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for

Westinghouse Hanford Company

P.O. Box 1970
Richland, WA 99352

MASTER

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1.0 INTRODUCTION

This document provides descriptions of components and tasks that are involved in the computer system for the data acquisition and control of spare pump tests conducted at the Hanford Nuclear Reservation. The system was designed and implemented by Los Alamos National Laboratory and supplied to Westinghouse Hanford Company. The computers (both personal computers and specialized data-taking computers) and the software programs of the system will hereafter collectively be referred to as the MiniDACS (Minimum Data Acquisition and Control System).

1.1 Purpose

This document is for individuals who need a detailed understanding of the components that comprise the system and the functions they perform.

1.2 Scope

MiniDACS is designed for control and data collection for the spare pump testing facility.

The positioning of the pump and operation of the pump is controlled by the MiniDACS, with the test operators commanding the system. There are many instruments used to monitor process variables that are critical to pump operation. The MiniDACS collects data from these instruments, displays real-time data for operators (and test engineers and analysis teams), and archives the data for later analysis; it also interfaces with control elements and safeguards the operation of the test equipment.

The MiniDACS is composed of several components working in parallel to perform the tasks needed for test operation and monitoring.

There is a variable frequency drive that controls a motor that will move the position of the pump to different angles. A second variable frequency drive controls a motor which drives the pump.

A PLC (Programmable Logic Controller) interfaces with instrumentation to monitor signals. This PLC has embedded logic to assure safe operation of the pump and to process data for interface to a supervisory network computer system.

A network computer system, using a multi-tasking software shell called Genesis, brings together all data gathered from operator input, the PLC, and the variable frequency drives. The Genesis system is used to collect data from the PLC and from the variable frequency drives controlling the motors. Genesis displays this data in real time and in a graphic format to the test engineers and data analysis teams. The system also stores data to files that can be analyzed at any time and these files are archived for later analysis.

The Genesis system also is used to control the variable frequency drives' operation from operator requests. There is embedded logic in the Genesis system to

warn test engineers of critical conditions and ensure safe operation of the pump motors.

The Genesis system supports peer-to-peer network communications to enable data to be shared between terminals. The Genesis network also supports host communications to multiple supervisory stations, allowing several consoles to access common data.

1.3 Overview

This document provides a description of the system in ever-increasing detail. First the general organization of system components is shown in Section 2, "System Layout." Then, in Section 3, "System Functions," the MiniDACS tasks are broken down and an overview of each component's purpose is given. Finally, in Section 4, "Design Details," the intricacies of how each task is accomplished are supplied.

1.4 Conventions and Definitions

This document contains some formalism to aid in its descriptions. These, as well as acronyms that are used, are given in the sections that follow.

1.4.1 Formatting Conventions. The Genesis multi-tasking software application is embodied in a database referred to as a strategy. Strategies are organized by algorithm blocks, which have a type and a tag name. The block types are denoted by an *italic* font. The block tag names will be encapsulated in angle brackets; for example, <TAGNAME>.

1.4.2 Acronyms. The following acronyms are used:

MiniDACS	Minimum Data Acquisition and Control System
PLC	Programmable Logic Controller
R&R	Report and Recipe
RSS	Remote Supervisory Station
SDD	System Design Description
VFD	Variable Frequency Drive
WHC	Westinghouse Hanford Company

2.0 SYSTEM LAYOUT

The MiniDACS contains several components that function in parallel to perform data collection and analysis, data display, alarm indication, monitoring, pump control, and archiving functions. Each component is carefully chosen, based on its capabilities, to perform a specific task. Their close choreography is required to meet the performance requirements of the system.

The system is designed to collect data from the field, display the data to test engineers, and log the data for later analysis. The system has the ability to warn the test engineers of critical conditions. There are control functions embedded in the system to control the position and operation of the pump. During pump control there are several checks on the critical signals to abort operation when a problem is detected. The system is designed to have enhanced effectiveness by being user friendly, and has built-in protection to make the test operation safe.

Information must be exchanged between components to integrate all of the data and control signals into a workable whole. Communication routines are implemented to read signals and data from the PLC and AF5000 devices and to send control commands to the pump equipment. The display terminals share data over a real-time data network. This network allows multiple users to share information on critical signals and control commands.

2.1 Component Layout

The MiniDACS is composed of a Modicon PLC, two Eaton AF5000+ frequency drives, a Genesis data collection runtime station, a Genesis pump control runtime station, and a console for sharing data from the data collection runtime station and interfacing with the PLC.

The Eaton AF5000+ frequency drives are used to control electrical motors. The units have microprocessors that have logic functions specifically designed to control the motor and provide for its safe operation. The reading of parameters and sending of control commands for the frequency drives can be done from the front panel of the unit or from serial communication commands. The operating status of the drive can be viewed from the front panel of the unit or it can be requested by serial communication polling.

A communication driver has been written to communicate with the Eaton AF5000+ frequency drives to request data and send control commands. This driver has been specifically designed to function within a personal computer running the Genesis multi-tasking software.

The Genesis multi-tasking software is used to display real-time data from the field, perform logic functions, and send commands to the control devices. Each Genesis application is embodied in a database which is referred to as a strategy. This strategy contains algorithms that are executed at specific rates. The algorithms in the

strategy are graphically selected by placing blocks in the strategy configuration environment. There are different kinds of algorithm blocks that can be used in the strategy to read data from hardware devices and write data to hardware devices. Genesis provides control-based algorithm blocks to build control logic.

Personal computers that use Genesis to update a strategy from hardware devices are considered runtime stations. Real-time displays are dynamically updated from the current values of the parameters in the algorithm blocks in the Genesis strategy. These displays are interactive and are designed to show current signal readings and allow the test engineers to change operating parameters. The Genesis software is used to bring data from the field together, perform calculations on that data, and then display the results to the test engineers.

Each Genesis runtime application can share its data to other Genesis stations over a real-time data network called Gen-Net. The Gen-Net is used to transfer selected real-time data and files between personal computers running the Genesis software. The physical layer of the Gen-Net uses ArcNet hardware in a star configuration. All Gen-Net stations are connected to an active hub with coaxial cable.

One of the Genesis runtime stations is used to pass data to and from the Modicon PLC. Information is retrieved and sent to the PLC with a Modicon ModBus Plus communication driver that executes in parallel with the other Genesis runtime functions. This runtime station is called STATION5 on the Genesis Gen-Net. The Genesis strategy that is executed in this station is called MASFTTEST.

Another Genesis runtime station is used for pump control and communicates to the two frequency drives used to position and control the pump. This runtime station is called STATION8 on the Gen-Net. It also passes data to and from the PLC. This is how data is transferred from the frequency drives to the PLC. The Genesis strategy that is executed in this station is called MASFPUMP.

STATION7 can be a second console to the MASFTTEST strategy on STATION5 as a Remote Supervisory Station (RSS). The console can bring up dynamic displays that update directly from the MASFTTEST strategy. STATION7 can also serve as a direct interface to the PLC using MODSOFT ladder logic configuration software.

Figure 1 is a diagram of the physical connections between components.

Fig. 1. Diagram of the physical connections between components.

2.2 Logical Flow of Data

Analog and discrete field signals are read from the instruments into the PLC and allocated into registers. This register data is retrieved from the STATION5 running the MASFTTEST strategy. This updates the MASFTTEST strategy algorithm blocks that are used to read data from the PLC. Data values are sent back to the PLC from algorithm blocks that are used to write data to the PLC. The MOTOR strategy is used to communicate bi-directionally with both variable frequency drives. For motor control STATION8 will run the MASFPUMP strategy. PLC communications allows STATION5 and STATION8 to share data between the MASFTTEST and MASFPUMP strategies.

The local RSS STATION7 linked to the MASFTEST strategy can receive and send values to the MASFTEST strategy.

Figure 2 shows the data and control paths between components.

Fig. 2. Data and control paths between components.

2.3 Task Allocation to Components

Each component performs at least one main task needed for the system. The following section is a breakdown of the tasks that are performed by each component.

2.3.1 Modicon PLC. The functions of the Modicon PLC are to input data from the field, to abort the pump when critical channels are beyond their abort limits, to

provide control and alarm signals and the logic to generate them, to provide timers and enable logic for pump testing, and to provide data and status information to Genesis.

2.3.2 Eaton AF-5000+ Variable Frequency Drives. The variable frequency drives control the motors used to position and operate the pump. Each drive controls its respective motor's critical parameters such as speed, acceleration, deceleration, and maximum speed as well as the starting and stopping of the motor. The drive also monitors current, line voltage, actual speed, and current state of the motor.

The frequency drives communicate with the Genesis MASFPUMP strategy via RS-232 serial communications. Each frequency drive has a unique address for these communications. The drive that controls the pump motor is addressed as 1, and the drive that controls the directional motor is addressed as 2. Genesis only acts in a supervisory role in controlling the motors; the drives can run the motors independent of Genesis communication.

A special signal from the pump motor drive that indicates when the motor is running is wired directly to a discrete input module. This signal is then used by the PLC for accurate timing of the duration of a test run.

2.3.3 MASFTTEST Strategy Terminal, STATION5. STATION5 is the primary data acquisition computer and is connected to the Modicon 984 PLC via a ModBus Plus card in STATION5. The strategy functions that STATION5 has to perform are: send and retrieve field values from the Modicon 984 I/O drops, write those engineering values to disk as Genesis history files, participate in the watchdog timer with the 984 ladder logic, provide dynamic display data for operator feedback, download abort limits to the PLC, and generate operator alarms.

2.3.4 MASFPUMP Strategy Terminal, STATION8. This personal computer is dedicated to running the Genesis Runtime MASFPUMP strategy. The Gen-Net node name STATION8 is used to reference this component.

The main task STATION8 performs is to communicate with the AF5000+ variable frequency drives to monitor data from the drives and send commands to them. This is performed with the Eaton AF5000+ Genesis communications driver.

The MASFPUMP strategy contains logic to control the positioning of the pump. This logic uses operator input, the current status of the pump and directional motors, and the current feedback signal levels of the critical variables in the waste tank to determine what the directional motor should do. This task will command the directional motor's frequency drive to move the pump to the operator's desired position when all conditions are correct.

The mixing pump motor is controlled through its variable frequency drive by the logic associated with the pump operation in the MASFPUMP strategy. The logic uses

the current values of the critical variables in the field test to decide if commands from the operators to start the motors should be honored. If allowable, commands are sent to change the pump's operating status.

There is logic embedded in the MASFPUMP strategy to abort the directional or pump motor operation. This task will immediately shut down operation of either motor if any of the abort criteria becomes active. STATION8 will display alarm conditions in the alarm summary and warn the operator with an audible alarm when a signal goes into alarm state.

The critical control variables for each VFD are set directly by the operator. The desired pump operation time is set by the operator and there is a timing circuit in the MASFPUMP strategy and a timing circuit in the PLC to automatically stop pump operation when the desired time is reached.

2.3.5 Local RSS Terminal, STATION7. The remote supervisory station (RSS) allows access to the runtime station MASFTTEST strategy through graphic displays that were developed for the MASFTTEST strategy. This network station allows the operator to display and change values in the runtime strategy.

3.0 SYSTEM FUNCTIONS

The tasks that are performed by the MiniDACS are allocated to the PLC, the Eaton AF5000+ variable frequency drives, or the Genesis supervisory control software. The following sections give an overview of those tasks for each of the components.

3.1 Instrument Monitoring and Data Collection Function (MASFTEST Strategy)

The main functions of the MASFTEST strategy are to monitor the status and values read from the critical signal instruments, log data, generate alarms, and change values in the PLC. Essential to these functions is communication with the Modicon PLC which contains data from the field, status information on abort criteria, and status from the VFD's via the Genesis strategy MASFPUMP run by STATION8. Once the data is brought in from the PLC to the strategy the values can be displayed to the operator. Given below is an overview of these MASFTEST strategy functions and the communication paths needed to accomplish them. The details are reserved for Chapter 4.

3.1.1 MASFTEST Strategy Communications. The MASFTEST strategy communicates with the Modicon PLC via ModBus Plus multiple drop communications. It also shares on-line data with STATION7 via Gen-Net network communications on ArcNet. The RSS station is complete terminal duplication of what data is resident in the MASFTEST strategy running on STATION5. The type of data communicated via each of these pathways is discussed briefly below.

3.1.1.1 Communications with the Modicon PLC. All of the pump instrumentation data enter the MASFTEST strategy from the PLC via the ModBus Plus link. This includes data such as mixer nozzle pressure, pump column N2 pressure, volute pressure, mixer pump shroud N2 pressure, mixer pump leg N2 pressure, motor oil temperature, mixer nozzle temperature, instrument cabinet temperature, pump casing vibration, column strain, motor position, and spare signals for backup values. Discrete signals are also retrieved from the PLC which include moisture in motor oil, position limit switches, and pump motor active. There are other signals received from the PLC such as watchdog bits to monitor function of the PLC communications, abort conditions that have occurred, instrument failures, I/O health status, and critical signals from the VFD's. These signals enter the MASFTEST strategy through one of two device blocks called DEV 1 and DEV 2. The device blocks accomplish the mapping between the PLC registers and the Genesis TEST strategy I/O blocks. The device blocks together with the I/O blocks scale the data to engineering units. The data are then available to be logged to the hard disk, used for alarm indication, or displayed on any of a number of user display screens for the MASFTEST strategy..

The communication with the PLC is a two-way communication, and information is sent from the MASFTEST strategy to the PLC. The MASFTEST strategy sends abort limit values to the PLC for use in the abort comparison logic. It will send an operator-initiated abort reset signal to the PLC, which resets the PLC abort logic.

3.1.1.2 Communications from the MASFTEST Strategy to the RSS Stations. Communication with the RSS stations is via ArcNet . These stations can display any of the MASFTEST strategy screens for data monitoring. This communications is bi-directional. The operator can change any value from an RSS that can be changed at STATION5.

3.1.2 Data Monitoring. Data monitoring is one of the primary functions of the MASFTEST strategy. Pump instrumentation data and system status information are presented on a number of operator display screens. The operator displays fall into four basic screens plus a MENU screen.

The MENU screen shows the organization of all of the other screens in the system, and is used primarily to navigate to the other screens.

3.1.2.1 Abort Status Monitoring, PUMPALRM. The screen primary used to determine abort conditions is the PUMPALRM display which shows any alarm or abort conditions in the system highlighted red. There is a low alarm, high alarm, and abort level shown for each signal. The condition limit will become red along with the signal name and value to show what status the signal is in. Abort conditions will lock in if the abort coil in the PLC is made active by the condition. To reset the abort coil in the PLC there is a button labeled Reset Abort Coil in the lower right corner.

This screen allows the operator to monitor critical safety-related measurements. These are measurements that need to be within predetermined limits before the pump can be operated safely. These measurements generally have automatic abort functions located in the PLC that automatically shut off the pump motor when the abort limit is exceeded. They generally have alarms associated with them that alert the operator if their value is approaching the abort limit.

3.1.2.2 Pump Measurement Monitoring, PUMP. This screen allows the operator to view any of the pump instrumentation measurements. The data is presented in a graphic format to show placement of the critical signals for the pump.

3.1.2.3 System Status Monitoring, IOSTATUS. The IOSTATUS display allows the operator to monitor the status of the Modicon I/O modules and racks. If a rack or slot is in error the location will be indicated by BAD in red versus OK in green for healthy.

3.1.2.4 Trending, PUMPOPS. The critical signals are trended over time on this display to show relationships of signals over time. If this display is left and then returned to the trended data is lost and starts the collection of data over time again. The built in system trend does not lose information on the points that are on the trend list. The system trend can be accessed with the <F7> key.

3.1.3 PLC Control. The MASFTEST strategy provides limited operator control of the PLC. Specifically, from PUMPALRM display (see Section 3.1.2.1) the operator can reset the PLC abort coil. The PLC performs comparisons of certain critical instruments with their abort limits. If one of these measurements exceeds its abort limit then the PLC abort coil is set. The directional motor or pump motor cannot run when this coil is set. This abort coil is latched, which means that if a measurement exceeds its abort limit only momentarily the abort coil will remain set even after the measurement has returned to a normal value. The only way to reset the abort coil is via the button on the abort monitoring screens mentioned above.

The MASFTEST strategy is responsible for downloading the some of the abort limits for these measurements to the PLC. This is done once upon startup of the strategy. The only exceptions to these are those limits that change based upon the pump speed. These limits are calculated in the MASFPUMP strategy and relayed to the MASFTEST strategy to be downloaded to the PLC. This occurs when a pump test has been enabled by the operator using the MASFPUMP strategy.

3.1.4 Data Logging. The MASFTEST strategy is responsible for logging data to the hard drive. The stored values are used for long-term pump monitoring and to evaluate the results of the pump tests. Currently 22 data channels are logged. These are stored in 2 history files at intervals ranging from 6 seconds to 5 minutes based on the pump active status.

The MASFTEST strategy creates these history files and assigns file names derived from the time and date the file is created. Data are logged until an even-numbered 2-hour boundary is reached (that is, 2:00, 4:00, 6:00, etc.). At this time the current set of history files is closed and a new set is opened. For details of data management refer to section 4.1.4 of this document.

3.1.5 Alarming Functions. An important function of the MASFTEST strategy is to notify the operator of significant events. This is accomplished by using the alarm features of the Genesis software. The strategy can be set up such that measurements which exceed alarm limits encoded in the strategy blocks cause an audible alarm to sound. Information about the alarm is posted to a special Genesis-provided screen called the Alarm/Event Summary Screen.

The system has been designed to produce alarms when critical pump measurements approach safety limits, when critical instruments fail, when

communications have been lost between the MASFTEST strategy and the PLC, and when the PLC has detected an abort condition.

3.2 Pump Control Function (MASFPUMP Strategy)

The pump is controlled by two variable frequency drives, one for position and one for operation. These variable frequency drives are commanded by the Genesis MASFPUMP strategy using RS-232 asynchronous communications. This strategy has logic functions that control pump position, pump operation, error checking, operation aborting, test selection, network communications, and alarming.

The following section is a description of each task performed by the MASFPUMP strategy. Details on how the task is implemented can be found in Section 4.2 of this document.

3.2.1 Position Control. The position control portion of the Genesis strategy involves several tasks operating in parallel. The desired pump position is selected by the operator or by the current phase of an automated test. The pump position is controlled by an Eaton AF5000+ frequency drive. Parameters are read and set via the Genesis AF5000 driver. The logic portion of the Genesis strategy tells the directional motor to start or stop; the direction of movement is based on the actual position feedback from the PLC.

The starting of the directional motor is controlled by automated logic and enabled by the operator. The automated logic will seek to move the pump within a desired range. When enabled, the logic will set up the direction the pump needs to move and then start the directional motor if the pump is not within the desired range.

The directional motor cannot be started if the pump motor is running. This is a safeguard to ensure equipment is not damaged. At no time are both the directional motor and the pump motor to operate at the same time.

The actual position of the pump must be outside of the desired range for the directional motor to start. If all safeguard conditions are met and the pump is directed to move by the operator, a command is sent to the Eaton AF5000+ frequency drive to start movement of the pump.

