BSY Pump Station Upgrade Controls

TERMS: STATES TRANSITIONS ACTIONS MODES

PUMP: A control button or switch which when activated instructs the control system to transition from the current state to the VACUUM state. This may include starting pumps, and opening valves.

STOP: A control button or switch which when activated instructs the control system to transition a pump from the Normal Operation to the IDLE state.

VENT: A control button or switch which when activated instructs the control system to transition from the current state to the VENTED state. This may include closing gate valves, stopping pumps as well as opening venting valves. The design of the BSY pumping system is not intended to allow automated venting of the BSY, it requires a technician to be present in the PS-5 building, manually connect to the vent valve, and manually open the vent valve. The pumping system is designed to allow automated venting of pumps isolated from the BSY vacuum.

STEP: The sequencer mode in which the sequencer requires an operator to actuate the NEXT action to move the sequencer from it’s current stage to the next stage, even if the stage is in between STATES.

GO: The sequencer mode in which the sequencer automatically advances from the CURRENT state to the GOAL state. For example from VENTED to VACUUM, or from VACUUM to VENTED. The design of the BSY pumping system is not intended to allow automated sequencing from VENTED to VACUUM or VACUUM to VENTED for the BSY.

READY: A state of a device or system in which it’s interlocks are satisfied and it has not been disabled.

OPENED: A state of a valve in which it is completely out of the way of gas flow, and the position sensor associate with this position is activated.

CLOSED: A state of a valve in which it blocks gas flow, and the position sensor associated with this position is activated.

VACUUM: A state of the system in which the turbo pump is operating, the gate valve is open, and the chamber is at a pressure lower than the roughed state.

OPEN: A control button or switch which when activated instructs the control system to open a valve.

MOVING: A transition of a valve, intermediate between opened and closed.

CLOSE: A control button or switch which when activated instructs the control system to close a valve.

ENABLE: A control button or switch which when activated allows a controlled device to operate or a transition to occur.

DISABLE: A control button or switch which when activated prevents a controlled device from operating or a transition from occurring.

OFF: A state of a pump or controller, in which it is powered off, either at the power source or device power switch. It requires manual action at the site of the pump or controller to change from this state. It may, or may not be in LOTO.

ON: A state of a pump or controller, in which power has been turned on and the pump or controller is operating. If possible, the pump or controller is in communication with the control system. This can include the IDLE state, as well as STANDBY and NORMAL operating states.

STATE: A member of a limited set of defined stable conditions of the system and controller.

TRANSITION: A defined sequence of changes to take the system from one STATE to another STATE.

LOW\_SPEED\_READY: A state of a turbo or roots pump in which the device is running at its programmed Low Speed.

NORMAL\_SPEED: A state of a turbo or roots pump in which the device is running at its programmed normal speed. It can be running at normal speed, but isolated from the chamber or line by a closed isolation valve.

IDLE: A state of a pump in which it is powered on, but not active. Its state can be changed by the sequencer or by an operation using the control system.

STANDBY: A state of a pump in which it is operating normally, but it is operating against a closed valve.

MODE: The possible states of the system sequencer. These include STEP, GO, OFF states.

STARTING: A transition, where a device, such as a turbo pump or backing pump has been commanded to become operations, and is performing internal steps under self control. For example, the period of time between when power has been applied to a motor and when it reaches normal speed. This may include the time a device performs internal self-checks.

RAMPING: A transition state for a turbo pump during which it is changing speed, either speeding up or slowing down.

ROUGHING: A transition state for a chamber or other vacuum line, during which active pumping is being performed, by the roughing pump. During this transition the roughing pump is running and the roughing valve is open.

CONTROLS TERMS

Roughing

Spare

Pump RUN CMD (P501, P502)

Low Speed CMD (P501, P502)

Reset CMD (P501, P502)

Pump RUN/Stop Status (Closed=RUN)

Warning Status (Open=Warning)

Alarm Status ((Open=Alarm)

Remote/Local Status (Closed=Remote)

24VSTATUS

OPEMCNDLOCAL

CLOSECMDLOCAL

INTLKRESET (P501, P503, P502, P504, P510)  
OPENSTATUS (P501, P503, P502, P504, P510)

CLOSEDSTATUS (P501, P503, P502, P504, P510)

AIRSTATUS (P501,P503,P502,P504,P510)

MODESWITCH1 (P501, P503, P502, P504, P510)

MODESWITCH2 (P501, P503, P502, P504, P510)

OPENSOLENOID (P501, P503, P502, P504, P510)

CH4OK

CH4BYP

CH4FAULT

INTLKSUMTRIP (P501, P503, P502, P504, P510)

ForeLine Pnuematic Valve (P501, P502)

Pneumatic Gate Valve (P503, P504)

Vacuum Pneumatic Roughing Valve (P510)