vertex control of carriage house file hagen\wpfiles\vertexdoc\ chcontrol

To: file
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Subject: Vertex control of carriage house

The Carriage House drive system uses fewer motors and few digital control bits than the azimuth and gregorian drive system. Let's examine the control structure in detail.

The control signal are as follows:

Analog from PLC to DCS
1. *speed setpoint*: analog pair from PLC analog out DW244 (program Data Word 244) to the DCS. Requested velocity.

2. *Torque Bias + Gravity Compenstation 1* (bias current request for Motor 1) from PLC analog out
DW252

3. *Torque Bias + Gravity Compenstation 2* (bias current request for Motor 1) from PLC analog out DW252

Analog to Kollmorgen Amplifiers from DCS
4. *Current set point M1* (current command) to Kollmorgen amp 03U01, which feeds motor M1 (03Mm01)

5. *Current set point M2* (current command) to Kollmorgen amp 04U01, which feeds motor M2 (04M01)

Analog from Kollmorgen Amplifiers to DCS
6. *Actual Speed M1*: tachometer signal from Kollmorgen amp 03U01 (Motor 1's amplifier)

7. *Actual Speed M2*: tachometer signal from Kollmorgen amp 04U01 (Motor 2's amplifier)

Analog from DCS to PLC
8. *Actual Speed CH* : average of tachometer signals, sent to PLC analog input word IW164

Analog from Kollmorgen Amplifiers direct to PLC
9 & 10. The motor currents, measured within the amplifiers, are sent to the PLC as anlog input words IW168 (Motor 1) and IW170 (Motor 2)

Digital from PLC to DCS
Move up from digital output 18.6

Move down from digital output 18.7
Load tach Carriage House 1 from digital output 2.6
Load tach Carriage House 2 from digital output 2.7
Load setpoint Carriage House 1 (Rate) from digital output 3.0
Load setpopint carriage House 2 (PLC) from digital output 3.1
Acceleration ramp carriage house slow from digital output 3.2
Torque bias carriage house on from digital output 3.3
Sum_n controller on from digital output 3.4
Delta_n controller on from digital output 3.5
I portion of n-loop on from digital output 3.6
Gravity compensation Carriage house on from digital output 3.7

PLC to Kollmorgen Amplifiers via relays
Enable amplifier Carriage House 11 from digital output 2.0 via relay 29CR01
Enable amplifier Carriage House 12 from digital output 2.1 via relay 29CR02
Main contactor Carriage House on from digital output 2.2 via relay 29CR03
Release brake Carriage House 11 from digital output 2.3 via relay 29CR04
Release brake Carriage House 12 from digital output 2.4 via relay 29CR05
Preset encoder Carriage House from digital output 2.5 via relay 29CR08

Digital from Kollmorgen Amplifiers direct to PLC

Digital from DCS to PLC
Speed zero to digital input 19.7

Digital from Kolmorgen

Digital from Limit switches to DCS and to PLC
Prelimit Down from switch to DCS X1:8 and to dig. input 19.1
Prelimit Up from switch to DCS X1:9 and to dig. input 19.3
(note that "up" and "down" are reversed on schematic page CH 20).

Ditital from Limit switches to PLC

Limit Down to digital input 19.2
Limit Up to digital input 19.4
Carriage house emergency limit down to digital input 19.5
Carriage house emergency limit up to digital input 19.6

Digital from Limit switches to PLC

Digital Inputs tied low on DCS
Load setpoint (x1:7)
????? (x2:28)

Digital from Power Supplies to PLC
Fault contact from PSR4 to digital input 18.0