The directional motor will stop if the actual position of the pump is within the desired range; it will also stop if the actual position exceeds the limits of movement or overshoots the desired range. An abort condition will also cause the directional motor to stop. The operator can manually stop the directional motor from the console or from the stop button on the VFD control panel. If any logic conditions are met that specify halting of the directional motor, a command is sent to the Eaton AF5000+ frequency drive to stop the movement of the pump.

Communications to the Eaton AF5000+ frequency drive are enabled at all times. Parameters can only be read from and sent to the drive when the drive is powered up and receiving asynchronous communication requests. The communication

task is responsible for sending control commands and desired operating conditions to the frequency drive. Feedback status from the directional motor is displayed to the operator and is also passed to the PLC abort logic via ModBus Plus communications.

The current position of the pump is requested from the PLC. When the operator requests a position change, the actual position is compared with the desired position to determine if the directional motor should be started. After being started, it is stopped automatically when it is within range or when it overshoots the desired range. "Within range" is defined by a dead-band of 2 degrees above and below the desired position but this range is adjustable by the operator. When the pump is within this range the directional motor is not started. If the pump is out of the desired range and a request to change the position is made, the direction to move is automatically determined by the position control logic. The direction signal is then passed to the frequency drive and the directional motor is started if all critical safety checks are passed.

If for any reason a condition is preventing a successful start of the directional motor an indicator denoted by a question mark will flash on the display. By clicking on the indicator the source of the problem will be displayed to the operator.

When the directional motor is running, limit-checking on the position of the pump assures that the pump will not be moved to a position beyond the maximum bounds set for the pump position. These limits are adjustable by the operator.

The pump can be moved by operator request before or after pump motor operation. There are safeguards in place to disable pump movement during pump operation to protect equipment and test results. There is automated logic that will disable movement after the pump is within the desired range. Any time the directional motor is stopped the movement of the pump is disabled. The logic is set up so the operator must enable position control every time the pump is to be moved.

3.2.2 Pump Control. Several tasks that execute in parallel comprise the pump control. The pump is driven by a motor-controlled Eaton AF5000+ variable frequency drive. Commands to start, stop, and change speeds are processed by a Genesis AF5000 communication driver.

Abort logic is provided to ensure safe operation of the pump. Pump operating status is displayed to the operator and passed on to the PLC for abort logic and for STATION5 to data log critical signals.

An operator request will start the pump provided preventative conditions do not disallow it. An operator can start the pump from the STATION8 console if the directional motor is not operating, all permissives are satisfied, and the enable pump control bit has been set by the operator. If the start logic is satisfied, a command is sent to the Eaton AF5000+ frequency drive that controls the pump motor.

If for any reason a condition is preventing a successful start of the pump motor an indicator denoted by a question mark will flash on the display. By clicking on the indicator the source of the problem will be displayed to the operator.

The pump can be halted automatically from the elapsed test timer, an abort condition, or a manual request by an operator. The operator can halt the operation manually by selecting the stop pump button on the STATION8 console or the stop button on the VFD control panel. If the logical conditions to halt the pump motor are met, a command is sent to the Eaton AF5000+ frequency drive to stop the pump.

Communications from Genesis to the Eaton AF5000+ frequency drive which control the pump motor are enabled at all times, parameters can only be read and sent to the drive when the drive is powered up and receiving asynchronous communication requests. The MASFPUMP strategy is responsible for sending control commands and desired operating conditions to the pump motor and retrieving feedback status from the pump motor.

The current operating values in the frequency drive are compared with the desired operating values set by the operator. If the current operating parameters deviate from the desired operating parameters the operator is warned and the pump is not started. For instance, the desired pump motor speed is compared with the actual pump speed and a warning is displayed to the operator if difference is more than 5 RPM's of the desired speed. The acceleration, deceleration, and maximum speed from the pump VFD are also compared with the desired operating conditions.

The predicted motor current draw is calculated based on the desired speed of the motor and an alarm limit is set on the motor current 10 amps above this limit. The operator will be warned during pump operation if the motor current exceeds this limit. An abort limit is set 20 amps above the predicted current draw. The PLC logic will send an abort command if the motor current exceeds this limit. There is a short delay of 6 seconds after the pump is started or changes speeds before this alarm and abort logic come into effect for the motor amps.

3.2.3 Abort. The directional motor or pump motor will automatically halt operation if an abort condition becomes active from the abort coil in the PLC, a failure in AF5000+ communications, or a failure in PLC communications to STATION8 or STATION5.

There is limit-checking built into the logic used to safeguard the operation of the pump and directional motors. Feedback signals from the PLC are compared with abort limits and desired operating conditions set by the operator (directly or by test selection). Several instrument signals are also monitored by the PLC to ensure safe operating conditions. The PLC can command the mixing pump control and directional control motors to stop if any of these signals exceed their operating range. The

following is a list of instrument and motor signals that will cause the abort coil in the PLC to become active.

VR232050	Mixer pump speed high.
VR232040	Mixer pump motor amps high.
MIP00001	Moisture in pump motor oil.
TIR12A01	Mixer pump motor oil temperature A high.
TIR12A02	Mixer pump motor oil temperature B high.
TIPNO202	Pump discharge nozzle #1 temperature high.
TIPNO101	Pump discharge nozzle #2 temperature high.
ZIMPE143	Position CW limit switch.
ZIMPE144	Position CCW limit switch.
WIR12A01	Pump support column strain #1 high.
WIR12A02	Pump support column strain #2 high.
WIR12A03	Pump support column strain #3 high.
WIR12A04	Pump support column strain #4 high.

The status of the PLC communications with STATION5 and STATION8 is monitored at all times, and any time if the PLC communications fails both motors will be halted. A failure in communications with either of the AF5000+ frequency drives will also cause an abort condition which will stop both motors. If communications to the VFD's is halted it will probably be unlikely that the stop command will be successfully sent to the VFD's. This condition assumes communications has faulted and revived itself. In any case an alarm warning will be indicated to the operator that an abort condition has occurred and which one of the four sources has caused the motors to stop.

3.2.4 Test Operation. The DACS system at waste tank SY-101 uses predefined tests for pump operation. There is logic in the MASFPUMP strategy to support this feature but there is no display means to access this function. The predefined test operation is not desired for the spare pump testing and it will not be discussed in the details section.

3.2.5 Pump Bump Operation. The pump can be operated for defined period of time. The operator will determine what the pump acceleration, deceleration, and maximum speed the pump will be constrained to. The desired speed is also set by the operator along with the desired operating time. The acceleration and deceleration rates are limited to 500 RPM's maximum. The desired speed and maximum speed are limited to 1200 RPM's. The maximum pump operation time is limited to 72 hours, 59 minutes, and 59 seconds.

The test engineers set up the desired bump time and desired pump speed from a specialized display for pump bump operation which is called MASFPUMP. All data entry fields for adjusting desired operating parameters have a blue background field. There are three buttons that are enabled for selection if it is not gray. The operator must first enable a pump bump with the enable button to perform a check on current and desired conditions before pump operation can begin. When pump operation is enabled and passed all enable checks the bump pump button will become green ready for selection. At this time the operator can select to start a pump bump. At any time the operator can select the stop pump button to manually stop pump operation. If a function is disallowed a question mark indication will appear which can be selected to indicate why the function was not allowed.

When the pump is in operation two elapsed timers are used to keep track of pump operation time, one in the PLC and one in the MASFPUMP Genesis strategy. If either elapsed timer exceeds the desired operation time the pump is automatically stopped.

3.2.6 PLC Communications. PLC communications are enabled in the MASFPUMP strategy for several functions. One is to receive the actual position of the pump to be used in the position pump logic. Also the PLC abort coil status is read into the strategy to stop either motor and disallow the start of a motor if it is active. The desired operating parameters and abort levels that are set in the MASFPUMP strategy are sent to the PLC logic to be used for logic. The current values of the critical variables from the VFD's are also sent to the PLC for abort logic and to be transferred to the MASFTTEST strategy for display on STATION5.

3.2.7 Alarming. The test engineers are warned of signals that exceed limits and the status of events with the alarming function of Genesis. When an alarm condition arises the computer drives an amplified audible alarm and the tag name of the signal that caused it is displayed in the lower right corner of the display. A history of alarm conditions can be viewed from the alarm summary.

The alarms set in the motor strategy pertain mostly to the pump motor and the directional motor. There are some additional signals that are received from the PLC that are also alarmed.

Operator activity is also tracked in the alarm/event summary. If a value is changed by the operator, a record of the change is logged into the alarm/event summary.

3.2.8 System Parameters. There are special algorithm functions in the MASFPUMP strategy that are used to execute Report & Recipe code, and for version tracking. Please refer to Section 4.2.8 of this document for details on these functions.

3.3 Modicon PLC Functions

The functions of the Modicon PLC are to input data from the field, to abort the pump or position motor when critical channels are beyond their abort limits, to provide control and alarm signals and the logic to generate them, to provide timers and enable logic for pump testing, and to provide data and status information to Genesis. Each of these are discussed functionally in the following sections. The details are in Section 4.3.

3.3.1 Data Collection from the Field. Data enter the PLC via any of a number of Modicon input modules. Different types of modules can accept analog voltage or current inputs, thermocouple inputs, digital inputs of varying levels communications data sharing to the Genesis strategies.

In order to access data from a module, it must be entered into the PLC configuration table known as the Traffic Cop. This involves specifying the module's type, physical location, and the PLC registers which will be used for communication with the module. The physical location is specified in terms of the Modicon I/O drop, the I/O rack within the drop, and the slot within the rack which contains the module.

For most types of modules, this is all that needs to be done in order to have access to the data. The PLC I/O hardware places the data into the specified registers. From there, the contents of the registers can be sent to Genesis (see Section 3.1.1.1) and can be used within the PLC if further logic operations on the data are required.

3.3.2 Abort Functions. The PLC is responsible for providing an automatic pump shutoff signal (known as the abort signal) whenever certain safety-related or other critical measurements exceed predetermined limits. This function is provided in the PLC rather than in Genesis since the response time of the PLC is much faster (on the order of 50 ms).

The abort limits are sent to the PLC from Genesis (see Section 3.1.5). The PLC then continually compares the incoming critical measurements to their abort limits and sends the abort signal to the Genesis strategies if any of the limits are exceeded. The MASFPUMP strategy is responsible for stopping the VFD's through serial communications if the abort coil becomes active.

3.3.3 Test Timer and Enable Logic. The PLC contains a timer which times the pump operation. The time allowed for the test is sent from Genesis. The PLC timer then runs whenever the pump is running. This provides a backup means for shutting off the pump when the allowed time for the test has elapsed. In most cases, the operator or the MASFPUMP strategy will have already shut off the pump before the allowed time has elapsed in the PLC.

The PLC also contains test enable logic. This is a logic mechanism which ensures that all of the timers are set and abort parameter changes are accomplished before the pump is run.

3.3.5 Special Data and Status Information. In most cases, data can be made available to Genesis without any further PLC logic other than the module configuration setup (see Section 3.3.1). However, some PLC logic is needed to extract data or status information to be sent to Genesis. The status information provides information about the I/O drop and module status. By extracting only the information needed in the PLC the amount of I/O between the PLC and Genesis can be reduced.

Also, there is PLC logic which monitors the high-frequency strain alarms for momentary triggers which may otherwise occur too fast to cause an alarm in Genesis.

3.4 Instrumentation

MiniDACS instrumentation provides measurements mainly for mixer pump operation.

Data enter the MiniDACS via one of four general methods. Knowledge of the method used is necessary in order to determine the resolution of the data.

Most of the analog measurements enter the MiniDACS through Modicon I/O modules which are set up to receive signals ranging from 4-20 mA, 1-5 volts, or 0-5 volts. These modules digitize the signals to a resolution of 12 bits. The range column of the I/O list gives the corresponding range in engineering units. This represents the full range of the input signal. The engineering unit range is used to scale the digitized input, and this scaled value is recorded to disk, which is performed by Genesis. The useful range does not always correspond to the full range. In some cases, there is an entry in the sub-range column of the channel list which specifies the useful range. If the digitized input signal falls outside of the sub-range, the recorded value of the measurement will be pegged at one or the other boundaries of the subrange.

Data from the variable speed drives (speed, current, and voltage) enter the MiniDACS via the AF5000 device driver operating in the MASFPUMP strategy. This is the only category of data which does not enter the PLC via I/O modules.

3.4.1 Mixer Pump Operation Measurements. MiniDACS provides measurements which monitor the mixer pump operation. There are measurements for the operating characteristics of the pump motors.

3.4.1.1 Mixer Pump Motor Operation. These measurements provide information about the operating state of the mixer pump motor and the pump directional motor. Most of these measurements originate with the variable speed drive and first enter the MASFPUMP strategy over the RS-232 link. There are 12 measurements giving the motor speed (RPM), the motor voltage, current, percent of load voltage frequency and set-point speed for each motor.

In addition there are measurements for mixer pump motor oil temperature and directional motor position which enter via the Modicon PLC. There are also digital signals which detect moisture in the pump motor oil and when the pump rotational position is at one of its limits.

3.4.1.2 Discharge Nozzle and Pump Column. DACS provides a set of measurements for detecting the motion and characteristics of the waste as it moves through the mixer pump. These include measurements for discharge nozzle waste temperature and pressure and pump column pressure.

3.4.2 Strain Measurements. There are measurements which provide strain readings for the pump column. There are a total of 4 low-frequency strain measurements for the pump column. There is also one pump column vibration measurement.

4.0 DESIGN DETAILS

This section presents the details of the MiniDACS design. It includes a discussion of the MASFTEST strategy, the MASFPUMP strategy, and the PLC, focusing upon how each of these accomplishes their various tasks.

4.1 Instrument Monitoring and Data Collection Function (MASFTEST Strategy)

In Section 3.1, the functions of the MASFTEST strategy were discussed, including communications with the Modicon PLC, data and status monitoring, alarm generation, data logging, and PLC control. In this section, the details of how these functions are accomplished will be presented.

Some of these functions are accomplished by the MASFTEST strategy blocks, some by the display screens, and some via built-in features of the Genesis system. For those functions that are accomplished via strategy blocks, sample portions of the strategy are shown and explained in the following sections.

4.1.1 Communications. The MASFTEST strategy communicates with the Modicon PLC and with the other stations on the Gen-Net network. The following is a discussion of the details of each of these.

4.1.1.1 Communications between MASFTEST Strategy and the Modicon PLC. The MASFTEST strategy communicates with the Modicon PLC via specialized multi-drop ModBus Plus communications link. The communication the function is performed by an SA85 Modicon card in STATION5.

Communications between Genesis and the PLC is accomplished via two device blocks, called DEV 1 and DEV 2. DEV 1 is set to scale 12-bit raw data (0-4095) and DEV 2 is set to scale 16-bit raw data (0-65535). The Modicon PLC uses 16-bit registers, but most of the data from the input modules are 12-bit data. In general, DEV 1 is used for most data, and DEV 2 is used when a full 16-bit PLC register is to be transferred.

Each device block has 16 groups that can be set up to accomplish a mapping between PLC registers and Genesis I/O blocks. For each group to be used, one must specify the type of Genesis I/O block to be connected, the type of PLC register, the starting PLC register address, and the number of connection points within the group. The Genesis I/O block types available are *AIN*, *AOUT*, *DIN*, *DOU*, *PAIN*, *PAOT*, *PAIO*, *PDIN*, *PDOUT*, and *PDIO*. In the above terminology "A" stands for analog, "D" for digital, "P" for packed, "IN" for input, "OUT" for "OT" for output, and "IO" for bi-directional input output. The PLC registers available are: CS (Coil/Status bits - Oxxx),

IS (Input/Status Bits - 1xxxx), IR (Input Registers - 3xxxx), and HR (Holding Registers - 4xxxx). The starting address specifies the xxxx part of the above registers.

The Genesis I/O block and the PLC register type must be compatible.

Coil/Status and Input/Status registers must be paired with digital input or output blocks. Input registers must be paired with analog input blocks, and holding registers can be paired with either analog or digital input or output blocks.

The amount of data that can be transferred within one group depends upon the type of I/O block and PLC register that is used. Each group can have up to 16 connections (numbered 0-15). Non-packed blocks transfer one register or one bit per connection depending on whether the block is analog or digital. Packed blocks can transfer 128 (16*8) analog registers or 256 (16*16) digital bits. These bits could be 256 coil/status (0xxxx) bits or 16 holding registers (4xxxx) interpreted digitally. Packed communication is much more efficient and should be used whenever possible.

Following is the allocation of communications to registers in the PLC from the MASFTTEST strategy.

Table I. PLC register allocation to MASFTTEST strategy.

