=98
RND.NUM.AO=99
NET.ADR.AO=100
RUN.DI=168           :running
SW.INT.LN=10000
SW.INT.DI=167
ACK.KEY.DI=162
DI.ACK=ON
ALM.ACK.DI=160
SECURE.DI=161
AC.FAIL.DI=166      :physical pfr
TRACE.IR=64
TRACE1.DI=164
TRACE2.DI=165
CRD.CNT.AO=101
HEALTH.DI=170

: -----[ NET/TLM ]-----
NET.ID=1
NODE.ADR=1           :rtu address
Q.STRT.DLY=500
Q.SCN.RATE=100
PCNT.THRS=100
PCNT.INTV=100
PWR.UP.DMP=ON
POLL.WRIT=OFF

: -----[ LOGGING ]-----
ALPHA.LVL=ERROR
RAM.LVL=INFO
NUM.MSG=128
RAM.WRAP=ON

: -----[ MONITOR ]-----
SCAN=OFF
SELF.TEST=OFF
NET.US=NONE
NET.ALL=NONE
NET.RETRY=NONE
NET.RAW=NONE
NET.QUEUE=NONE
DIAL=OFF
TRACE=OFF

: -----[ OUTPT.DVC ]-----
STD.OUT=NONE

: -----[ DISPLAY ]-----
LIQ5.DISP=ON         :large o/i
SCRLL.DLY=18
RFRSH.DLY=50
FLASH.DLY=50
TAG.RATE=3000
TAG.DLY=100
TAG.CTRL=ON
DFLT.PREC=2         :2 decimal
XMT.RCV=P1P2P3
LED.BLANK=OFF

: -----[ HOT.SBY ]-----
ENABLE=OFF
HBEAT.DO=4
HBEAT.CTR=0
HBEAT.WIN=50
HBEAT.DI=300
FAIL.DI=301
FAIL.DO1=1
FAIL.DO2=2
FAIL.DO3=3
DO.DELAY=15

: -----[ MISC ]-----
WP.CRC.RTE=6000
LOCK.TIME=300
MAX.IDL=8

: -----[ NET.COM1 ]-----
: ** Maintenance Port **
1.BAUD=19200
1.PARITY=NONE
1.STOPBIT=1
1.PROTO=LIQ
1.ANSR.DLY=10
1.LEAD.PAD=0
1.END.PAD=0
1.ACK.WAIT=300
1.ACK.MAX=10
1.IAK.WAIT=300
1.IAK.MAX=10
1.BSY.WAIT=500
    
```

CONFIGURATION (cont.):

1.BSY.MAX=10
1.RCN.WAIT=3000
1.Q.SIZE=10
1.CM.FL.ID=0
1.POLL.DLY=500
1.POLL.GAP=100
1.PLC.GAP=0
1.MSG.GAP=0

: ----- [NET.COM2]-----

2.BAUD=9600
2.PARITY=NONE
2.STOPBIT=1
2.DCD.BUSY=OFF
2.NO.SHAKE=OFF
2.PROTO=LIQ
2.ANSR.DLY=1
2.LEAD.PAD=1
2.END.PAD=0
2.ACK.WAIT=500
2.ACK.MAX=10
2.IAK.WAIT=300
2.IAK.MAX=10
2.BSY.WAIT=100
2.BSY.MAX=10
2.RCN.WAIT=3000
2.Q.SIZE=10
2.CM.FL.ID=0
2.POLL.DLY=500
2.POLL.GAP=500
2.PLC.GAP=100
2.MSG.GAP=50
2.DISBL.DI=172

: ----- [NET.COM3]-----

3.BAUD=9600
3.PARITY=NONE
3.STOPBIT=1
3.DCD.BUSY=OFF
3.NO.SHAKE=OFF
3.PROTO=LIQ
3.ANSR.DLY=1
3.LEAD.PAD=1
3.END.PAD=0
3.ACK.WAIT=500
3.ACK.MAX=10
3.IAK.WAIT=300
3.IAK.MAX=10
3.BSY.WAIT=100
3.BSY.MAX=10
3.RCN.WAIT=3000
3.Q.SIZE=10
3.CM.FL.ID=0
3.POLL.DLY=500
3.POLL.GAP=500
3.PLC.GAP=100
3.MSG.GAP=50
3.DISBL.DI=173

LEDS:

:** D.I.'s **