PLC REGISTER	TAGNAME	DESC	BLOCK_TYPE
213	WDTRESET	WATCH DOG TIMER FROM GENESIS	DIGITAL OUTPUT
241	RSTCOIL	RESET ABORT COIL	DIGITAL OUTPUT
236-251	G7C1		PAK DIGITAL I/O
243	G7C1.DO8	BUMP TIME REACHED DESIRED TIME	PAK DIGITAL I/O
250	COMABRT	PLC COMMUNICATIONS FAILURE	DIGITAL OUTPUT
252-267	G7C2		PAK DIGITAL I/O
253	G7C2.DO2	MIP00001 ABORT	PAK DIGITAL I/O
254	G7C2.DO3	ZIMPE143 ABORT	PAK DIGITAL I/O
255	G7C2.DO4	ZIMPE144 ABORT	PAK DIGITAL I/O
256	G7C2.DO5	WIR12A01 LOW ABORT	PAK DIGITAL I/O
262	G7C2.DO11	WIR12A02 LOW ABORT	PAK DIGITAL I/O
263	G7C2.DO12	WIR12A03 LOW ABORT	PAK DIGITAL I/O
300-315	G5C0		PAK DIGITAL I/O
300	G5C0.DO1	DISCHARGE NOZZLE #2 TEMP ABORT	PAK DIGITAL I/O
303	G5C0.DO4	DISCHARGE NOZZLE #1 TEMP ABORT	PAK DIGITAL I/O
306	G5C0.DO7	PUMP MOTOR OIL TEMP A ABORT	PAK DIGITAL I/O
307	G5C0.DO8	PUMP MOTOR OIL TEMP B ABORT	PAK DIGITAL I/O
313	G5C0.DO14	WIR12A01 HIGH ABORT	PAK DIGITAL I/O

314	G5C0.DO15 WIR12A02 HIGH ABORT	PAK DIGITAL I/O
315	G5C0.DO16 WIR12A03 HIGH ABORT	PAK DIGITAL I/O
316-331	G5C1	PAK DIGITAL I/O
316	G5C1.DO1 WIR12A04 HIGH ABORT	PAK DIGITAL I/O
325	G5C1.DO10 HIGH PUMP MOTOR CURRENT ABORT	PAK DIGITAL I/O
326	G5C1.DO11 HIGH PUMP MOTOR SPEED ABORT	PAK DIGITAL I/O
331	G5C1.DO16 WIR12A04 LOW ABORT	PAK DIGITAL I/O
332-347	G5C2	PAK DIGITAL I/O
341	G5C2.DO10 ZIMPE142 LOW GAS PRESS. ABORT	PAK DIGITAL I/O
540-555	G8C0	PAK DIGITAL I/O
542	TZPNO202 INSTRUMENT PROBLEM - TIPNO202	OR
543	TZPNO101 INSTRUMENT PROBLEM - TIPNO101	OR
545	TZR12A01 INSTRUMENT PROBLEM - TIR12A01	OR
546	PYR12A01 INSTRUMENT PROBLEM - PIR12A01	OR
547	TZR12A02 INSTRUMENT PROBLEM - TIR12A02	OR
549	WZR12A02 INSTRUMENT PROBLEM - WIR12A02	OR
553	WZR12A01 INSTRUMENT PROBLEM - WIR12A01	OR
554	WZR12A03 INSTRUMENT PROBLEM - WIR12A03	OR
556-571	G8C1	PAK DIGITAL I/O
556	WZR12A04 INSTRUMENT PROBLEM - WIR12A04	OR
561	G8C1.DO6 INSTRUMENT PROBLEM - SPARE2	OR
562	G8C1.DO7 INSTRUMENT PROBLEM - SPARE1	OR
563	ZZIMPE142 INSTRUMENT PROBLEM - ZIMPE142	OR
564	G8C1.DO9 INSTRUMENT PROBLEM - PN2PO506	OR
565	G8C1.DO10 INSTRUMENT PROBLEM - PN2PO507	OR
566	G8C1.DO11 INSTRUMENT PROBLEM - MPICTC01	OR
567	G8C1.DO12 INSTRUMENT PROBLEM - PITNO110	OR
568	G8C1.DO13 INSTRUMENT PROBLEM - PITNO111	OR
569	G8C1.DO14 INSTRUMENT PROBLEM - XIR12AN1	OR
570	G8C1.DO15 INSTRUMENT PROBLEM - ZIMPE112	OR
2001-2016	G2C0	PAK DIGITAL INP
2015	ZIMPE144 MIX PUMP POS. LIMIT SWITCH CCW	DIGITAL INPUT
2016	ZIMPE143 MIX PUMP POS. LIMIT SWITCH CW	DIGITAL INPUT

2017-2032	G2C1		PAK DIGITAL INP
2017	MIP00001	MOISTURE IN PUMP MOTOR OIL 1	DIGITAL INPUT
2033-2048	G2C2		PAK DIGITAL INP
2034	PMPINRUN	PUMP IN RUN SIGNAL	DIGITAL INPUT
2042	ABRTCOIL		DIGITAL INPUT
2043	PLCBEN	LATCHED BUMP ENABLE FROM PLC	DIGITAL INPUT
2044	PLCWD	WATCH DOG FROM PLC	NOT
2045	ST8COMFA	STATION8 COMM FAILURE ALARM	DIGITAL INPUT
2046	PLCOK	1 - PLC OK; 0 - PLC PROBLEM	DIGITAL INPUT
2047	A5ABORT	PUMP PROBLEM ALARM	DIGITAL INPUT
2048	ST5COMFA		DIGITAL INPUT
2049-2064	G2C3		PAK DIGITAL INP
2049	PMCALARM	PUMP MOTOR CURRENT ALARM	DIGITAL INPUT
2051	PSPALARM	PUMP SPEED ALARM	DIGITAL INPUT
40108	H3C0	DROP 2 RACK 1 I/O HEALTH	PAK DIGITAL INP
40108	H3C0.DO13	DROP 2 RACK 1 SLOT 4	PAK DIGITAL INP
40108	H3C0.DO11	DROP 2 RACK 1 SLOT 6	PAK DIGITAL INP
40109	H3C1	DROP 2 RACK 2 I/O HEALTH	PAK DIGITAL INP
40109	H3C1.DO16	DROP 2 RACK 2 SLOT 1	PAK DIGITAL INP
40109	H3C1.DO15	DROP 2 RACK 2 SLOT 2	PAK DIGITAL INP
40109	H3C1.DO14	DROP 2 RACK 2 SLOT 3	PAK DIGITAL INP
40110	H3C2	DROP 1 RACK 1 I/O HEALTH	PAK DIGITAL INP
40110	H3C2.DO11	DROP 1 RACK 1 SLOT 6	PAK DIGITAL INP
40200-40207	G4C0		PAK ANALOG OU
40205	HILIM	SET TO 4095	ANALOG INPUT
40206	HPMOTLIM	HIGH MOTOR OIL TEMP ABORT LIM	ANALOG INPUT
40224-40231	G4C3		PAK ANALOG OU
40224	HPCSLIM	PUMP COLUMN STRAIN ABORT LIMIT	ANALOG INPUT
40232-40239	G4C4		PAK ANALOG OU
40234	HTEMPLIM	HIGH NOZZLE TEMP ABORT LIMIT	ANALOG INPUT
40238	LPCSLIM	PUMP COLUMN STRAIN ABORT LIMIT	ANALOG INPUT
42001-42008	G1C0		PAK ANALOG INP
42001	TIPNO101	MIX PUMP DIS. NOZ. 2 TEMP 1	ANALOG INPUT

42003	TIR12A02	PUMP MOTOR OIL TEMPERATURE B	ANALOG INPUT
42004	TIR12A01	PUMP MOTOR OIL TEMPERATURE A	ANALOG INPUT
42006	ZIMPE142	PUMP COLUMN N2 PRESSURE	ANALOG INPUT
42007	PIR12A01	VOLUTE PRESSURE	ANALOG INPUT
42008	TIPNO202	MIX PUMP DIS. NOZ. 1 TEMP 1	ANALOG INPUT
42017-42024	G1C2		PAK ANALOG INP
42017	PITNO111	PUMP DISCHARGE NOZZLE #1 PRESS	ANALOG INPUT
42018	PITNO110	PUMP DISCHARGE NOZZLE #2 PRESS	ANALOG INPUT
42019	PN2PO506	MIXER PUMP SHROUD N2 PRESSURE	ANALOG INPUT
42020	PN2PO507	MIXER PUMP LEG N2 PRESSURE	ANALOG INPUT
42021	MPICTC01	MIXER PUMP INSTR. CABINET TEMP	ANALOG INPUT
42022	SPARE2	SPARE2	ANALOG INPUT
42023	SPARE1	SPARE1	ANALOG INPUT
42065-42072	G1C8		PAK ANALOG INP
42070	XIR12AN1	PUMP CASING VIBRATION	ANALOG INPUT
42071	WIR12A04	PUMP SUPPORT COLUMN STRAIN #4	ANALOG INPUT
42073-42080	G1C9		PAK ANALOG INP
42073	WIR12A01	PUMP SUPPORT COLUMN STRAIN #1	ANALOG INPUT
42074	WIR12A03	PUMP SUPPORT COLUMN STRAIN #3	ANALOG INPUT
42080	WIR12A02	PUMP SUPPORT COLUMN STRAIN #2	ANALOG INPUT
42129-42136	H2C0		PAK ANALOG INP
42131	ZIMPE112	MOTOR POSITION ENCODER BCD	ANALOG INPUT
42217-42224	H2C11		PAK ANALOG INP
42219	PLCPDPAL	PUMP DISCHARGE PRESS ALARM LIM	ANALOG INPUT
42220	PLCPDPAB	HI PUMP DISCHARGE PRESS ABTLIM	ANALOG INPUT
42221	PLCPSLIM	PUMP SPEED LIMIT FROM PLC	ANALOG INPUT
42222	PLCSPDAL	PUMP SPEED ALARM LIMIT	ANALOG INPUT
42225-42232	H2C12		PAK ANALOG INP
42225	VR232050	PUMP SPEED	ANALOG INPUT
42226	VR232080	ROTATIONAL MOTOR VOLTAGE	ANALOG INPUT
42227	VR232100	ROTATIONAL MOTOR CURRENT	ANALOG INPUT
42228	VR232110	ROTATIONAL MOTOR SPEED	ANALOG INPUT
42229	VR232040	PUMP MOTOR CURRENT	ANALOG INPUT

42230	VR232020	MIXER PUMP MOTOR VOLTAGE	ANALOG INPUT
42231	PLCPMCAB	HIGH PUMP MOTOR CURRENT ABRT L	ANALOG INPUT
42232	PLCPMCAL	PUMP MOTOR CURRENT ALARM VALUE	ANALOG INPUT

Figure 3 shows a portion of the PLC I/O section of the STATION5 strategy. For efficient communications, most I/O is done via packed blocks. The packed blocks are connected to the device block. To allow each channel to have its own tag name and description, regular A/I/V blocks are connected to the packed blocks as shown in the figure. The I/O blocks are (with few exceptions) organized by device block group such that each horizontal row in the PLC I/O area contains the I/O for one device block group starting with Group 1 at the top.

Fig. 3. PLC I/O strategy detail.

The packed blocks are named to reflect their device block group and connection number within the group. Thus, the *PAIN* block *G1C0* is connected to Group 1, connection 0 of device block 1. The packed blocks connected to device 1 are named beginning with the letter "G." Those connected to device 2 begin with the letter "H." Thus, a block called "H6C3" would be connected to Group 6, connection 3 of device block 2.

The regular A/I/V blocks connected to the packed blocks are arranged by connection number of the packed block starting at the upper left and reading down. Thus, in the figure above, *TIPNO101* is connection 1, *TIR12A02* is connection 3, *TIR12A01* is connection 4, *ZIMPE142* is connection 6, *PIR12A01* is connection 7,

TIPNO202 is connection 8, and connections 2 and 5 are empty. This convention has been followed throughout.

The *PAIN* blocks include range information for the incoming raw values that allow them to be scaled to engineering units. This scaling information is duplicated in the *AIN* blocks. In addition, the *AIN* blocks are configured to include the engineering units, the measurement description, alarm values (if any), and scan period.

The scan period specifies the time between measurement updates. Genesis only allows scan periods of 0.05, 0.1, 0.25, 0.5, 1, 2, 6, 12, and 30 seconds. However, the scan period actually achievable depends upon the number of blocks in the system and the communication rate with the PLC. In addition, the overall communication scan period for each communication link must be specified. The scan rates of individual blocks cannot exceed the overall communication scan rate. The communication link with the PLC is currently set to a 0.5 second scan period. Most of the measurements are set for 0.5, 1, or 6 second scan periods.

There are two cases where additional manipulation is needed to present the data in engineering format.

4.1.1.2 Other Network Communications. The MASFTEST strategy communicates over the ArcNet to RSS stations for remote screen display which is the function of STATION7. The details of the ArcNet configuration can be found in Section 4.4.

4.1.2 Data Monitoring. The data and status monitoring functions of the MASFTEST strategy are accomplished by displaying information to the operators on any of a number of displays including a Genesis-provided system runtime trend and history display. In addition to providing the monitoring function, some displays allow the operator to input control signals that can initiate processes in Genesis or ultimately in the PLC. In addition, all displays have a button which, when clicked on with the mouse, allow other displays to be brought up on that particular monitor.

Displays can be brought up independently on the STATION5 or STATION7 computers in the MiniDACS system. All data that travel to and from the remote displays (in RSS stations) go through the master computer (STATION5) via ArcNet.

There are four main monitoring displays that can be selected from the main menu display. Following is a list of displays with the purpose of each display.

Table II. Displays for MASFTEST strategy.

Name	Function
IOSTATUS	Monitor I/O health status

MENU	Legend of all displays for operators to select
PUMP	Mixer pump current values
PUMPALRM	Critical signals alarm and abort status
PUMPOPS	Pump operations 2 minute trend of critical variables

All of the displays have a similar header bar. The header bar has the title, the current time and date, the application name and version number, and a button to allow the user to bring up the Main Menu. The displays have been designed so that anything in blue can be clicked on with the mouse. These are either buttons that bring up another display or measurement values that bring up a tag details sub-window. The tag details sub-window appears at the bottom of the display and gives further information about the measurement.

Genesis provides two other facilities useful for data monitoring. One is the system runtime trend. This allows the display of runtime graphs for up to 20 predefined measurements. These differ from the runtime trend screens discussed above in that the prior data are not lost when the display is exited momentarily.

Additionally, Genesis provides the ability to examine, graphically or in tabular format any data that are being logged to a history file on the current computer. STATION5 is the only computer that has history files available, so this feature only works on STATION5. Data logging will be discussed further in Section 4.1.4.

4.1.3 PLC Control. The MASFTTEST strategy provides limited control of the PLC. Primarily, it allows the operator to reset the PLC's abort coil. This function was discussed in Section 4.1.2 and the strategy logic to accomplish it will be shown and discussed in Section 4.1.5.

The MASFTTEST strategy is also responsible for downloading the abort limits to the PLC. These are the values that the PLC will compare the incoming measurement value with to determine if an abort condition exists. The abort limits are sent via *A/N* blocks located in the PLC I/O section of the strategy. These *A/N* blocks get their values from a report SETLIMS.RPS, which contains the actual abort limit values. This report is run at startup to load the *A/N* blocks with the abort limit values.

Figure 4 show the startup logic. It shows the mechanism for generating a pulse immediately upon startup as well as a delayed startup pulse. This is implemented by connecting output of the ON *DIN* block to the PULON pul block and the DELAYON TON block. The ON block is wired to always be 1. Since at startup, the inputs of all blocks are initialized to 0, the only time the PULON and DELAYON blocks will see a 0 to 1 transition on their inputs is at startup. This will trigger the *pul* block

PULON and cause the TON block DELAYON to produce its output after the its programmed 45-second delay elapses.

Fig. 4. Startup logic.

The *PULON* block initiates the history file naming the phasing process that was discussed in Section 4.1.4. The *TON* block *DELAYON* is the block that runs the *DOWNLIMS* report via the *DOWNLIMS REPORT* block. The 45-second delay is necessary to allow time for Genesis to PLC communication to be established before the abort limits are downloaded.

4.1.4 Data Logging. The MASFTEST strategy is responsible for logging data to the hard disk and sending the data files over the network to the archiving computer.

The data logging portion is accomplished in Genesis by the use of *HIST* blocks. The files are known in Genesis terminology as history files. Figure 5 shows an overall view of the MASFTEST strategy history/data logging section. More detailed views of portion of this strategy section are shown later.

Fig. 5. History data logging overall view.

The top two blocks of the right most column in the diagram above are the *HIST* blocks. The remainder of the blocks are involved with timing the creation of the history files, phasing the creation of the files and logging of the data to avoid system overload and naming the files.

The functionality of this section of the strategy is by column, and the general flow of the logic is left to right. The left most column consists of *TIMER* blocks controlling the timing of the opening and closing of the history files. These feed into two *OR* blocks that feed into a *REPORT* block. The *REPORT* block runs a report

(HISTFNAM) that creates file names for the about-to-be-opened history files based upon the date and time.

When this process is complete the report sets the *pul* block, the next block to the right above. This block generates a pulse that causes the *SHOT* block (the next one over) to generate a one-shot pulse. This pulse starts the *TON* blocks (the next column of 2 blocks). It is detrimental to start all the history blocks at the same time, so for this reason, the *TON* (timer-on-delay) blocks lie in-line with every history block. Each *TON* block has a different delay, spreading the load on the hard disk drive over the total time interval. These delay timer blocks are set to produce their outputs at varying times from the start of the one-shot pulse. They implement the phased stopping and starting of the history files by feeding into the start and stop inputs of the *HIST* blocks, the right most column of blocks.

Figure 6 shows a portion of the history strategy section that initiates a history file changeover. The system is designed to produce history files that contain 2 hours worth of data each. Every 2 hours throughout the day, the current set of history files is closed a new set is opened. The timer blocks are set to create a pulse at a specific time of day. In this case, the timer blocks are set to create their pulses on the hour spaced 2 hours apart. When one of the timers goes off, the signal feeds through the *OR* block and causes the report HISTFNAM to be run.

Fig. 6. Timer, report, and pulse portion of history strategy section.

This report implements the history file-naming convention. The files are named "ymdhFFFF.PRN," where

y is the year, with 2=1992, 3=1993, etc.
 m is the month, numbered 1-9 and A-C
 d is the day, numbered 1-9 and A-V
 h is the hour, numbered 0-9 and A-N, and
 FFFF is the file code that can be any one to four alphanumeric characters.

HISTFNAM reads the system time/date and creates these file names. It loads the file name field of the *HIST* blocks with the new file name. It then sets the *PUL* block GO which in turn initiates the one-shot pulse from the *SHOT* block XFERPULS. The HISTFNAM report is run at system startup.

Table III. History file allocation of signals.

<u>HIST BLOCK</u>	<u>SAMPLE RATE</u>	<u>FILE NAME</u>	<u>TAG</u>	<u>VAR</u>
PUMP	300/6 SECONDS	????PUMP	MPICTC01	OUT
PUMP	300/6 SECONDS	????PUMP	PIR12A01	OUT
PUMP	300/6 SECONDS	????PUMP	PITNO110	OUT
PUMP	300/6 SECONDS	????PUMP	PITNO111	OUT
PUMP	300/6 SECONDS	????PUMP	PN2PO506	OUT
PUMP	300/6 SECONDS	????PUMP	PN2PO507	OUT
PUMP	300/6 SECONDS	????PUMP	TIPNO101	OUT
PUMP	300/6 SECONDS	????PUMP	TIPNO202	OUT
PUMP	300/6 SECONDS	????PUMP	TIR12A01	OUT
PUMP	300/6 SECONDS	????PUMP	TIR12A02	OUT
PUMP	300/6 SECONDS	????PUMP	XIR12AN1	OUT
PUMP	300/6 SECONDS	????PUMP	ZIMPE112	OUT
PUMP	300/6 SECONDS	????PUMP	ZIMPE142	OUT
PUMP	300/6 SECONDS	????PUMP	VR232020	OUT
PUMP	300/6 SECONDS	????PUMP	VR232040	OUT
PUMP	300/6 SECONDS	????PUMP	VR232050	OUT
PUMP	300/6 SECONDS	????PUMP	SPARE1	OUT
PUMP	300/6 SECONDS	????PUMP	SPARE2	OUT
STRAIN	300/6 SECONDS	????STRN	WIR12A01	OUT

STRAIN 300/6 SECONDS ????STRN WIR12A02 OUT
 STRAIN 300/6 SECONDS ????STRN WIR12A03 OUT
 STRAIN 300/6 SECONDS ????STRN WIR12A04 OUT

4.1.5 Alarming Functions. Operators are notified of significant events by using the alarm capabilities of the Genesis software. Genesis provides a special screen called the alarm/event summary screen. Alarms, operator actions, and other system events are posted to this screen as they occur. In addition, the PC speaker sounds when an alarm arrives. These speakers have been amplified in the trailer producing an effective audible alarm. The operator must hit a keyboard key to silence the alarm. Information about the alarm can be found on the alarm/event summary screen. From there the alarms can be acknowledged by the operator.

Following is a table of tags that are enabled for alarming in the MASFTTEST strategy.

Table IV. Algorithm blocks enabled for alarming.

<u>Tagname</u>	<u>Description</u>	<u>Block Type</u>
A5ABORT	PUMP PROBLEM ALARM	DIGITAL INPUT
ABRTCOIL		DIGITAL INPUT
G5C0		PAK DIGITAL I/O
G5C1		PAK DIGITAL I/O
G7C2		PAK DIGITAL I/O
G8C0		PAK DIGITAL I/O
G8C1		PAK DIGITAL I/O
H3C0	DROP 2 RACK 1 I/O HEALTH	PAK DIGITAL INPUT
H3C1	DROP 2 RACK 2 I/O HEALTH	PAK DIGITAL INPUT
H3C2	DROP 1 RACK 1 I/O HEALTH STATUS	PAK DIGITAL INPUT
MIP00001	MOISTURE IN PUMP MOTOR OIL 1	DIGITAL INPUT
MPICTC01	MIXER PUMP INSTR. CABINET TEMP	ANALOG INPUT
PLCFAIL	FAILURE OF PLC COMMUNICATIONS	DIGITAL INPUT
PLCOK	1 - PLC OK; 0 - PLC PROBLEM	DIGITAL INPUT
PMCALARM	PUMP MOTOR CURRENT ALARM	DIGITAL INPUT
PN2PO506	MIXER PUMP SHROUD N2 PRESSURE	ANALOG INPUT
PN2PO507	MIXER PUMP LEG N2 PRESSURE	ANALOG INPUT

PSPALARM	PUMP SPEED ALARM	DIGITAL INPUT
ST5COMFA		DIGITAL INPUT
ST8COMFA	STATION8 COMM FAILURE ALARM	DIGITAL INPUT
TIPNO101	MIX PUMP DIS. NOZ. 2 TEMP 1	ANALOG INPUT
TIPNO202	MIX PUMP DIS. NOZ. 1 TEMP 1	ANALOG INPUT
TIR12A01	PUMP MOTOR OIL TEMPERATURE A	ANALOG INPUT
TIR12A02	PUMP MOTOR OIL TEMPERATURE B	ANALOG INPUT
TZPNO101	INSTRUMENT PROBLEM - TIPNO101	OR
TZPNO202	INSTRUMENT PROBLEM - TIPNO202	OR
TZR12A01	INSTRUMENT PROBLEM - TIR12A01	OR
TZR12A02	INSTRUMENT PROBLEM - TIR12A02	OR
WIR12A01	PUMP SUPPORT COLUMN STRAIN #1	ANALOG INPUT
WIR12A02	PUMP SUPPORT COLUMN STRAIN #2	ANALOG INPUT
WIR12A03	PUMP SUPPORT COLUMN STRAIN #3	ANALOG INPUT
WIR12A04	PUMP SUPPORT COLUMN STRAIN #4	ANALOG INPUT
WZR12A01	INSTRUMENT PROBLEM - WIR12A01	OR
WZR12A02	INSTRUMENT PROBLEM - WIR12A02	OR
WZR12A03	INSTRUMENT PROBLEM - WIR12A03	OR
WZR12A04	INSTRUMENT PROBLEM - WIR12A04	OR
ZIMPE142	PUMP COLUMN N2 PRESSURE	ANALOG INPUT
ZIMPE143	MIX PUMP POS. LIMIT SWITCH CW	DIGITAL INPUT
ZIMPE144	MIX PUMP POS. LIMIT SWITCH CCW	DIGITAL INPUT
ZZMPE142	INSTRUMENT PROBLEM - ZIMPE142	OR

The ABRTCOIL block comes from the PLC Abort Coil. When set due to an abort detected in the PLC, an alarm is generated in Genesis, which notifies the operator. Alarms are generated in Genesis for each individual abort in the PLC. Since any of a number of signals could have caused the PLC abort, this allows the operator to determine which signal specifically was the cause of the abort.

Since the PLC abort coil remains latched following an abort, the operator needs some means of resetting the coil after the problem has been resolved. This is provided by the PULCOIL and RSTCOIL blocks shown above. When the Reset Abort Coil buttons on the abort coil status screens (see Section 4.1.2) are clicked upon, they cause the PULCOIL to produce a pulse. This is sent via the RSTCOIL digital output

block to the PLC where it causes a reset of the PLC abort coil, as well as all of the individual aborts in the PLC.

The PLCCOMFA block is set when Genesis detects a communication failure from the PLC to Genesis. This can be detected by the Modicon driver and accessed by a connection to the FAIL bit of an I/O block. The PLCCOMFA block causes a Genesis alarm whenever this condition occurs. It also attempts to send this information to the PLC so that the abort coil can be set. This is accomplished via the COMABRT block shown above. This is useful in the unlikely event that the communication failure has been only one way and the PLC has not detected a corresponding Genesis to PLC failure.

The A5ABORT block is set when the MOTOR strategy detects a problem with the AF5000 motor controller. This also causes a Genesis alarm and is sent to the PLC (via the A5ABRT block) so it can set its abort coil.

4.2 PUMP CONTROL FUNCTION

The signals that actually control the pump are assigned by the Eaton AF5000+ variable frequency drives. There is one drive to control the motor that positions the pump and one drive to control the motor that operates the pump. These variable frequency drives receive commands in the form of ASCII strings from a communication driver. This ASCII driver is imbedded in the Genesis MASFPUMP strategy and is represented by two AF5000+ hardware communication device blocks, one for each VFD.

There are several different tasks that are performed in parallel to control the position and operation of the pump. The results of these tasks are sent as commands to the variable frequency drives or as indications to the operators. The following subsections of Section 4.2 supply the details of how the separate tasks of position control, pump control, aborting, test operation, and pump bump operation are implemented in the MOTOR strategy. These will be followed by discussions of PLC communications, alarms, system parameters, and indication of failure of executing tasks.

4.2.1 Position Control. The following are the details related to controlling the position (that is, direction) of the pump.

4.2.1.1 Start. The directional motor can move the pump only if the actual position is outside the desired range, the actual position is within the safe boundary, the pump is not running, and the operator enables the pump to move. The following tags of the MASFPUMP strategy are used to execute the start of the directional motor. Table V. Position control start variables.

ABORTOR
BACKWARD
DISMOVE
DMOTOR
FORWARD
FSTRTDEL
GOFORWRD
GOREVERS
HILIMAND
LOLIMAND
NOTRUN
POSCNTRL
POSITION
PRUN
PSTOP
RSTRTDEL
START
STARTAND
STARTSHT
STRTAND

When the output of the *one shot* block <STARTSHT> goes high, the directional motor will be commanded to start by setting <DMOTOR.start> high. <STARTSHT> is set high when the output of the *small logic and* block <STARTAND> goes high. <STARTAND> and <STRTAND> are used as the safeguard to disable a start of movement under improper conditions. All of the following conditions must be true before the directional motor can be started.

- <ABORTOR.QNOT> is high if no abort condition is active.
- <START.DOUT> is high indicating a start request is active from the direction control logic.
- <HILIMAND.QNOT> is high indicating the position of the pump is not beyond the maximum boundary.

- <LOLIMAND.QNOT> is high indicating the position of the pump is not beyond the minimum boundary.
- <DISMOVE.QNOT> is high indicating position control is not disabled.
- <PSTOP.DOUT> is high indicating that pump motor is stopped.
- <PRUN.QNOT> is high indicating the pump motor is not running.

The *small logic* or block <START> is the block that will go high when the directional motor is successfully requested to move. <START> has two inputs to move the pump forward or backward.

- <FSTRTDEL.DOUT> goes high when the pump is to move in the forward direction. <FSTRTDEL> will go high when both of the following inputs are true.
 - <GOFORWARD.DOUT> which goes high when the pump is to go forward.
 - <DMOTOR.forward> is high when the position motor is set to move in the forward direction.
- <RSTRTDEL.DOUT> goes high when the pump is to move in the reverse direction. <RSTRTDEL> will go high when both of the following inputs are true.
 - <GOREVERS.DOUT> which goes high when the pump is to go backward.
 - <DMOTOR.reverse> is high when the position motor is set to move in the reverse direction.

The actual pump position is monitored from the PLC and is passed to the block called <POSITION> in STATION8. The output of the block <POSITION> is passed to the *DGAP* control block <POSCNTRL> as the measured process variable.

The *DGAP* block <POSCNTRL> is used to control forward movement or reverse movement of the directional motor based on the comparison of desired position with actual position. The *DGAP* block is an on-off control block that sets two digital outputs to various states depending on where the measured position is in relationship to the deadband. Figure 7 is a diagram of these two outputs.

Fig. 7. DGAP block output.

The high gap and low gap of the DGAP block <POSCNTRL> is set to a 2-degree dead band around the desired position.

The first output of the DGAP block <POSCNTRL.DOUT> goes high when the measured position is less than the desired position minus the low-gap offset. The output goes on to a one-shot block <GOFORWRD> used to start forward movement of the pump.

The output of <GOFORWRD> will stay high for 15 seconds unless the block is reset. The reset of the block <GOFORWRD> is controlled by the inverse of the *small logic and* block <FORWARD>. When the output of <FORWARD> is low, the output of <GOFORWRD> will always be low and will not start forward movement.

The block <FORWARD> has two inputs that must go high for the output to go high to allow the pump to move forward.

- The output of <DISMOVE> must be low. This is the bit used to disable movement mentioned in the disable movement task.
- The output of <NOTRUN> must be high. This is the inverse of the feedback signal from the directional motor frequency drive that goes high when the motor is running.

When the output of <GOFORWRD> is allowed to go high it sets <DMOTOR.forwr> high, which commands the frequency drive to move the motor forward when it is running. The output of <GOFORWRD> also is passed to the block <FSTRTDEL>.

The block <FSTRTDEL> is to ensure that the forward command is sent to the frequency drive before the motor is commanded to start. The output of <FSTRTDEL> sets a *small logic or* block <START> high, which was mentioned above in the beginning of the start task of position control.

The second output of the *DGAP* block <POSCNTRL.DO2> goes high when the measured position is greater than the desired position plus the high-gap offset. The output goes on to a *one-shot* block <GOREVERS> used to start reverse movement of the pump.

The output of <GOREVERS> will stay high for 15 seconds unless the block is reset. The reset of the block <GOREVERS> is controlled by the inverse of the *small logic and* block <BACKWARD>. When the output of <BACKWARD> is low the output of <GOREVERS> will always be low and will not start reverse movement.

The block <BACKWARD> has two inputs that must go high for the output to go high and allow the pump to move backward:

- The output of <DISMOVE> must be low. This is the bit used to disable movement mentioned in the disable move task.
- The output of <NOTRUN> must be high. This is the inverse of the feedback signal from the directional motor frequency drive that goes high when the motor is running.

When the output of <GOREVERS> is allowed to go high it sets <DMOTOR.revers> high, which tells the frequency drive to move the motor in reverse when it is running. The output of <GOREVERS> also is passed to the block <RSTRTDEL>.

The block <RSTRTDEL> ensures that the reverse command is sent to the frequency drive before the motor is commanded to start. The output of <RSTRTDEL> sets a *small logic or* block <START> high, which, as noted above, starts the position motor.

An overshoot condition causes the directional motor to stop operation. This condition is recognized when <POSCNTRL.DO2> goes high and the pump is moving forward or <POSCNTRL.DOUT> goes high and the pump is moving in reverse.

The *small logic and* block <FOVER> goes high to drive the *one-shot* block <FOVRSTOP> that stops the directional motor when all three of the following conditions are true:

- <DMOTOR.inforwrd> is high, indicating the motor is moving in the forward direction.
- <POSCNTRL.DO2> is high when the actual position is beyond the desired range and the motor should be moved in reverse to achieve the desired position.
- <DMOTOR.inrun> is high, indicating the directional motor is running.

The *small logic* and <REVOVER> goes high to drive the *one-shot* block <ROVRSTOP> that stops the directional motor when all three of the following conditions are true:

- <DMOTOR.inrevers> is high, indicating the motor is moving in the reverse direction.
- <POSCNTRL.DOUT> is high when the actual position is beyond the desired range and the motor should be moved forward to achieve the desired position.
- <DMOTOR.inrun> is high, indicating the directional motor is running.

4.2.1.2 Stop. The directional motor will be stopped automatically if the position of the pump is within the desired range, the position of the pump exceeds the safe boundary, or an abort condition arises. The directional motor also can be stopped by an operator request from the STATION8 console.

The following signals are involved with the stop task in the MASFPUMP strategy.

Table VI. Position control stop variables.

BUTPULSE

DISP1

DMOTOR

FOROVER

FOVRSTOP

GOSTOP

HILIMIT

LOLIMIT

REVOVER

ROVRSTOP

STOP

STOP2

The output of the small logic or block <STOP2> controls <DMOTOR.stop>, which commands the directional motor to halt if the signal transitions from 0 to 1.

<STOP.DOUT> is also a *small logic or block* to help compile stop conditions. <STOP2.DOUT> will go high if any one of the following conditions become true.

- <STOPTEST.DOUT> which goes high when the operator requests to stop the pump, an abort condition occurs, or the pump operation time reaches the desired time.
- <GOSTOP.DOUT> goes high, which is automatically set when the pump position comes within the desired range while the directional motor is moving.
- <FOVRSTOP.DOUT> goes high, which indicates an overshoot condition while the pump is moving forward.
- <ROVRSTOP.DOUT> goes high, which indicates an overshoot condition while the pump is moving in reverse.
- <HILIMIT.DOUT> goes high, which indicates the actual pump position has exceeded the maximum boundary. This will be discussed in further detail in the position feedback task in section 4.2.1.4.
- <LOLIMIT.DOUT> goes high, which indicates the actual pump position has exceeded the minimum boundary. This will be discussed in further detail in the position feedback task in section 4.2.1.4.
- <BUTPULSE.DOUT> goes high, which indicates the operator requested the motor to stop.

Each time the position motor is stopped the movement is disabled by the output of <STOP2> setting input 1 of <DISP1> high to execute the macro DISMOV1. The macro DISMOV1 simply forces <DISMOVE> high. The disable movement task will be discussed in further detail in section 4.2.1.6.

An overshoot condition causes the directional motor to stop operation. This condition is recognized when <POSCNTRL.DO2> goes high and the pump is moving forward or <POSCNTRL.DOUT> goes high and the pump is moving in reverse.

The *small logic and* block <FOROVER> goes high to drive the *one-shot* block <FOVRSTOP> that stops the directional motor when all three of the following conditions are true.

- <DMOTOR.inforwd> is high, indicating the motor is moving in the forward direction.
- <POSCNTRL.DO2> is high when the actual position is beyond the desired range and the motor should be moved in reverse to achieve the desired position.
- <DMOTOR.inrun> is high, indicating the directional motor is running.

The *small logic and* block <REVOVER> goes high to drive the *one-shot* block <ROVRSTOP> that stops the directional motor when all three of the following conditions are true.

- <DMOTOR.inrevers> is high, indicating the motor is moving in the reverse direction.
- <POSCNTRL.DOUT> is high when the actual position is beyond the desired range and the motor should be moved in forward to achieve the desired position.
- <DMOTOR.inrun> is high, indicating the directional motor is running.

4.2.1.3 AF5000+ Communications. The AF5000 device driver is a communication task that runs in parallel with all other Genesis tasks. The device driver is responsible for sending information to and collecting information from the variable frequency drive. The device block with the tag name <DMOTOR> processes all communications for the frequency drive controlling the directional motor. The following signals are used to perform the AF5000+ communications to the position motor.

Table VII. Position control AF5000+ communication variables.

AF5COMFA
COMMOR
DACCEL
DATSPEED
DDECEL
DFAULT
DFORWARD
DLINEV
DMAXSPD
DMOTOR

DREADY
DREVENAB
DREVERSE
DRUN
DSTOP
VR232070
VR232080
VR232090
VR232100
VR232110
VR232120
GOFORWRD
GOREVERS
STARTSHT
STOP2

The following tags are used to issue commands to the frequency drive to change operating value and operating condition.

Table VIII. Position control AF5000+ communication control variables.

TAG	VARIABLE	DESCRIPTION
GOFORWRD	forwrldo0	Changes direction of motor to forward
GOREVERS	reversdo0	Changes direction of motor to reverse
STARTSHT	startdo0	Causes motor to start
STOP2	stopdo0	Causes motor to halt

The following tags are used as directional motor feedback signals from the AF5000+ device block. Some of these signals are passed to STATION5 with the PLC communication task and some are used for parameter verification.

Table IX. Position control AF5000+ communication read variables.

TAG	AF5000+ Variable	Description
COMMOR.INP1	ACCEL.fail	Indicates a failure in communications
DACCEL	ACCEL.inp	Desired acceleration rate
DDECEL	DECEL.inp	Desired deceleration rate
VR232090	FREQ.inp	Stator frequency high range
DLINEV	LINEV.hrng	Line voltage
VR232070	LOAD.inp	Motor load
DMAXSPD	MAXSPD.inp	Maximum speed
VR232100	MOTORA.inp	Motor current
VR232080	MOTORV.inp	Motor voltage
VR232120	SPDSET.inp	Desired speed of motor
VR232110	SPEED.inp	Actual speed of motor
DATSPEED	inatspd.di0	Actual speed is within $\pm 5\%$ of desired speed
DFAULT	infault.di0	Frequency drive is faulted
DFORWARD	inforward.di0	Direction of motor movement is forward
DREADY	inready.di0	Drive is ready to run
DREVERSE	inrevers.di0	Direction of motor movement is reverse
DRUN	inrun.di0	Drive is running
DSTOP	instoppd.di0	Drive is stopped
DREVENAB	reven.di0	Reverse enable

The following is a list of variables in the AF5000+ device block <DMOTOR>.

Table X. Position control AF5000+ variables.

Variable	Description
ACCEL	Desired acceleration rate
DECEL	Desired deceleration rate
FREQ	Stator frequency
LINEV	Line voltage
LOAD	Motor load
MAXSPD	Maximum speed
MOTORA	Motor current
MOTORV	Motor voltage
SPDSET	Desired speed of motor
SPEED	Actual speed of motor
forwrđ	Changes direction of motor to forward
inatspd	Actual speed is within $\pm 5\%$ of desired speed
infault	Frequency drive is faulted
inforward	Direction of motor movement is forward
inready	Drive is ready to run
inrevers	Direction of motor movement is reverse
inrun	Drive is running
instoppđ	Drive is stopped
reven	Reverse enable
revers	Changes direction of motor to reverse
start	Causes motor to start
stop	Causes motor to halt

If a failure of communications arises from the VFD the parameter <DMOTOR.ACCEL.fail> will go high which is passed on <COMMOR> which alarms <AF5COMFA>. Communications failure is an abort condition which should cause either motor drive to be automatically stopped as discussed further in the abort task section 4.2.3.

4.2.1.4 Position Feedback. There are maximum limits set on the actual position of the pump. The actual position signal comes from the block <POSITION>. The high-alarm value of <POSITION> is set to 190 degrees, and the low-alarm value is set to 15 degrees. (These limits can be changed via the manual positioning display, MASFPOSM.)

The following signals are integral to the position feedback task in the MASFPUMP strategy.

Table XI. Position control position feedback variables.