```

LED60=D10           :LED134=
:LED61=D1           :LED135=
LED62=D11           :LED136=
:LED63=D1           :LED137=
LED64=D12           :LED138=
:LED65=D1           :LED139=
LED66=D14           :** D.O.'s **
:LED67=D1           LED140=DO1
LED68=D15           :LED141=DO
:LED69=D1           LED142=DO2
LED70=D16           :LED143=DO
:LED71=D1           LED144=DO3
LED72=D18           :LED145=DO
:LED73=D1           LED146=DO4
LED74=D19           :LED147=DO
:LED75=D1           LED148=DO5
LED76=D110          :LED149=DO
:LED77=D1           LED150=DO6
LED78=D112          :LED151=DO
:LED79=D1           :LED152=DO
LED80=D113          :LED153=DO
:LED81=D1           :LED154=DO
LED82=D114          :LED155=DO
:LED83=D1           :LED156=DO
LED84=D116          :LED157=
:LED85=D1           :LED158=
LED86=D117          :LED159=
:LED87=D1           :LED160=
LED88=D118          :LED161=
:LED89=D1           :LED162=
LED90=D120          :LED163=
:LED91=D1           :** ALARMS **
LED92=D121          LED164=DO0C :Common
:LED93=D1           :LED165=D1
LED94=D122          LED166=D170A :Water P1
:LED95=D1           :LED167=D1
LED96=D123          LED168=D171A
:LED97=D1           :LED169=D1
LED98=D124          LED170=D172A :Water P2
:LED99=D1           :LED171=D1
LED100=D125         LED172=D173A
:LED101=D1          :LED173=D1
LED102=D129         LED174=D174A :Water P3
:LED103=D1          :LED175=D1
LED104=D130         LED176=D175
:LED105=D1          :LED177=D1
LED106=D131         LED178=D176A :Well P1
:LED107=D1          :LED179=D1
:LED108=D1          LED180=D177A
:LED109=D1          :LED181=D1
:LED110=D1          LED182=D178A :Well P2
:LED111=D1          :LED183=D1
:LED112=D1          LED184=D179A
:LED113=D1          :LED185=D1
:LED114=D1          LED186=D1104A :Air Cmpsr
:LED115=D1          :LED187=D1
:LED116=D1          LED188=D1105A
:LED117=D1          :LED189=D1
:LED118=D1          LED190=D181A :Sys PSI xducr
:LED119=            :LED191=D1
:LED120=            LED192=D182A
:LED121=            :LED193=D1
:LED122=            LED194=D183A
:LED123=            :LED195=D1
:LED124=            LED196=D185A :Hydro Lvl xducr
:LED125=            :LED197=D1
:LED126=            LED198=D186A
:LED127=            :LED199=D1
:LED128=            LED200=D187A
:LED129=            :LED201=D1
:LED130=            LED202=D195A :A/C phase
:LED131=            :LED203=D1
:LED132=            LED204=D196A :120 A/C
:LED133=            :LED205=D1
    
```

```

LED206=D197A      :PLC D/C
:LED207=D1
LED208=D188A      :Hydro PSI xducr
:LED209=D1
LED210=D189A
:LED211=D1
LED212=D190A
:LED213=D1
:LED214=D1
:LED215=D1
:LED216=D1
:LED217=D1
:LED218=D1
:LED219=
    
```

```

BEGIN
REGISTER=L0 :System PSI
TOP.LED=00
NUM.LEDS=60
LOW.VAL=0.0
HIGH.VAL=90.0
LL.MRK.REG=NONE
L.MRK.REG=NONE
H.MRK.REG=NONE
HH.MRK.REG=NONE
    