ANTON
HILIMAND
HILIMIT
INBAND
LOLIMAND
LOLIMIT
POSITION

The high-alarm bit from <POSITION> will go high when the actual position exceeds the high alarm value. This high-alarm bit is passed on to a *small logic and* block <HILIMAND>, which is used to disable the start of the directional motor to start.

The output of <HILIMAND> must be low for the directional motor to be enabled to start.

- <POSITION.HALM> is high indicating the pump has exceeded the maximum boundary.
- <DMOTOR.inforwrd> is high indicating the frequency drive is enabled to move the directional motor forward.

The high-alarm bit from <POSITION> is currently passed to a *small logic and* block <HILIMIT>, which is used to stop the directional motor and disable movement of the pump if it is running and the actual position exceeds the high limit. The output of <HILIMIT> is passed to the block <STOP>, which will cause the directional motor to stop. The output of <HILIMIT> will go high when the following three conditions are true.

- <POSITION.HALM> is high, indicating the pump has exceeded the maximum boundary.
- <DMOTOR.inrun> is high, indicating the directional motor is running.
- <DMOTOR.inforwrd> is high, indicating the directional motor will move forward when it is started.

The low-alarm bit from <POSITION> will go high when the actual position is less than the low-alarm value. This low-alarm bit is passed on to a *small logic and* block <LOLIMAND>, the output of which must be low for the directional motor to be enabled to start. The output of <LOLIMAND> will go high when both of the following conditions are true.

- <POSITION.LALM> is high, indicating the pump has exceeded the minimum boundary.
- <DMOTOR.inrevers> is high, indicating the frequency drive is enabled to move the directional motor in reverse.

The low-alarm bit from <POSITION> is also passed to a *small logic and* block <LOLIMIT>, which is used to stop the directional motor and disable movement of the pump, if it is running and the actual position falls below the low limit. The output of <LOLIMIT> is passed to the block <STOP>, which will cause the directional motor to stop. The output of <LOLIMIT> will go high when the following three conditions are true.

- <POSITION.LALM> is high, indicating the pump has fallen below the minimum boundary.
- <DMOTOR.inrun> is high, indicating the directional motor is running.
- <DMOTOR.inrevers> is high, indicating the directional motor will move in reverse when it is started.

The position feedback alarming is disabled on startup of Runtime by controlling the inhibit alarm bit of <POSITION> by <ANTON.QNOT> which will go low 10 seconds after the strategy is started. When the feedback position is within the deadband of the desired position <INBAND> is set high.

4.2.1.5 Disable Movement. The pump is disabled from moving unless the operator enables movement from the console. Each time the pump stops or goes beyond the desired range the pump is disabled from moving automatically.

The following tags in the MASFPUMP strategy are used to execute the disable movement task.

Table XII. Position control disable movement variables.

DISMOV
DISMOV1
DISMOVE
DISP1
INBAND
ON
PBPOSAN2
STOP2

The *DIN* block <DISMOVE> must have a 0 value in order to start the directional motor; This is the value set when the operator enables pump movement from the STATION8 console. The value of <DISMOVE> is set to 1 any time the directional motor is stopped or when the MOTOR strategy is first started. This is accomplished with two custom macros in EXTRA.KMS. The macro DISMOV0 is used to set <DISMOVE.DOUT> low and the macro DISMOV1 is used to set <DISMOVE.DOUT> high which will disable movement of the pump.

The following signal will execute the macro DISMOV0.

- <PBPOSAN2.DOUT> which goes high if the operator selects to position the pump during a full integrated test.

The movement of the pump is also enabled manually by the operator from the MASFOSM display.

The following signals will execute the macro DISMOV1.

- <STOP2.DOUT> will go high any time the directional motor is stopped.
- <ON.DOUT> when the MASFPUMP strategy is first started.
- <DISMOV1.DOUT> which goes high any time there is a problem with starting the position motor, the position motor is not running, and the position of the pump is not within the desired deadband.

The *function* block <DISMOV> is used to stop the directional motor and disable movement when the position of the pump is within the desired range. This block also checks the disable movement bit from <DISMOVE.DOUT>, the forward movement bit from <POSCTRL.DOUT>, and the reverse movement bit from <POSCNTRL.D02>. When all three conditions are not true an internal control bit <DRI> starts an internal counter <AR1>. This counter is used to delay the stop of the pump by 2 seconds after the position is within the dead band. This allows the pump to move closer to the desired position before shutting down movement. When the internal counter reaches 2 seconds the directional motor is commanded to stop and movement is disabled by control bit <DISMOV.DOUT>.

The *function* block <DISMOV> also has a logic equation to determine if the pump is within the desired range. <DISMOV.D02> is passed to <INBAND>, which is used to indicate the pump is within the dead band range of 2 degrees.

4.2.2 Pump Control. The following are the details related to controlling the operation of the mixing pump to actually mix the contents of the tank.

4.2.2.1 Start. The AF5000+ device block variable <PMOTOR.start> requires a transition from 0 to 1 to start operation of the pump motor. The <PMOTOR.start> variable is driven by the output of the block with the tag name <PBSTRTDN>. <PBSTRTDN> will go high when the operator successfully starts a fully integrated test for pump operation. Test operation will be explained in detailed sections to follow.

The following blocks are involved with the start pump control start task.

Table XIII. Pump control start variables.

PBSTRTDN

PMOTOR

4.2.2.2 Stop. The AF5000+ device block variable <PMOTOR.stop> requires a transition from 0 to 1 to stop operation of the pump motor. The <PMOTOR.stop> variable is driven by the output of a *small logic or* block with the tag name <STOPTEST>.

The <STOPTEST> block will go high when the pump operation is stopped automatically from an abort condition, from the elapsed time exceeding the desired times, the operator manually stopping pump operation, or failure in communications to either VFD.

The following blocks are involved with the stop pump control task.

Table XIV. Pump control stop variables.

PMOTOR

STOPTEST

4.2.2.3 AF5000+ Communications. The AF5000+ device driver is a communication task that runs in parallel with all other Genesis tasks. The device driver is responsible for sending information to and collecting information from the variable frequency drive. The device block with the tag name <PMOTOR> processes all communications for the frequency drive controlling the pump motor.

The following signals are used to perform the communications task for the pump control.

Table XV. Pump control AF5000+ communication variables.

AF5COMFA

COMMOR
EQUSPD
PACCEL
PATSPED
PDECEL
PFAULT
PFORWARD
PLINEV
PMAKSPD
PMOTOR
PREADY
PREVENAB
PREVERSE
PRUN
PSTOP
VR232020
VR232030
VR232040
VR232050
VR232060
VSDRS232

The following tags are used to issue commands to the frequency drive to change operating values and operating conditions.

Table XVI. Pump control AF5000+ communication control variables.

TAG	AF5000+ Variable	Description
COMMOR.QNOT	forwrd.do0	Changes direction of motor to forward
PBSTRTDN	start.do0	Causes motor to start
STOPTEST	stop.do0	Causes motor to halt

The following tags are used as pump feedback signals from the AF5000+ device block. Some of these signals are passed to STATION5 with the PLC communication task, and some are used for parameter verification.

Table XVII. Pump control AF5000+ communications read variables.

TAG	AF5000+ Variable	Description
COMMOR.INP2	ACCEL.fail	Indicates a failure in communications
PACCEL	ACCEL.inp	Desired acceleration rate
PDECEL	DECEL.inp	Desired deceleration rate
VR232030	FREQ.hrng	Stator frequency high range
PLINEV	LINEV.inp	Line voltage
VSDRS232	LOAD.inp	Motor load
PMAXSPD	MAXSPD.inp	Maximum speed
VR232040	MOTORA.inp	Motor current
VR232020	MOTORV.inp	Motor voltage
VR232060	SPDSET.inp	Desired speed of motor
VR232050	SPEED.inp	Actual speed of motor
VSDRS232	LOAD.inp	VSD% load
PATSPEED	inatspd.di0	Actual speed is within $\pm 5\%$ of desired speed
PFAULT	infault.di0	Frequency drive is faulted
PFORWARD	inforward.di0	Direction of motor movement is forward
PREADY	inready.di0	Drive is ready to run
PREVERSE	inrevers.di0	Direction of motor movement is reverse
PRUN	inrun.di0	Drive is running

PSTOP	instoppd.di0	Drive is stopped
PREVENAB	reven.di0	Reverse enable

The following is a list of variables in the AF5000+ device block <PMOTOR>.

Table XVIII. Pump control AF5000+ communication variables.

Variable	Description
ACCEL	Desired acceleration rate
DECEL	Desired deceleration rate
FREQ	Stator frequency
LINEV	Line voltage
LOAD	Motor load
MAXSPD	Maximum speed
MOTORA	Motor current
MOTORV	Motor voltage
SPDSET	Desired speed of motor
SPEED	Actual speed of motor
forwrđ	Changes direction of motor to forward
inatspd	Actual speed is within $\pm 5\%$ of desired speed
infault	Frequency drive is faulted
inforward	Direction of motor movement is forward
inready	Drive is ready to run
inrevers	Direction of motor movement is reverse
inrun	Drive is running
instoppd	Drive is stopped
reven	Reverse enable

revers	Changes direction of motor to reverse
start	Causes motor to start
stop	Causes motor to halt

If a failure of communications arises from the VFD the parameter <PMOTOR.ACCEL.fail> will go high which is passed on <COMMOR> which alarms <AF5COMFA>. Communications failure is an abort condition which should cause either motor drive to be automatically stopped as discussed further in the abort task section 4.2.3.

4.2.2.4 Parameter Verification. The following blocks are used for parameter verification in the MASFPUMP strategy.

Table XIX. Pump control parameter verification variables.

CALCURR
CALDISPR
CURABRT
CURALRM
CURPRED
DISPRABT
DISPRALM
DISPRPRE
EQUSPD
VR232050
VR232060

The *function* block <EQUSPD> contains an equation to compare the desired speed set in the frequency drive <VR232060> with the actual speed <VR232050>. The variable <EQUSPD.DRI> will be high if the actual speed is within 5% of the desired speed. This will be displayed to the operator as a light green indication on the pump speed bar graphs.

The desired speed value is passed to the function block <CALCURR> uses <CURPRSPD> as the desired speed and automatically calculates the predicted motor current, which is passed to <CURPRED>.

The predicted motor current plus 20% is passed to <CURALRM> as the alarm limit. The output of <CURALRM> sets the high alarm value of <VR232040> and is passed to the PLC for the high motor alarm.

The predicted motor current plus 40% is passed to <CURABRT> as the abort limit. The output of <CURABRT> is passed to the PLC as the abort limit for motor current.

The desired pump speed is also passed to the *function* block <CALDISPR> which automatically calculates the predicted discharge pressure, which is passed to <DISPRPRE> for operator display.

The predicted discharge pressure plus 20% is passed to <DISPRALM> as the alarm limit, and the output of <DISPRALM> is passed to the PLC to set the high alarm value of the discharge pressure signal.

The predicted discharge pressure plus 40% is passed to <DISPRABT> as the abort limit, and the output of <DISPRABT> is passed to the PLC as the abort limit for the discharge pressure.

4.2.3 Abort. Certain conditions are monitored continuously in the MASFPUMP strategy as abort criteria to stop both motors automatically. Also abort conditions will prevent the start of either motor.

The following blocks are involved with the abort task.

Table XX. Abort variables.

A5ABRT
ABORT
ABORTOR
ABORTPUL
COMMOR
NODEFAIL
PLCFAIL

The current abort status is indicated by the *small logic* or block <ABORTOR> which has the following input conditions.

- <ABORT.DOUT> is high if the abort coil in the PLC is active.
- <COMMOR.DOUT> is high if either VFD has a failure in communications to the MASFPUMP strategy.
- <NODEFAIL.DOUT> is high if a failure in communications from STATION5 to the PLC is recognized.
- <PLCFAIL.DOUT> is high if a failure of communications to the PLC is recognized from the MASFPUMP strategy.

The output of <ABORTOR> is passed to a *small logic pulse* block <ABORTPUL> which is passed on to <STOPTEST> which will stop either VFD with a communication command.

<COMMOR> is a *small logic or block* with two inputs from each hardware device block. If communications to either frequency drive goes bad, indicated by a fail bit of the first parameter selected from each hardware device block, <COMMOR.DOUT> will go high. This signal is passed to the PLC with the *digital output* block <A5ABRT>.

4.2.4 Test Operation. This section provides the details of the actual test operation, including their selection, how the elapsed time is calculated, and the information provided to the operator.

4.2.4.1 Test Creation and Selection. This section is only intended for MINIDACS-1 control system to create and select predefined tests. The MiniDACS system does implement this feature and will not be discussed in detail. The following blocks are related to test creation and selection.

Table XXI. Test creation and selection variables.

ACCELCHG
ANGLECHG
CHANGED
CHGCHK1
CLRMESS
DECELCHG
DELPUL
HRSCHG
INFILE
MANUAL
MAXINDEX
MINSCHG
NEXTINDEX
NEXTPUL
OACCEL
OANGLE
ODECEL
OHR
OLDTEST
OMINS
ORESTIM

OSECS
OSPEED
PBTESTNO
PREVPUL
RESCHG
SAVEPUL
SECSCHG
SPEEDCHG
TESTCHG
TESTSET
TESTSET2
UACCEL
UANGLE
UDECEL
UHRS
UMINS
UMSG1
URESTIM
USECS
USPEED
UTESTNO

4.2.4.2 Elapsed Time Calculation. There are two elapsed timers that are used during test operation. The overall timer for test operation keeps track of the total test time. The is a second timer to time pump operation time.

The following blocks are integral is performing the elapsed time calculation task.

Table XXII. Test operation elapsed time calculation variables.

DF65535
DFLT0
DISP4
PB30SEC
PBCALSEC
PBDNTM
PBHR

PBMIN
PBRAMP
PBRAMPHL
PBSEC
PBSPLIT
RESETPB
RSECPB
SPLITPB
TSTRUNNG

The *RAMP* block <RSECPB> totals the test time while a test is in operation. When ramp rate 1 becomes active the output of <RSECPB> increments by one every second.

A test is in operation when the *rs flip-flop* block <TSTRUNNG> is high. This signal controls <RSECPB.RPIO>, which activates ramp rate 1. The elapsed timer <RSECPB> is reset at the beginning of test operation by <RESTPB> which is set high with the RR code PBSETVAL.RPS when a new test is selected. The elapsed test time is broken down from seconds into hours, minutes, and seconds by the *function* block <SPLITPB>.

There is a second elapsed timer used to keep track of the pump operation time at each position. The *RAMP* block <PBRAMP> totals the time the pump is in operation. When ramp rate 1 becomes active, the output of <PBRAMP> increments by one every second.

The pump is in operation when the *rs flip-flop* block <TSTRUNNG> is high. This signal controls <RSECPB.RPIO>, which activates ramp rate 1.

The elapsed timer <PBRAMP> is reset at the beginning of pump operation by <SETVALDN> which goes high when the test values have been successfully set. The high limit of <PBRAMP> is controlled by <PBRAMPHL> which will pass either the value 0 from <DFLT0> or the maximum pump operation time from <DF65535>. <PBRAMPHL> will pass the value of <DF65535> when <SETVALDN> is high when the test values are successfully loaded.

The desired pump operation time is set during test selection by setting the test values. The *A/I/V* blocks <PBHR>, <PBMIN>, and <PBSEC> contain the desired minutes and seconds for pump operation. The outputs of these blocks are passed to a *function* block <PBCALSEC>, which merges the values into one desired pump operation time value in seconds. This value is passed to the *function* block <PBSPLIT>, which is used to stop pump operation when the elapsed time from <PBRAMP> exceeds the desired time from <PBCALSEC>.

The control bit <PBSPLIT.DOUT> will go high when the elapsed time exceeds the desired time and is passed to the *DIN* <PBDNTM>. The output of this block resets the *rs flip-flop* block <PBRSEFF> mentioned above. The output of <PBDNTM> is passed to logic which stops pump operation by setting <STOPTEST> high. <PBSPLIT> also breaks seconds of pump operation into hours, minutes, and seconds for operator display.

The desired pump operation times are reset by the output of <STOPTEST> executing the macro RESPTIM which is referenced in <DISP4>.

The *alarm* block <PB30SEC> is used to warn the operator 30 seconds before the end of pump operation. The high alarm value of <PB30SEC> is set by the second analog output of <PBCALSEC> which is set to 30 less than the desired pump operation time during test operation and to a very large number when a test is not in operation.

4.2.4.3 Operator Test Information. There is logic within the MASFPUMP strategy for indication of test operation status. There is status bits for test values set correctly, pump at desired position, test enabled to start, and test running. If a function is selected by an operator and the task was not successfully executed there is logic to indicate what the problem is. The following sections describe each main task execution and status feedback for indication of success of operation.

4.2.4.3.1 Set Test Values. The desired test values selected by the operator must be downloaded to the control parameters in the MASFPUMP strategy. This is done by the operator with the set values button. The following blocks are related to the set test values task.

Table XXIII. Set test values variables.

NORUN
PBENABLE
PBREPORT
PBSETAND
SETTEST
SETVALDN
STOPTEST
TSTRUNNG
VALSET

The *small logic pulse* block <SETTEST> starts the execution of the set values task. Its output is passed to the *small logic and* block <PBSETAND> which has the following input conditions to be true before executing the RR code PBSETVAL.RPS by setting input 1 of <PBREPORT> high.

- <SETTEST.DOUT> is set high by the operator to set the test values.
- <PBENABLE.QNOT> is high if a test is not already enabled.
- <TSTRUNNG.QNOT> is high if a test is not in progress.
- <NORUN.DOUT> is high if both the pump motor and position motor are stopped.
- <VALSET.QNOT> is high if the test values are not already set.

At the end of the RR code PBSETVAL.RPS <SETVALDN> is set high to indicate the test values are successfully set. <SETVALDN> has a pulsed output and sets the *rs flip-flop* block <VALSET> high. <VALSET.DOUT> is the status bit used to indicate that the test values have been successfully set. <VALSET> is reset when <STOPTEST> goes high when a test is stopped.

4.2.4.3.2 Problem with Setting Test Values. If the test values are requested to be set and the task is not successfully completed the following blocks are used to indicate what the problem is.

Table XXIV. Problem with setting test values variables.

DISP3
NORUN
NOSEPROB
PBBUTSTP
PBPROB
PDISP
RSETPROB
SEDISP
SETPROB
SETPROBA
SETPROBR

The *rs flip-flop* block <SETPROB> is used to indicate a problem with setting the test values. <SETPROB> is set high if the output of <SETPROBA> is high and the reset input <SETPROBR> is low.

<SETPROBA> is a *small logic and* block with the following inputs.

- <SETTEST.DOUT> is high if the test values are requested to be set.
- <NORUN.DOUT> is high if both motors are stopped.

- <VALSET.QNOT> is high if the test values are not set.
- <SETPROBR> will reset <SETPROB> if any of the following conditions are true.
 - <RSETPROB.DOUT> which is set high by the operator to reset the problem indication.
 - <PBBUTSTP.DOUT> which goes high when the operator manually stops a test.
 - <NOSEPROB.DOUT> which is a *small logic and* block with the following input conditions.
 - <PBENABLE.QNOT> is high when a test is not enabled.
 - <TSTRUNNG.QNOT> is high when a test is not running.
 - <NORUN.DOUT> is high when both motors are stopped.

When <SETPROB> goes high <PBPROB> is set high which indicates a test operation problem. The *small logic and* block <SEDISP> is used to bring up the problem indication display for setting test values. When <SETPROB> is high and the operator sets <PDISP> high to view the problem the display SETPROB is brought up via the *display* block <DISP3>.

4.2.4.3.3 Position Pump Selection. When the test values are set the desired pump position is compared with the actual position. If the pump is not at the desired position the pump will need to be positioned before a test can be enabled, except for a pump bump which does not need to check pump position. The following blocks are key in the pump position selection.

Table XXV. Pump position selection variables.

ABORTOR
INPOSI
NORUN
PBENABLE
PBPOSAN2
PBPOSAND
PBPOSPMP
POSSET
TSTRUNNG
VALSET

<PBPOSPMP> starts the execution of the pump position selection. Its output is passed to the *small logic and* block <PBPOSAND> which together with <PBPOSAN2> has the following input conditions before <PBPOSAN2> will start the

pump position control by executing the macro DISMOV0 as discussed earlier in the disable movement task section.

- <TSTRUNNG.QNOT> which is high if a test is not running.
- <ABORTOR.QNOT> which is high if an abort conditions is not active.
- <PBENABLE.QNOT> is high if a test is not enabled.
- <VALSET.DOUT> is high if the test values are set.
- <NORUN.DOUT> is high if both motors are stopped.
- <PBPOSPMP.DOUT> goes high when the operator selects to position the pump.
- <POSSET.QNOT> which is an *AND* block with the following input conditions.
 - <VALSET.DOUT> is high when the test values are set.
 - <INPOSI.DOUT> which is high when the pump is at the desired position.

4.2.4.3.4 Problem with Position Pump Selection. If the pump position selection does not successfully execute the following blocks are used to indicate what the problem is.

Table XXVI. Problem with position pump selection variables.

ABORTOR
DISP3
NOPOPJOB
NORUN
PBBUTSTP
PBENABLE
PBPOSPMP
PBPROB
POSDISP
POSPROB
POSPROBA
POSPROBR
POSSET
RPOSPROB
TSTRUNNG
VALSET

The *rs flip-flop* block <POSPROB> is used to indicate a problem with selecting to position the pump. <POSPROB> is set high if the output of <POSPROBA> is high and the reset input <POSPROBR> is low. <POSPROBA> is a *small logic and* block with the following inputs.

- <PBPOSPMP.DOUT> is set high by the operator to position the pump.
- <POSSET.QNOT> which is high when the pump is not in position or the test values are not set.
- <NORUN.DOUT> is high when both motors are stopped.
- <VALSET.DOUT> is high if the test values have been set.

<POSPROBR> will reset <POSPROB> if any of the following conditions are true.

- <RPOSPROB.DOUT> which is set high by the operator to reset the problem indication.
- <PBBUTSTP.DOUT> which goes high when the operator manually stops a test.
- <NOPOPROB.DOUT> which is a *small logic and* block with the following input conditions.
 - <ABORTOR.QNOT> which is high if no abort condition is active.
 - <TSTRUNNG.QNOT> is high if a test is not running.
 - <PBENABLE.QNOT> is high if a test is not enabled.
 - <VALSET.DOUT> is high if the test values are set.
 - <NORUN.DOUT> is high if both motors are stopped.

When <POSPROB> goes high <PBPROB> is set high which indicates a test operation problem. The *small logic and* block <POSDISP> is used to bring up the problem indication display for position pump selection. When <POSPROB> is high and the operator sets <PDISP> high to view the problem the display <POSPROB> is brought up via the *display* block <DISP3>.

4.2.4.3.5 Problem with Position Pump Operation. When the position motor is to be started to position the pump and a problem prevents the actual movement of the pump the following blocks are used to indicate what the problem is.

Table XXVII. Position pump operation problem variables.

ABORTOR
DDISP
DISMOV1
DISMOVE
DISP1
DISP3

DMDISP
DMPROB
DMPROBDI
DMPROBR
DRUN
DSTOP
ENMOVPUL
ENMOVTON
HILIMAND
HOLDENMO
INBAND
LOLIMAND
NODMPROB
PBDMPROB
PBPROB
PBPROB2
PDISP
POSDISP
PRUN
PSTOP
RDMPROB

The *rs flip-flop* block <DMPROB> is used to indicate a problem with positioning the pump. <DMPROB> is set high if the *small logic pulse* block <ENMOVPUL> is high and the reset input <DMPROBR> is low. <ENMOVPUL> is set high by <ENMOVTON> which delays <HOLDENMO> for 4 seconds. <HOLDENMO> stays high for 5 seconds after the pump is requested to move by <DISMOVE> going low. <DMPROBR> will reset <DMPROB> if any of the following conditions are true.

- <RDMPROB.DOUT> which is set high by the operator to reset the problem indication.
- <NODMPROB.DOUT> which is a *small logic and* block with the following input conditions.
 - <INBAND.QNOT> which indicates the pump is not within the desired position.
 - <ABORTOR.QNOT> which is high if no abort condition is active.

- <HILIMAND.QNOT> is high if the pump position is not beyond the high range.
- <LOLIMAND.QNOT> is high if the pump position is not beyond the low range.
- <PSTOP.DOUT> is high if the pump motor is stopped.
- <PRUN.QNOT> is high if pump motor is not running.

If there is a problem indicated by <DMPROB> and the test values are set and the pump is not in position <PBDMPROB> goes high which is then passed to <PBPROB> through <PBPROB2>. The *small logic and* block <DMPROBDI> is used to bring up the problem indication display for positioning the pump. When <PBDMPROB> is high and the operator set <PDISP> high to view the problem and there is no problem with the position selection from <POSDISP.QNOT> the display DMPROB will be brought up via the *display* block <DISP3>.

The *small logic and* block <DISMOV1> will execute the macro DISMOV1 to disable movement of the pump. <DISMOV1> has the following input conditions.

- <DISMOVE.QNOT> is high if movement is enabled.
- <DRUN.QNOT> is high if the position motor is not running.
- <DSTOP.DOUT> is high if the position motor is stopped.

The *small logic and* block <DMDISP> is used to bring up the problem indication display for positioning the pump. When <DMPROB> is high and the operator sets <DDISP> high to view the problem from the MASFPUMP display the display DMPROB is brought up via the *display* block <DISP1>.

4.2.4.3.6 Test Enable. Before test operation can be started a test must be enabled. The enable task is used to check the values set for a test to ensure proper test operation. The following blocks are involved with the test enable function. Table XXVIII. Test enable variables.

BPOSGATE
CHKCOLOR
DO1-6DEV
DO1-7DEV
DO1DEV
DO2DEV
DO3DEV
DO4DEV
DO5DEV
DO6DEV
DO7DEV

ENCHECK
NORUN
PBCHK1
PBCHKCLR
PBENABLE
PBENAND
PBENOR
PBENREST
PBENRSRS
PBENTIMO
PBENTON
POSORBUM
RSCHECK
RSCHECKR
STOPTEST
TSTRUNNG

The *small logic pulse* block <CHKCOLOR> starts the execution of the test enable task. Its output is passed to the *small logic and* block <PBCHKCLR> which works with <PBENAND> to require the following input conditions before a test can be enabled by setting <PBENABLE> high.

- <CHKCOLOR.DOUT> which is set high by the operator to enable a test.
- <NORUN.DOUT> is high if both motors are stopped.
- <TSTRUNNG.QNOT> is high if a test is not running.
- <PBENABLE.QNOT> is high if a test is not enabled.
- <POSORBUM.DOUT> is high if the pump is in position or a pump bump is to be executed.
- <DO1-7DEV.QNOT> is high when all of the following conditions are not active. <DO1-6DEV> is also used to compile the conditions.
 - <PBCHK1.DALM> is high when the PLC test time does not match the desired test time.
 - <BPOSGATE.DOUT> is high if the pump is not position, <DO1DEV.DALM>, and the test is not a pump bump.
 - <DO2DEV.DALM> is high if the desired pump speed does not match the pump speed in the VFD.

- <DO3DEV.DALM> is high if the desired pump acceleration does not match the acceleration set in the VFD.
- <DO4DEV.DALM> is high if the desired pump deceleration does not match the deceleration set in the VFD.
- <DO5DEV.DALM> is high if the desired pump maximum speed does not match the VFD feedback.
- <DO6DEV.DALM> is high if the set speed alarm does not match the PLC feedback.
- <DO7DEV.DALM> is high if the pump speed abort limit does not match the PLC feedback.

The test enable bit <PBENABLE> is reset when <PBENOR> has one of the following input conditions are true.

- <STOPTEST.DOUT> goes high when a test is stopped.
- <PBENREST.DOUT> is a 4 second time delay of the *small logic and* block <PBENTIMO>. <PBENTIMO> has the following input conditions.
 - <PBENTON.DOUT> will go high if a test is enabled and a test is not started within 60 seconds.
 - <TSTRUNNG.QNOT> is high if a test is not running.

<ENCHECK> is a status bit used to enable color control on the test operation displays for critical parameters. This bit comes from the *rs flip-flop* block <RSCHECK> which is set high by <PBCHKCLR> and reset by <RSCHECKR> which will go high when any of the following conditions go high.

- <SETVALDN.DOUT> goes high when the test values are set.
- <STOPTEST.DOUT> goes high when a test is stopped.

4.2.4.3.7 Problem with Test Enable. If the test enable function was desired but not successfully completed the following blocks are used to indicate what the problem is.

Table XXIX. Problem with test enable variables.

CHKCLRRTN
DISP3
DO1-7DEV
NOPENAB
NORUN
PBBUTSTP
PBENABLE
PBENADIS

PBENRSRS
PBPROB
PDISP
PENAB
PENABA
PENABR
POSORBUM
RPENAB
TSTRUNNG

The *rs flip-flop* block <PENAB> is used to indicate a problem with enabling a test. <PENAB> is set high if the output of <PENABA> is high and the reset input <PENABR> is low. <PENABA> is a *small logic and* block with the following inputs.

- <PBENABLE.QNOT> is high if a test is not enabled.
- <NORUN.DOUT> is high if both motors are stopped.
- <CHKCLRTN.DOUT> will go high 1 second after the operator tries to enable a test.
- <POSORBUM.DOUT> is high if the pump is in position or a pump bump is to be executed.

<PENABR> will reset <PENAB> if any of the following conditions are true.

- <RPENAB.DOUT> which is set high by the operator to reset the problem indication.
- <PBBUTSTP.DOUT> which goes high when the operator manually stops a test.
- <NOPENAB.DOUT> which is a *small logic and* block with the following input conditions.
 - <DO1-7DEV.QNOT> is high if no problem exists with the feedback parameters.
 - <NORUN.DOUT> is high if both motors are stopped.
 - <TSTRUNNG.QNOT> is high if a test is not running.
 - <POSORBUM.DOUT> is high if the pump is at the desired position of a pump bump is to be executed.
 - <PBENRSRS.DOUT> is high if the test enable has timed out.

When <PENAB> goes high <PBPROB> is set high which indicates a test operation problem. The *small logic and* block <PBENADIS> is used to bring up the problem indication display for enabling a test. When <PENAB> is high and the operator sets <PDISP> high to view the problem the display PBENPROB is brought up via the *display* block <DISP3>.

4.2.4.3.8 Test Start. After test parameters are downloaded and a test is enabled the operator can start a test which will operate the pump for a desired period of time. The following blocks are related to the test start task.

Table XXX. Test start variables.

ABORTOR
NORUN
PBENABLE
PBENTON
PBSPLIT
PBSTRAN2
PBSTRAND
PBSTRTDN
PBSTTEST
PLCPBENA
STOPTEST
TSTRUNNG
VALSET

The *small logic pulse* block <PBSTTEST> starts the execution of the test start task. Its output is passed to the *small logic and* blocks <PBSTRAND> and <PBSTRAN2> which have the following input conditions to be true before starting a test.

- <PLCPBENA.DOUT> which is high if the test enable status bit is high in the PLC.
- <PBSTTEST.DOUT> is set high by the operator to start a test.
- <PBENABLE.DOUT> is high if a test is enabled.
- <TSTRUNNG.QNOT> is high if a test is not running.
- <VALSET.DOUT> is high if the test values are set.
- <NORUN.DOUT> is high if both motors are stopped.
- <ABORTOR.QNOT> is high if no abort condition is active.
- <PBENTON.DO2> is high when the test enable has not timed out.
- <PBSPLIT.DO3> is high if the elapsed test time is not greater than or equal to the desired time.

The output of <PBSTRAN2> is passed onto <PBSTRTDN> which starts the pump motor and sets the *rs flip-flop* block <TSTRUNNG> high. <TSTRUNNG> is reset from <STOPTEST> when a test is stopped.

4.2.4.3.9 Problem with Starting a Test. If the start of a test is not permitted the following blocks were used to indicate what the problem is.

Table XXXI. Problem with start a test variables.

ABORTOR
DISP3
NOPSPRO2
NOPSPROB
NORUN
PBBUTSTP
PBENABLE
PBENTON
PBPROB
PBSPLIT
PBSTTEST
PLCPBENA
PSDISP
PSPROB
PSPROBA
PSPROBR
RPSPROB
TSTRUNNG
VALSET

The *rs flip-flop* block <PSPROB> is used to indicate a problem with starting a test. <PSPROB> is set high if the output of <PSPROBA> is high and the reset input <PSPROBR> is low. <PSPROBA> is a *small logic and* block with the following inputs.

- <PBSTTEST.DOUT> is set high by the operator to start a test.
- <TSTRUNNG.QNOT> is high if a test is not running.
- <PBENABLE.DOUT> is high if a test is enabled.

<PSPROBR> will reset <PSPROB> if any of the following conditions are true.

- <RPSPROB.DOUT> which is set high by the operator to reset the problem indication.
- <PBBUTSTP.DOUT> which goes high when the operator manually stops a test.
- <NOPRPRO2.DOUT> which is a *small logic and* block that works with <NOPSPROB> to compile the following input conditions.

- <PBENABLE.DOUT> is high if a test is enabled.
- <PLCPBENA.DOUT> is high if the test enable bit in the PLC is high.
- <ABORTOR.QNOT> is high if no abort condition is active.
- <VALSET.DOUT> is high if the test values are set.
- <NORUN.DOUT> is high if both motors are stopped.
- <PBENTON.DO2> is high if the test enable did not time out.
- <PBSPLIT.DO3> is high if the elapsed test time is less than the desired time.

When <PSPROB> goes high <PBPROB> is set high which indicates a test operation problem. The *small logic and* block <PSDISP> is used to bring up the problem indication display for starting a test. When <PSPROB> is high and the operator sets <PDISP> high to view the problem the display PSPROB is brought up via the *display* block <DISP3>.

4.2.5 Pump Bump Operation. The following sections give the details of the "pump bump" operation, which consists of running the pump for short time periods so as not to allow waste to harden inside the pump or to test operation of the pump.

4.2.5.1 Pump Bump Enable. The pump operation can be started with operator adjustable speed, maximum speed, acceleration, deceleration, and desired runtime. This is done from the MASFPUMP display and this test operation is considered to be a pump bump. Test operation is handled slightly differently for a pump bump. The position of the pump does not have to be at the desired position for a test to be enabled. Also the test values for critical parameters do not come from predefined tests. The following blocks are used to make the existing test operation work for a pump bump.

Table XXXII. Pump bump enable variables.

BENAB
BPOSGATE
BUMPENAB
CHKANDPO
CHKCLR1
DISP2
ENABBUMP
ENABDLY
NORUN
PBENABLE

POSORBUM
RESETBEN
SETPROB

The *small logic pulse* block <ENABBUMP> starts the execution of the pump bump task. Its output sets <BENAB> high if the reset input <RESETBEN> is low. <RESETBEN> is high when one or more of the following are true.

- <CHKANDPO> is set high when the test enable is requested and the pump is in position or a pump bump is requested.
- <SETPROB.DOUT> goes high when a problem occurs with setting the test values.
- <PBENABLE.DOUT> goes high when a test is enabled.
- <NORUN.QNOT> is high when a motor is running.

The output of <BENAB> is passed to <POSORBUM> so the pump position is ignored for a pump bump. <BENAB.QNOT> is passed to <BPOSGATE> so the pump position is checked for a test enable if a regular test is used. The output of <BENAB> is passed to <BUMPENAB> which executes the macro SETTES1 to set the test values. If the output of <BUMPENAB> is high and the test values are set the *small logic and* block <CHKCLR1> goes high. The output of <CHKCLR1> is delayed by 1 second by <ENABDLY> before executing the macro in <DISP2> CHKCLR1 to enable a test.

4.2.6 PLC Communications. The MASFPUMP strategy has communications directly to the PLC for update and control of registers and bits in the PLC. The following table is a list of tags that are used for communications to the PLC.

Table XXXIII. PLC communication variables.