```

SETPOINTS:

SP0=10	SP75=0
SP1=10	SP76=0
SP2=10	SP77=0
SP3=30	SP78=0
SP4=10	SP79=0
SP5=10	SP80=0
SP6=10	SP81=- 10.0
SP7=10	SP82=30
SP8=10	SP83=80
SP9=10	SP84=110
SP10=10	SP85=0
SP11=10	SP86=0
SP12=10	SP87=0
SP13=10	SP88=0
SP14=10	SP89=0
SP15=10	SP90=0
SP16=10	SP91=0
SP17=10	SP92=0
SP18=10	SP93=0
SP19=10	SP94=0
SP20=10	SP95=0
SP21=10	SP96=0
SP22=10	SP97=0
SP23=10	SP98=0
SP24=10	SP99=0
SP25=10	SP100=0
SP26=10	SP101=0
SP27=10	SP102=10
SP28=10	SP103=0
SP29=10	SP104=10
SP30=10	SP105=10
SP31=10	SP106=0
SP32=10	SP107=0
SP33=10	SP108=0
SP34=10	SP109=0
SP35=10	SP110=0
SP36=10	SP111=0
SP37=10	SP112=0
SP38=10	SP113=0
SP39=10	SP114=0
SP40=0	SP115=0
SP41=45	SP116=0
SP42=40	SP117=0
SP43=35	SP118=0
SP44=0	SP119=0
SP45=0	SP120=0
SP46=0	SP121=0
SP47=0	SP122=0
SP48=0	SP123=0
SP49=0	SP124=0
SP50=0	SP125=0
SP51=0	SP126=0
SP52=0	SP127=0
SP53=0	
SP54=0	
SP55=0	
SP56=0	
SP57=0	
SP58=0	
SP59=0	
SP60=0	
SP61=0	
SP62=0	
SP63=0	
SP64=0	
SP65=0	
SP66=0	
SP67=0	
SP68=0	
SP69=0	
SP70=0	
SP71=70	
SP72=65	
SP73=60	
SP74=0	

FILTERS:

AORESET0=ON
AORESET1=ON
AORESET2=ON
AORESET3=ON
AIFILTER0=1
AIFILTER1=1
AIFILTER2=1
AIFILTER3=1
AIFILTER4=1
AIFILTER5=1
AIFILTER6=1
AIFILTER7=1
AIFILTER8=1
AIFILTER9=1
AIFILTER10=1
AIFILTER11=1

CALIBRATIONS:

BEGIN
 REG=A10
 TYPE=4-20MA
 1.ENGR=0
 1.METER=4
 2.ENGR=100
 2.METER=20

BEGIN
 REG=A11
 TYPE=4-20MA
 1.ENGR=0
 1.METER=4
 2.ENGR=58
 2.METER=20

BEGIN
 REG=A12
 TYPE=4-20MA
 1.ENGR=0
 1.METER=4
 2.ENGR=100
 2.METER=20

BEGIN
 REG=A13
 TYPE=4-20MA
 1.ENGR=0
 1.METER=4
 2.ENGR=100
 2.METER=20

BEGIN
 REG=A14
 TYPE=4-20MA
 1.ENGR=0
 1.METER=4
 2.ENGR=100
 2.METER=20

BEGIN
 REG=A15
 TYPE=4-20MA
 1.ENGR=0
 1.METER=4
 2.ENGR=100
 2.METER=20

BEGIN
 REG=A16
 TYPE=4-20MA
 1.ENGR=0
 1.METER=4
 2.ENGR=100
 2.METER=20

BEGIN
 REG=A17
 TYPE=4-20MA
 1.ENGR=0
 1.METER=4
 2.ENGR=100
 2.METER=20

BEGIN
 REG=A18
 TYPE=4-20MA
 1.ENGR=0
 1.METER=4
 2.ENGR=100
 2.METER=20

BEGIN
 REG=A19
 TYPE=4-20MA

1.ENGR=0
 1.METER=4
 2.ENGR=100
 2.METER=20

BEGIN
 REG=A110
 TYPE=4-20MA
 1.ENGR=0
 1.METER=4
 2.ENGR=100
 2.METER=20

BEGIN
 REG=A111
 TYPE=4-20MA
 1.ENGR=0
 1.METER=4
 2.ENGR=100
 2.METER=20

BEGIN
 REG=A00
 TYPE=4-20MA
 1.ENGR=0
 1.METER=4
 2.ENGR=100
 2.METER=20

BEGIN
 REG=AO1
 TYPE=4-20MA
 1.ENGR=0
 1.METER=4
 2.ENGR=100
 2.METER=20

BEGIN
 REG=AO2
 TYPE=4-20MA
 1.ENGR=0
 1.METER=4
 2.ENGR=100
 2.METER=20

BEGIN
 REG=AO3
 TYPE=4-20MA
 1.ENGR=0
 1.METER=4
 2.ENGR=100
 2.METER=20