<u>PLC REGISTER</u>	<u>TAGNAME</u>	<u>DESC</u>	<u>BLOCK_TYPE</u>
	242 ST8WDRES	WATCHDOG BIT	DIGITAL OUTPUT
	249 PBENAB	PHASE B TEST ENABLE TO PLC	DIGITAL OUTPUT
	251 A5ABRT	AF5000 COMM ABORT	DIGITAL OUTPUT
2001-2016	J2C0		PAK DIGITAL INPUT
	2015 ZIMPE144	CCW POSITION LIMIT	DIGITAL INPUT
	2016 ZIMPE143	CW POSITION LIMIT	DIGITAL INPUT
2017-2032	J2C1		PAK DIGITAL INPUT
	2017 MIP00001	MOISTURE IN PUMP MOTOR OIL	DIGITAL INPUT

2033-2048	J2C2		PAK DIGITAL INPUT
	2042 ABORT	PLC ABORT COIL SET	DIGITAL INPUT
	2043 PLCPBENA	TEST ENABLE FROM PLC	DIGITAL INPUT
	2044 PLCWD	WATCH DOG FROM PLC	NOT
	2048 NODEFAIL	STATION5 COMM FAIL	DIGITAL INPUT
40208-40215	I2C1		PAK ANALOG OUTPUT
	40208 SWCABRT	PUMP CURRENT ABORT	SWCH
	40209 DISPRABT	DISCH PRESSURE ABORT	ANALOG INPUT
	40210 PBCALSEC	DESIRED HOURS FROM FX GENESIS	
	40211 SWCALRM	PUMP CURRENT ALARM	SWCH
	40212 PBCALSEC	DESIRED SECONDS FROM FX GENESIS	
	40213 SWCSPDAB	PUMP SPEED ABORT SET	SWCH
	40214 SWCSPDAL	PUMP SPEED ALARM SET	SWCH
	40215 VR232020	PUMP MOTOR VOLTAGE	ANALOG INPUT
40216-40223	I2C2		PAK ANALOG OUTPUT
	40216 VR232080	ROTATION MOTOR VOLTAGE	ANALOG INPUT
	40217 VR232100	ROTATION MOTOR CURRENT	ANALOG INPUT
	40218 VR232110	ROTATION MOTOR SPEED	ANALOG INPUT
	40219 VR232040	PUMP MOTOR CURRENT	ANALOG INPUT
	40220 VR232050	PUMP MOTOR SPEED	ANALOG INPUT
	40223 DISPRALM	DISCH PRESSURE ALARM	ANALOG INPUT
42001-42008	J1C0		PAK ANALOG INPUT
	42003 TIR12A02	MIX PUMP MOTOR OIL TEMP 2	ANALOG INPUT
	42004 TIR12A01	MIX PUMP MOTOR OIL TEMP 1	ANALOG INPUT
42129-42136	I1C0		PAK ANALOG INPUT
	42131 POSITION	POSITION FROM PLC	ANALOG INPUT
42217-42224	I1C11		PAK ANALOG INPUT
	42217 PLCAMPAL	FROM PLC, AMPS ALARM LIMIT	ANALOG INPUT
	42218 PLCAMPAB	FROM PLC, AMPS ABORT LIMIT	ANALOG INPUT
	42219 PLCDPRAL	FROM PLC, DISCH PRESS ALARM	ANALOG INPUT
	42220 PLCDPRAB	FROM PLC, DISCH PRESS ABORT	ANALOG INPUT

42221 HPSPDLIM	HIGH SPEED ABORT LIMIT	ANALOG INPUT
42222 VR050HAV	HIGH SPEED ALARM LIMIT	ANALOG INPUT
42223 PLCTIADD	PLC DESIRED HOURS	ANALOG INPUT
42224 PLCTIADD	PLC DESIRED SECONDS	ANALOG INPUT
42225-42232 I1C12		PAK ANALOG INPUT
42231 PLCCURAB	FROM PLC, PUMP CURRENT ABORT	ANALOG INPUT
42232 PLCCURAL	FROM PLC, PUMP CURRENT ALARM	ANALOG INPUT

To report a failure in PLC the *DIN* block <PLCFAIL> will alarm in the MASFPUMP strategy. <PLCFAIL> receives the signal from <PLCFAIL2> which is a *small logic* or block that has three input conditions.

- <PLCWDON.DOUT> goes high if the PLC toggle bit <PLCWD> stays high for more than 2 seconds.
- <PLCWDOFF.DOUT> goes high if the PLC toggle bit <PLCWD> stays low for more than 2 seconds.
- <I1C0.FAIL> which will go high if there is a failure in communications in the ModPlus Genesis driver.

4.2.7 Alarming. All algorithm blocks with an alarm priority greater than 0 are enabled as alarming signals. If an alarm level is exceeded the tag and description will show up in the alarm summary to tell the operator which signal is in alarm. Refer to the data dictionary of the MASFPUMP strategy for all alarm signals with alarm priorities greater than 0.

4.2.8 System Parameters. There are several Report blocks used to execute R&R code. Following is a list of Report blocks in the strategy with the R&R code that each block serves. Refer to Appendix D for a description of each R&R code.

Table XXXIV. Report blocks with Report and Recipe code allocation.

TAG	SOURCE1	SOURCE2	SOURCE3	SOURCE4
TESTSET2	ULOAD	NEXT	PREV	ILOAD
PBREPORT	PBSETVAL			
TESTSET	SAVE	DELETE	CLRMESS	

The *d flip-flop* block in the center of the database contains the version of the strategy as its tag name. <V3.00> would be the tag name for version 3.00 of the strategy. The block <VERSION> contains the version number in the descriptive field.

4.2.9 Stop Test. The stop test task will stop operation of either motor and reset operator status feedback. The following blocks are used in the stop task. Table XXXV. Stop test variables.

ABORTPUL
DISP4
PBBUTSTP
PBDNTM
STOPTEST

The operator can manually stop a test by setting <PBBUTSTP> high. The output of <PBBUTSTP> is passed to <STOPTEST> which stops the motors and resets the desired pump operation time with the macro RESPTIM in the *display* block <DISP4>. <STOPTEST> also resets the operator feedback status bits for test operation. <STOPTEST> also is controlled by <ABORTPUL.DOUT> which goes high if an abort condition becomes active. <PBDNTM.DOUT> goes high if the elapsed pump operation time exceeds the desired time and sets <STOPTEST> high.

4.3 MODICON PLC FUNCTIONS

The Modicon PLC is responsible for inputting data from the field instrumentation, providing an abort signal when the values of critical measurements exceed their abort limits, providing control signals to field instruments, providing timers and enable logic for pump operation, and sending data and status information to Genesis. Details of these functions will be presented in the following sections.

Access to and programming of the PLC is provided by the program Modsoft. Modsoft is run on Station 7 in the MiniDACS console and communicates with the PLC via a ModBus Plus link.

Using Modsoft, the PLC I/O configuration can be defined, the PLC registers can be allocated and named, and the ladder logic can be produced. All of this can be done off-line and later downloaded to the PLC, or can be done online in the PLC as it operates. The latter is not a wise policy for making permanent changes, but can be useful for debugging ladder logic.

Modsoft allows the ladder logic programmer to impose a structure on the ladder logic for ease of understanding. It allows the programmer to break the ladder logic into modules known as objects and to connect the objects using flow control logic. Each object can contain any number of ladder logic networks. This structure is converted by Modsoft to an equivalent flat non-structured form when the logic is downloaded to the PLC.

Modsoft has a documentation feature which allows information about the PLC configuration and ladder logic to be either saved to a file or printed.

4.3.1 Data Collection From the Field. The PLC is responsible for collecting data from the field instruments. These data enter the PLC through any of a number of Modicon I/O modules. There are several different types of modules which accept different types of input. The modules used in the system and their descriptions are listed below. Both input and output modules are listed in this table. The output modules are used for various control functions discussed in Section 4.3.2.

Table XXXVI. Modicon I/O modules.

Module	Description	Signals Accepted
B875	8-channel analog input	Configurable for various voltage or current input ranges
B827	32-channel digital input	24-V digital input
B885	ASCII/BASIC module	RS-232 serial ASCII data
B829	16-channel digital input	5-V TTL digital input
B883	Thermocouple module	Thermocouple types B, E, J, K, N, R, S, & T
B865	TTL Register input	5-V digital output
B824	16-chan. digital output	24-V digital output
B828	16-chan. digital output	5-V TTL digital output

Each of these modules has a physical location and a set of registers through which it communicates to the PLC. This location and the exact registers used for communication are specified in the configuration module of the Modsoft program. For all but the B885 ASCII/Basic module and the B883 thermocouple module, this is all that needs to be done in order for the PLC to have access to the data from these modules. Both the ASCII/Basic module and the thermocouple require additional ladder logic to set up and operate the module. The operation of these modules will be discussed in the next two sections.

Most of the measurements from the field enter the system through the B875 analog input module. This module can be set to accept inputs with differing

characteristics. Commonly used in this system are 1-5 V, 0-5 V and 4-20 mA signals. These inputs are digitized with 12 bits of resolution. This 12-bit value is stored in the lower order 12 bits of the Modicon register corresponding to that channel. The most significant bit of the same register is the out-of-range bit. The B875 module will set this bit if it detects an incoming signal which is out of the range specified when the module is set up. For example, if the module has been set to receive 1 to 5-V inputs and then receives an input of 0 Vs, it will set the out-of-range bit. This out-of-range bit is used for instrument failure detection, a topic which is discussed in Section 4.3.5.

4.3.2 Abort Functions. One of the primary monitoring functions of the Modicon 984 PLC in the MiniDACS system is to check for over- or under-range conditions on various safety parameters. These parameters are sensed by the 984 series I/O at drops. Once received by the PLC, these critical values are stored in 30xxx registers. These are two-byte registers that function as repositories for incoming analog data. Current values of the important parameters are now loaded in the PLC, and are ready for comparison with limit values. This comparison takes place in the ladder logic in the PLC and is of the form below in Fig. 8.

Fig. 8. Abort limit testing.

Register A is the current value register. Register B is the 40xxx register containing the limit to be compared with the current value. Register C is the 40xxx register containing the difference between the values in A and B. The subtract block actually has three outputs available for user logic. The top output is activated if A is greater than B. This is the case in which the limit abort logic is mainly interested. With this line high and the reset contact sense in the non-reset condition, the latched abort contact 202 is closed. When it closes, the contact sense in the bottom leg holds or latches the contact closed. Nothing can interrupt power to contact 202 except if the reset contact should close. The reset contact in the above diagram is a "not" of the true reset contact. This means that if the reset contact is open, the ladder element conducts power (is closed).

Values for the abort and alarm limits stored in the 4xxx registers are written from the MASFTTEST and MASFPUMP strategies.

When any of the latched abort contacts closes, a display for the MASFTTEST strategy called PUMPALRM shows the class of the abort along with the alarm limit value, the abort limit value, and a button to another screen with more detail on the abort.

4.3.3 I/O Health Status.

The PLC also provides information to Genesis about the health status of I/O modules in the system. The following four conditions must be met for a module to indicate good health:

- The slot has been configured in the Traffic Cop.
- The slot contains a module with the correct personality.
- Valid communications exist between the module and the J890.
- Valid communications exist between the J890 and the 984 PLC.

Module health is stored in registers in the Modicon PLC. Different PLC's use different registers. To standardize access to this information, a STAT block is added to the ladder logic. During runtime, the status information is moved to registers defined by the STAT block.

None of the drops are full of modules. Thus, not all of the status registers are of use. A STAT block register contains the I/O health of one crate (alternately referred to as a rack) of modules on a drop.

Display of the I/O health is available on the graphic IOSTATUS. Each point in the matrix is tied to the *PDIN* block bit corresponding to the module's health.

Good health is indicated by a green OK; bad health is indicated by a red BAD. On startup of Genesis, the graphic will show all the modules in bad health until one scan of transmit registers has been made. The scan rate of the transmit registers is 6 seconds.

A complete table of these PLC I/O status registers is given in the "I/O Health Status Implementation Table" in Appendix B.

To minimize the communication load, the status registers that correspond to existing racks are copied into a set of transmit registers. It is the transmit registers that Genesis views.

To streamline communication, the Genesis MASFTEST strategy gathers the transmit registers in as packed data.

4.4 Network Layout

The Gen-Net network is composed of eight Gen-Net network stations with ArcNet in a star configuration, as illustrated in Fig. 9.

Fig. 9. Gen-Net network configuration

The Genesis system allows peer-to-peer communications between Genesis applications. STATION5 serves data to all other stations on the Gen-Net. STATION7 is linked directly to STATION5 and share the database MASFTEST strategy running on STATION5. This station accomplishes this by running Remote Supervisory Software with the MASFTEST strategy on each station.

STATION5 and STATION8 use Gen-Net software to enable networking to a Runtime master station.

Fig.10. Network data flow.

Figure 10 shows the current network data flow.

Each station is addressed on the Gen-Net by the network card address on the Arc-Net. A station name is linked to a physical address in the Gen-Net software. Refer to Appendix H for details on the network layout.

Appendix A: Data Dictionary

The following are the instructions for creating a comprehensive Data Dictionary for a given Genesis strategy, using version 1.42 of the set of Microsoft Excel macros that were written for that purpose.

This describes the procedure for creating a single Excel database that combines the diverse information that is obtainable from the reports that the Genesis software is capable of producing. While these reports do provide the user with much information, it is output in a form which is difficult to use effectively because the individual reports are not ordered in a way that makes it easy to find information and because the information exists in multiple files. The aim of this procedure is to create a multilayered database ("outlined" in Excel language), using the capabilities of Excel (version 4.0) that is based on, and ordered by, tag name. The parameters and properties of each function block are on the same line with the tag name. These lines form "level 1" in the database. The lines following each tag name contain all of the connections to other blocks, to other nodes, to operator display screens, and to Report & Recipe (R&R) programs. These lines collectively comprise "level 2" of the database. Level 2 lines can be hidden from view until their information is needed, thus greatly simplifying the location of data.

The process will be elucidated using the MASFPUMP strategy as an example. The general format that follows is to briefly describe a setup, then provide a numbered step that is an extremely brief reminder of what is happening at that point. This is usually followed by salient details to more completely describe the step.

The choice of Excel was based on the author's familiarity with that product and the knowledge that it could handle the complexity of the operations to be performed. A similar procedure could doubtless be established to create the data dictionary in, say, dBASE-IV format. Recognize, however, that much effort has gone into the creation of Excel macros to automate the process described here as much as possible.

Creating All Necessary Genesis Reports

Before the Data Dictionary can begin to be constructed, all possible reports must have been generated from within Genesis.¹ In the Strategy Builder, create the "Database Report" (.DBR file) and "Connection Signal List Report" (.CIR file) for the

¹Your directory structure should be such that there is a 1-to-1 correspondence between strategies and associated files. That is, all files associated with a strategy should be in the same directory with the strategy, and different strategies should be in different directories (unless two strategies have the same set of displays and R&R files).

strategy using the Edit submenu. (Select the floppy disk icon; first one in the second row.)

1. (In DOS:) Start up Genesis.
2. (In Genesis:) Load the desired strategy into the Strategy Builder.
3. (In Genesis:) Right-mouse-click "Edit," and in the sub-menu, select the floppy disk icon to create the report files.

Now make sure that "Dynamic Connection Reports" (.GPR files) have been created for each of the display screens (.GRP files) linked to this strategy.

4. (In Genesis:) Start up the Display Builder (mouse-click on the drafting tools icon).

Note that you can get a list of all the displays by right-clicking on the floppy disk icon in the main Display Builder menu, then selecting the question mark icon. Also, it is important that you have the strategy loaded into the strategy builder before bringing up the displays; otherwise the Dynamic Connection Reports will have blanks where tag names should be!

5. (In Genesis:) For each of the displays, load it into the Display Builder, then right-mouse-click on the Edit icon and select the floppy disk icon (second row, fourth from left) to create the report.

Finally, create the dBASE-IV database (.DBF file) for the strategy using the DBTODBF utility. (This program is normally located in a \DBUTIL subdirectory.) This file will be imported into Excel to form "level 1" of the basic work sheet to which will be added all the other types of data. Successful completion of this step will result in a message something like "MOTOR.dbf Created with 223 records."

6. (In DOS:) > CD \GENESIS\MOTOR
> \GENESIS\DBUTIL\DBTODBF MOTOR

Creating the Initial Database of Tag Names

Note: All of the following steps are done from within Excel.¹

Start up the Excel application. If it comes up with "Sheet1" as the (blank) active work sheet, you may close it (that is, the work sheet) immediately. Now choose *Open* from the *File* menu. Make sure that the File Type in the dialog box is set to "MS Excel Files (*.XL*)." (It should already be set to this if you have just started up Excel.) Choose GEN_DD.XLM as the file to open. This file contains all the macros that create the Excel Data Dictionary database and add other types of data to it, based on the report files created above. If you have done this before, you may find GEN_DD.XLM in the list of four files at the bottom of the drop-down menu; selecting it from there is the easiest way to open the macro file. If this is the first time, you may have to change the directory to find this file; I keep it in \GENESIS\DOCS.²

7. Start up Excel and open file GEN_DD.XLM.

Type a **Control-a**³ to run the first macro ("GenDBF") and answer the questions posed by the dialog boxes. These inform the programs of the name of the version of the strategy and also allow you to supply the actual characteristics for Device and Node blocks. (This is necessary because Genesis does a poor and inconsistent job of reporting the parameters for these block types, and the macros need to correct for this to make the Data Dictionary consistent.) When the necessary information is supplied, the database is adjusted, the titles are put in, and the print headers are set up, and the file is renamed (to MOTOR_DD.XLS⁴) and saved.

8. Type **Control-a** (runs the GenDBF macro).

¹Version 4.0 of Excel for windows is assumed to be in use. The instructions assume a start-from-scratch execution of Excel. If the command line with which Excel is run includes the "/E" switch, the blank work sheet will not appear. The best way, however, is to supply the filename (GEN_DD.XLM) on the Excel execution line.

²Version 4.0 of Excel for windows is assumed to be in use. The instructions assume a start-from-scratch execution of Excel. If the command line with which Excel is run includes the "/E" switch, the blank work sheet will not appear. The best way, however, is to supply the filename (GEN_DD.XLM) on the Excel execution line.

³All the Control characters used by these macros are lower case. Note that Excel treats Control-a and Control-A (that is, Control-Shift-a) as separate and distinct keystrokes.

⁴This file is created by appending "_DD" to the first five characters of the strategy name and giving it an extension of ".XLS." If it was necessary to truncate characters from the strategy name to do this, the macro alerts you to that fact.

At the onset of execution of this and each succeeding macro, you have the option of minimizing (that is, iconizing) the Excel application or viewing the processing. The former option gets Excel out of the way so you can do something while the macro is running; the latter is useful if you are curious (or paranoid!) about what the macro does. It is difficult to predict (and nonintuitive) in which state the macro will run faster. (This first macro only takes a few seconds and the next only a few minutes; it becomes an issue with the third macro.) Timings for one hardware configuration and one strategy are given later in these instructions. If you elect to minimize, keep an eye on the icon; if you see it flashing, double-click on it to maximize it again, as this is an indication that there is something amiss.

At the conclusion of this macro (and each succeeding macro), you are given the opportunity to continue smoothly to the other macros. Electing this option is equivalent to stopping at this point, then running the next macro in line manually. Note, however, that there is no option to go back and revise data added with a macro earlier in the chain. The proper order of execution of the macros is indicated by the alphabetical order of the control character used to run the macro: Control-a first, then Control-b, and so on.

Adding the Connection Report Data to the Database

The process continues with the incorporation of the Connection Report data into the database just created. The data are supplied by the .CIR file generated by Genesis above. This file is imported into Excel and "normalized" to repair its errors and reduce its irregularities. It is saved as a separate worksheet (MOTOR_CD.XLS¹) that can be used to more easily find connection information. Another macro will pick out the connection data from MOTOR_CD.XLS for inclusion in the Data Dictionary.

There are problems here that are inherent to the formats Genesis uses in its reports. In the solutions to these problems that the Excel macros represent, there is a possibility of thoroughly destroying the database if things get out of synchranization. The macro checks for expected formats; if a format error occurs, please report it so that the macros can be modified to cure the problem.

If Excel is not running, activate it and open the macro file (GEN_DD.XLM) as above.

Run the macro ("GenCD") that thoroughly rearranges and reformats the Connection Report database by typing **Control-b**. Note that this assumes that the .CIR file is associated with the same version of the strategy from which the .DBF file came. Part of this process performs "translations" of tag names like "DEV 1" and "NODE 1"

¹This name is formed in the same manner as that for the Data Dictionary (*_DD.XLS).

using the names that are actually in the strategy for these blocks that you supplied when running the previous macro.

9. Type **Control-b** (reformats MOTOR.CIR and saves it as MOTOR_CD.XLS)

Next, merge the data from the Connection List Report into the Data Dictionary with the CRdata_to_DD macro, which is executed via Control-c. You may also simply continue on at the end of the previous macro, as explained above.