```

1- IR81 < 1 OR IR81 > 2 :..macro # limit
  ACTION EXAM L0 AND 1 STORE IR81 :Sys Pressure
  ELSE IR81 EQ 1
  ACTION EXAM L1 AND IR81 INCR :Tank Level
2- IR82 < 1 OR IR82 > 6 :..macro # limit
  ACTION EXAM SP41 AND 1 STORE IR82 :Lead Start
  ELSE IR82 EQ 1
  ACTION EXAM SP71 AND IR82 INCR :Lead Stop
  ELSE IR82 EQ 2
  ACTION EXAM SP42 AND IR82 INCR :Lag Start
  ELSE IR82 EQ 3
  ACTION EXAM SP72 AND IR82 INCR :Lag Stop
  ELSE IR82 EQ 4
  ACTION EXAM SP43 AND IR82 INCR :Lag1 Start
  ELSE IR82 EQ 5
  ACTION EXAM SP73 AND IR82 INCR :Lag1 Stop
3- IR83 < 1 OR IR83 > 2 :..macro # limit
  ACTION EXAM SP82 AND 1 STORE IR83 :Pressure Low
  ELSE IR83 EQ 1
  ACTION EXAM SP83 AND IR83 INCR :Pressure High
4- S168 OFF AND S160 OFF :..Standby Mode
  ACTION S160 ON :Alarm Ack. On
  ELSE S168 OFF AND S160 ON :Alarm Ack. Off
  ACTION S160 OFF :..
  ELSE ACTION S169 ON :Alarm Reset On

```

TAGS :

```

BEGIN
REG=A10
PREC=1
UNITS="PSI"
TAGNAME=""
DESCRIPTION="SYSTEM PRESSURE"

BEGIN
REG=A11
PREC=1
UNITS="INCH"
TAGNAME=""
DESCRIPTION="HYDRO TANK LEVEL"

BEGIN
REG=AO10
PREC=1
UNITS="PSI"
TAGNAME=""
DESCRIPTION="SYSTEM PRESSURE"

BEGIN
REG=AO11
PREC=1
UNITS="INCH"
TAGNAME=""
DESCRIPTION="HYDRO TANK LEVEL"

BEGIN
REG=SP41
PREC=1
UNITS="PSI"
TAGNAME=""
DESCRIPTION="Lead water pump start"

BEGIN
REG=SP42
PREC=1
UNITS="PSI"
TAGNAME=""
DESCRIPTION="Lag water pump start"

BEGIN
REG=SP43
PREC=1
UNITS="PSI"
TAGNAME=""
DESCRIPTION="Lag1 water pump start"

BEGIN
REG=SP71
PREC=1
UNITS="PSI"
TAGNAME=""
DESCRIPTION="Lead water pump stop"

BEGIN
REG=SP72
PREC=1
UNITS="PSI"
TAGNAME=""
DESCRIPTION="Lag water pump stop"

BEGIN
REG=SP73
PREC=1
UNITS="PSI"
TAGNAME=""
DESCRIPTION="Lag1 water pump stop"

BEGIN
REG=SP81
PREC=1
UNITS="PSI"
TAGNAME=""

```

```

DESCRIPTION="Pressure xducr fail low"

BEGIN
REG=SP82
PREC=1
UNITS="PSI"
TAGNAME=""
DESCRIPTION="System pressure low"

BEGIN
REG=SP83
PREC=1
UNITS="PSI"
TAGNAME=""
DESCRIPTION="System pressure high"

BEGIN
REG=SP84
PREC=1
UNITS="PSI"
TAGNAME=""
DESCRIPTION="Pressure xducr fail high"

BEGIN
REG=T1
PREC=2
UNITS=""
TAGNAME=""
DESCRIPTION="WATER PUMP 1 HOURS"

BEGIN
REG=T2
PREC=2
UNITS=""
TAGNAME=""
DESCRIPTION="WATER PUMP 2 HOURS"

BEGIN
REG=T3
PREC=2
UNITS=""
TAGNAME=""
DESCRIPTION="WATER PUMP 3 HOURS"

BEGIN
REG=T5
PREC=2
UNITS=""
TAGNAME=""
DESCRIPTION="WELL PUMP 1 HOURS"

BEGIN
REG=T6
PREC=2
UNITS=""
TAGNAME=""
DESCRIPTION="WELL PUMP 2 HOURS"

BEGIN
REG=T51
PREC=0
UNITS=""
TAGNAME=""
DESCRIPTION="WATER PUMP 1 STARTS"

BEGIN
REG=T52
PREC=0
UNITS=""
TAGNAME=""
DESCRIPTION="WATER PUMP 2 STARTS"

BEGIN
REG=T53
PREC=0

```


TAGS (cont.):

UNITS=""
TAGNAME=""
DESCRIPTION="WATER PUMP 3 STARTS"

BEGIN
REG=T55
PREC=0
UNITS=""
TAGNAME=""
DESCRIPTION="WELL PUMP 1 STARTS"

BEGIN
REG=T56
PREC=0
UNITS=""
TAGNAME=""
DESCRIPTION="WELL PUMP 2 STARTS"

Pressure / Level

Control Setpoints

Alarm Setpoints

PLC Alarm Reset

T34350

T34350

LIQ 5/30th PC

OXNARD SCHOOL DISTRICT Rio Mesa High School Pump Station

System Pressure in PSI

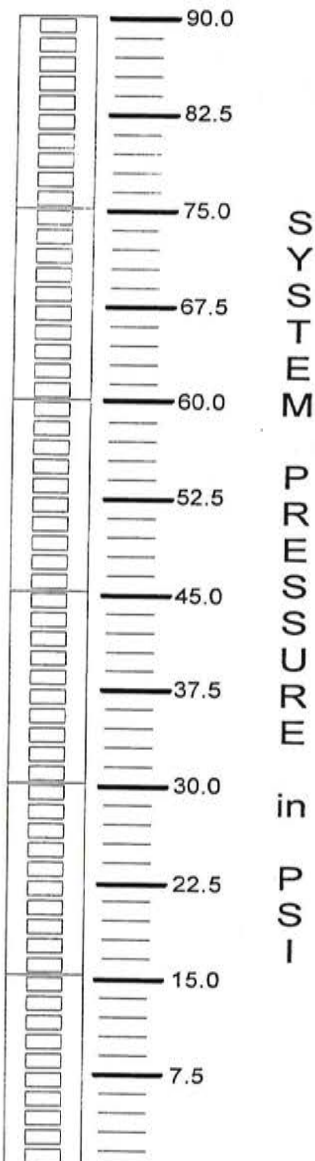
- SP84 --- Pressure Xducr Fail High
- SP83 --- High Pressure Alarm
- SP71 --- Lead Water Pump Stop
- SP72 --- Lag Water Pump Stop
- SP73 --- Lag1 Water Pump Stop
- SP41 --- Lead Water Pump Start
- SP42 --- Lag Water Pump Start
- SP43 --- Lag1 Water Pump Start
- SP82 --- Low Pressure Alarm
- SP81 --- Pressure Xducr Fail Low

Water Pump Call Sequence:

SP100-> # = Lead Pump (1 or 2)
 0 = Auto-Alternate
 note: Pump 3 always Lag1

SP102-> ### = Run-time Alternate 1 & 2 (hours)

LIQ 5/30th PC



T34350

Hydro Tank Pressure in PSI

- SP92 --- Pressure Xducr Fail High
- SP91 --- High Pressure Alarm
- SP77 --- Air Compressor Stop
- SP47 --- Air Compressor Start
- SP90 --- Low Pressure Alarm
- SP89 --- Pressure Xducr Fail Low

DIGITAL INPUTS

- Water Pump 1 in Auto
- Water Pump 1 Running
- Water Pump 1 Overload
- Water Pump 2 in Auto
- Water Pump 2 Running
- Water Pump 2 Overload
- Water Pump 3 in Auto
- Water Pump 3 Running
- Water Pump 3 Overload
- Well Pump 1 in Auto
- Well Pump 1 Running
- Well Pump 1 Overload
- Well Pump 2 in Auto
- Well Pump 2 Running
- Well Pump 2 Overload
- Air Compressor in Auto
- Air Compressor Running
- Air Compressor Overload
- Well Pump 1 Selected
- Well Pump 2 Selected
- Well Pump Call Switch
- A/C Phase Fail
- 120 A/C Power Fail
- PLC D/C Power Fail



STATUS

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DIGITAL OUTPUTS

- Water Pump 1 Call
- Water Pump 2 Call
- Water Pump 3 Call
- Well Pump 1 Call
- Well Pump 2 Call
- Air Compressor Call

ALARMS

- Common Alarm
- Water Pump 1 Start Fail
- Water Pump 1 Overload
- Water Pump 2 Start Fail
- Water Pump 2 Overload
- Water Pump 3 Start Fail
- Water Pump 3 Overload
- Well Pump 1 Start Fail
- Well Pump 1 Overload
- Well Pump 2 Start Fail
- Well Pump 2 Overload
- Air Cmpsr Start Fail
- Air Compressor Overload
- System Press Xducr Fail -
- System Pressure Low -
- System Pressure High
- Hydro Tank Lvl Xducr Fail
- Hydro Tank Level Low
- Hydro Tank Level High
- A/C Phase Fail
- 120 A/C Power Fail
- PLC D/C Power Fail
- Hydro Tank PSI Xducr Fail
- Hydro Tank Pressure Low
- Hydro Tank Pressure High



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