10. Type **Control-c** (merges MOTOR_CD.XLS into MOTOR DD.XLS)

Several checks occur at the beginning of the above macro, and you are again given a choice as to whether to want to minimize the application. This one takes longer to execute, so you may want to experiment with the View vs Minimize options. (On a 486 PC with a VESA bus, it took about 20% *longer* when minimized.) If you choose to iconize, you will see the name under the icon change back and forth as the data are shuffled from the connection database into the Data Dictionary.

Adding Dynamic Connection Report (Screen Display) Data to the Data Dictionary

Next, the data for connections from the strategy to the dynamic displays are added to the Data Dictionary using the macro "DispData_to_DD", run via **Control-D**. This macro makes a check of the files in the directory that houses the strategy to insure that all of the display files (*.GRP) have a corresponding report file (*.GPR). A warning is issued if the check fails; you may ignore the warning, but realize that this may mean that the Data Dictionary is incomplete. Another warning may occur if a tag name is listed in the Dynamic Connection Report but cannot be found in the Data Dictionary. You may ignore this warning also, but this can have more serious consequences, including crashing the running strategy when that item in the display is selected.

11. Type **Control-d** to add connection data from all displays to the Data Dictionary

For the MOTOR strategy, the time it took to add a given report file to the Data Dictionary varied from about 20 to 110 seconds, averaging just under a minute. This

¹This macro must take into account "features" (bugs?) in reporting parameters for Device I/O and node blocks as well as differences in .GPR files produced by Genesis 3.52 and 3.54. If later versions of Genesis are in use, and errors in this macro are encountered, please report them promptly.

amounts to about 1.5 seconds per data line added. This was measured *without* iconizing the application.

The Data Dictionary is saved after the addition of data from each .GPR file. If an error occurs during the processing, you may elect to halt the macro there. If you do so, the first thing you should do is to close the Data Dictionary work sheet *without* saving it, to discard the partially added data from the current .GPR file. After the problem is cured, you can come back to this macro. When you rerun it, it will tell you that some .GPR files have already been added. Here you can elect to continue, and the macro will search for other .GPR files that have not yet been added and, when it finds them, add their data to the Data Dictionary. Note, however, that you cannot go back and revise or replace the data from a .GPR file that has already been added.

Adding R&R References to the Data Dictionary

The next macro in the chain is "RRdata_to_DD," run with **Control-e**. This operates in a manner similar to the previous macro except that it extracts data from .RPS files rather than from .GPR files. Tag names in both executable and comment lines are recognized and the line on which they are referenced is noted in the Data Dictionary. If the tag name appears on a comment line (or in an in-line comment), that fact is noted along with the line number.

12. Type **Control-e** to add R&R references from all listings to the Data Dictionary

As with the previous macro, the Data Dictionary is saved after the addition of data from each .RPS file. If an error is encountered, take the same actions as described above. This macro has the same ability to figure out which files' data have been added and continue to add references from the remaining .RPS files.

Pay particular attention to warning messages that indicate that a tag name referenced in an R&R file cannot be found in the Data Dictionary. At best, this can mean that you have an obsolete file in your directory that is no longer called out in a Report Block. At worst, you have deleted a block in your strategy without making the corresponding change to the R&R file. This situation has the capability of crashing your running strategy!

The Data Dictionary is now "complete" as far as connections between and within the parts of a Genesis system are concerned. One more macro (described below) adds task assignments from a (manually established) database. If other data are to be included, the recommended way to do this is to insert a row just after the "Task(s):" row, put "Notes:" in the first column, and put whatever comments you want in the second column.

The following table shows, for the example MOTOR strategy (and also for the TEST strategy, version 2.24), the changes in size that the Data Dictionary undergoes as each macro is executed. There are 223 tag names in the strategy and 309 connections. There are 9 associated displays and 30 R&R files. The final Data Dictionary has an average of 11.7 data lines added below each tag name line and is about 150 pages long when printed. The table also shows the execution time for each of the macros (exclusive of time required for operator responses to dialog boxes). The column under the strategy name contains times noted with the "View" option selected and the following column's times are with the application minimized.

Adding Task Assignments to the Data Dictionary

The last macro in the chain is "_Tasks_to_DD", run with **Control-f**. This relies on the existence of a (manually created) work sheet called TASKS.XLS in the same directory as the strategy that lists the tag names along with the tasks and subtasks that the function block takes part in.

13. Type **Control-f** to add Task Assignments to the Data Dictionary.

The format of TASKS.XLS is fairly loose, but there are a few formatting details that the macro expects to find:

- Column 1 of some row near the top of the database (call it R_xC1) must contain "STRATEGY." In the next row must contain the name of the ($R_{x+1}C1$) strategy and the version number¹ should be in column 2 ($R_{x+1}C2$). (R_xC2 should contain "VERSION," but this is not checked.)
- Column 1 of the start of the data proper (call it R_yC1) must contain "TAG NAME". (R_yC2 should contain "TASK(S)," but this is not checked.) The data should immediately follow, with the tag name in column 1 and the task(s) to which it is devoted listed in column 2.

There are a few other formatting features that are suggested, but not required for the macro to run successfully:

- A heading at the top of the work sheet would be nice; something like "List of tasks associated with each function block" would do.

¹The version number may appear as a number or as text. To make it appear as text, prefix an apostrophe (") to it. If it left as a number, it needs to be left justified in the cell and formatted as "0.00".

- Multiple tasks should be separated with commas.
- Subtasks should be enclosed in square brackets following the main task to which they apply.
- Multiple subtasks should be separated by commas within the square brackets (instead of repeating the main task with a different subtask).
- The data itself (that is, Ry+1C1 through column 2 of the last row) should be defined¹ as "Database" so that a macro could insure that the database is sorted by tag name. (The row containing the column headers should not be included in the Database range.)

Checking Executable Equivalence of R&R Files

An additional macro (executed with Control-r) is included in the package that is not directly related to the Data Dictionary. This macro insures that two sets of R&R (.RPS) files are functionally identical by comparing only the executable parts of the files. It assumes that identical sets of .RPD files are contained in two directories (for which it prompts you), and then compares each in turn. The process ignores multiple spaces and tabs and all comments (including in-line comments). The comparison succeeds only if the executable statements are identical and in the same order.

¹In Excel, select the cells, then use the "Set Database" option on the "Data" menu.

Appendix B: PLC I/O Status Registers

The Modicon I/O health status alarms Genesis when a module is no longer in good health. The following four conditions must be met for a module to indicate good health:

In Section 4.3.5, the facility for Genesis determining the health of the I/O modules in the system was discussed. This included the conditions for good health, the STAT blocks used in the ladder logic to define the module health registers that are transmitted to Genesis, and the *PDIN* blocks in the Genesis strategy that receive them.

The following is a complete list of the PLC registers and their corresponding Genesis strategy variable names.

Table B-1. I/O Health Status Implementation Table						
Drop	Rack	Slot	STAT block Register	Transmit Register	DEV 4, GC11 PDIN	Output
2	1		40317	40108	D2R1	
		4				DO13
		5				DO12
		6				DO11
2	2		40318	40109	D2R2	
	3					DO14
		4				DO13

Appendix C: PLC Register List

The Modsoft program allows a symbol table to be created. This symbol table allows the programmer to assign symbolic names and comments to the registers used by the PLC. The symbol table is accessed under the Utility Menu of Modsoft. A hard copy print-out can be obtained by using the File I/O and Export menu choices once the symbol table has been called up.

The symbol table is essential for the ladder logic programmer. It is the definitive record of which PLC registers have been used and which are available for use. Any entry in the symbol table which has a symbolic name has been used by the PLC. If there is no entry in the symbol table for a register, or if there is a register entry without a symbolic name, that register is available for use.

It is essential that the symbol table be kept up to date. Any change which adds or deletes PLC registers (including adding I/O modules) must be reflected in the symbol table also.

000016	HRTIMOUT		HOUR TIMEOUT	
000020	WDTBAD	14.2.4.4	GENESIS-PLC COMMUNICATION FAIL	
000021	ABRTCOILF	14.2.4.5	COIL FOR ABORT - NEGATIVE LOGIC	
000022	ABORT_POSF	14.2.4.6	ABORT COIL - POSITIVE LOGIC	
000025	ST8COMFAF	14.2.4.9	ST8-PLC COMMUNICATION FAIL	
000166	PLSDONE			
000167	HF_ALM			
000168				
000169	FLOWABPOS		HI STRAIN FLOW METER CUT-OFF POS LOGIC	
000170	COPYENAB		ENABLE COPY OF CHS TO GENESIS I/O REGION	
000193	PMCLIMSW			
000200				
000213	WDTRESET		WATCH DOG TIMER FROM GENESIS	H1C0
000216	PLCBENF		LATCHED BUMP ENABLE	H1C3
000217	NOZERO		Disallows test timeout when time cleared	H1C4
000220	PLCWDF		PLC 1 SEC WATCHDOG TIMER RESET	G7C0.1
000221			G7C0.2	
000222			G7C0.3	
000223	T1OUT	PLC WD TIMER 1 OUTPUT		G7C0.4
000224	PLABORT	ABORT POSITIVE LOGIC		G7C0.5
000226			G7C0.7	
000227	HTEMPABRT	HIGH TEMPERATURE ABORT		G7C0.8
000228	PUMPABRT	PUMP PROBLEM ABORT		G7C0.9

000230		G7C0.11	
000231 STRABRT	STRAIN ABORT		G7C0.12
000232 HTEMP2ABRT	HIGH TEMP ABORT 2		G7C0.13
000233 T2OUT	PLC WD TIMER 2 OUTPUT		G7C0.14
000234		G7C0.15	
000235		G7C0.16	
000236		G7C1.1	
000237		G7C1.2	
000238 THRES_RLY	COIL FOR THRESHOLD		G7C1.3
000239		G7C1.4	
000240		G7C1.5	
000241 RSTCOIL		G3C0 G7C1.6	
000242 ST8WDRES	ST8 WATCHDOG TIMER RESET		G3C1 G7C1.7
000243 PBUMPTOUT	PUMP BUMP TIMEOUT ABORT		G3C2 G7C1.8
000244		G3C3 G7C1.9	
000245		G3C4 G7C1.10	
000246		G3C5 G7C1.11	
000247		G3C6 G7C1.12	
000248		G3C7 G7C1.13	
000249 BUMPENAB	BUMP ENABLE		G3C8 G7C1.14
000250 COMABRT	PLC COMM FAILURE		G3C9 G7C1.15
000251 A5ABRT	AF5000 ABORT		G3C10 G7C1.16
000252		G3C11 G7C2.1	
000253 MAP00001	MOISTURE IN PUMP ABORT		G3C12 G7C2.2
000254 ZAMPE143	CW LIMIT SWITCH ABORT		G3C13 G7C2.3
000255 ZAMPE144	CCW LIMIT SWITCH ABORT		G3C14 G7C2.4
000256 WLR12A01	LOW 12A-1 STRAIN ABORT		G3C15 G7C2.5
000262 WLR12A02	LOW 12A-2 STRAIN ABORT		G7C2.11
000263 WLR12A03	LOW 12A-3 STRAIN ABORT		G7C2.12
000300 TCPNO101	HIGH TEMP ABORT PUMP 101		G7C5.1
000303 TCPNO202	HIGH TEMP ABORT PUMP 202		G7C5.4
000304 PHR12A01	HIGH PUMP DISCHARGE PRESSURE ABORT		G7C5.5
000305		G7C5.6	
000306 TCR12A01	HIGH PUMP MOTOR OIL TEMP ABORT 1		G7C5.7
000307 TCR12A02	HIGH PUMP MOTOR OIL TEMP ABORT 2		G7C5.8
000312		G7C5.13	
000313 WCR12A01	HIGH PUMP COLUMN STRAIN ABORT 1		G7C5.14
000314 WCR12A02	HIGH PUMP COLUMN STRAIN ABORT 2		G7C5.15
000315 WCR12A03	HIGH PUMP COLUMN STRAIN ABORT 3		G7C5.16

000316 WCR12A04	HIGH PUMP COLUMN STRAIN ABORT 4	G7C6.1
000317	G7C6.2	
000325 VC232040	HIGH PUMP MOTOR CURRENT ABORT	G7C6.10
000326 VC232050	HIGH PUMP MOTOR SPEED ABORT	G7C6.11
000327	G7C6.12	
000328	G7C6.13	
000329	G7C6.14	
000330	G7C6.15	
000331 WLR12A04	LOW 12A-4 STRAIN ABORT	G7C6.16
000341 ZLMPE142	LOW PUMP COLUMN GAS PRESSURE ABORT	
G7C7.10		
000344 PLC1ON	G7C7.13	
000345 PLC2ON	G7C7.14	
000346 PLCOKF	1-PLC OK; 0-PLC PROBLEM	G7C7.15
000347 ZRMPE142	INSTRUMENT PROBLEM - ZIMPE142	G7C7.16
000372 OUTOFRNG	OUT OF RANGE FOR 0-5V CHANNELS	
000433 PRR12A01	INSTRUMENT PROBLEM PIR12A01	
000490 COMABRTEN	COM ABORT ANDED WITH TEST ENABLES	
G6C0.15		
000491 AF5ABRTEN	AF5000 PROBLM ABRT ANDED W/ TEST ENABLES	
G6C0.16		
000500		
000542 TZPNO202	OUT OF RANGE BIT	G6C4.3
000543 TZPNO101	OUT OF RANGE BIT	G6C4.4
000545 TZR12A01	OUT OF RANGE BIT	G6C4.6
000546 PYR12A01	OUT OF RANGE BIT	G6C4.7
000547 TZR12A02	OUT OF RANGE BIT	G6C4.8
000549 WZR12A02	OUT OF RANGE BIT	G6C4.10
000553 WZR12A01	OUT OF RANGE BIT	G6C4.14
000554 WZR12A03	OUT OF RANGE BIT	G6C4.15
000556 WZR12A04	OUT OF RANGE BIT	G6C5.1
000561 SZARE2	OUT OF RANGE BIT	G6C5.6
000562 SZARE1	OUT OF RANGE BIT	G6C5.7
000563 ZZMPE142	OUT OF RANGE BIT	G6C5.8
000564 PZ2PO506	OUT OF RANGE BIT	G6C5.9
000565 PZ2PO507	OUT OF RANGE BIT	G6C5.10
000566 MZICTC01	OUT OF RANGE BIT	G6C5.11
000567 PZTNO110	OUT OF RANGE BIT	G6C5.12
000568 PZTNO111	OUT OF RANGE BIT	G6C5.13
000569 XZR12AN1	OUT OF RANGE BIT	G6C5.14

000570 ZZMPE112	OUT OF RANGE BIT	
002015 ZIMPE144	PUMP OSCIL MOTOR LIMIT SWITCH CCW	G2C0.15
002016 ZIMPE143	PUMP OSCIL MOTOR LIMIT SWITCH CW	G2C0.16
002017 MIP00001	MOISTURE IN PUMP MOTOR OIL 1	G2C1.1
002033		
002034 PMPINRUN	PUMP MOTOR RUNNING INDICATOR	G2C2.2
002042 ABRT_POS	COIL FOR ABORT - POSITIVE LOGIC	G2C2.10
002043 PLCBEN	LATCHED BUMP ENABLE	G2C2.11
002044 PLCWD	PLC 1 sec watchdog reset	G2C2.12
002045 ST8COMFA	STATION 8 COMMUNICATION FAILURE	G2C2.13
002046 PLCOK	1-PLC OK; 0-PLC PROBLEM	G2C2.14
002047 A5ABORT	AF5000 PROBLEM	G2C2.15
002048 ST5COMFA	STATION 5 COMMUNICATION FAILURE	G2C2.16
002049 PMCALARM	PUMP MOTOR CURRENT ALARM	G2C3.1
002050 PDPALARM	PUMP DISCHARGE PRESSURE ALARM	G2C3.2
002051 PSPDALARM	PUMP SPEED ALARM	G2C3.3
002052		G2C3.4
010000 BATCOIL		
100001 MIP00001F	2.2.1.1 MOISTURE IN PUMP MOTOR OIL 1	
100002 ZIMPE143F	2.2.1.2 PUMP OSCIL MOTOR LIMIT SWITCH CW	
100003 ZIMPE144F	2.2.1.3 PUMP OSCIL MOTOR LIMIT SWITCH CCW	
100004	2.2.1.4	
100005	2.2.3.5	
100006	2.2.3.6	
100007	2.2.3.7	
100008	2.2.3.8	
100009	2.2.3.9	
100010	2.2.3.10	
100011	2.2.3.11	
100012	2.2.3.12	
100013	2.2.3.13	
100014	2.2.3.14	
100015	2.2.3.15	
100016	2.2.3.16	
100017	2.2.3.17	
100018 ESTOP	2.2.3.18 EMERGENCY STOP MONITOR	
100019	2.2.3.19	
100020	2.2.3.20	
100021	2.2.3.21	
100022	2.2.3.22	

100023	2.2.3.23	
100024	2.2.3.24	
100025	2.2.3.25	
100026	2.2.3.26	
100027	2.2.3.27	
100028	2.2.3.28	
100029	2.2.3.29	
100030	2.2.3.30	
100031	2.2.3.31	
100032	2.2.3.32	
100033	1.2.10.1	
100034	1.2.10.2	
100035	1.2.10.3	
100036	1.2.10.4	
100037	1.2.10.5	
100038	1.2.10.6	
100039	1.2.10.7	
100040	1.2.10.8	
100041	1.2.10.9	
100042	1.2.10.10	
100043	1.2.11.11	
100044	1.2.10.12	
100045	1.2.10.13	
100046	1.2.10.14	
100047	1.2.10.15	
100048	PMPINRUNF	1.2.10.16 PUMP MOTOR RUNNING INDICATOR
300001	MPICTC01F	2.1.4.1 INSTRUMENT CABINET TEMPERATURE
300002	TIPNO202F	2.1.4.2 PUMP DISCHARGE NOZZLE #1 TEMPERATURE
300003	TIPNO101F	2.1.4.3 PUMP DISCHARGE NOZZLE #2 TEMPERATURE
300004	SPARE3	2.1.4.4
300005	SPARE4	2.1.4.5
300006	SPARE5	2.1.4.6
300007	SPARE6	2.1.4.7
300008	PIR12A01F	2.1.4.8 PUMP PRESSURE
300009	TIR12A01F	2.1.6.1 PUMP MOTOR OIL TEMPERATURE A
300010	TIR12A02F	2.1.6.2 PUMP MOTOR OIL TEMPERATURE B
300011	SPARE7	2.1.6.3
300012	SPARE8	2.1.6.4

300013	2.1.5.5		
300014	2.1.5.6		
300015	PIPNO202F	2.1.5.7	PUMP DISCHARGE NOZZLE #1 PRESSURE-2
300016	TIPNO201F	2.1.5.8	PUMP DISCHARGE NOZZLE #1 TEMPERATURE-2
300017	2.1.6.1		
300018	2.1.6.2		
300019	2.1.6.3		
300020	FIPNO202F	2.1.6.4	PUMP DISCHARGE NOZZLE #1 FLOW-1
300021			
300022	PITNO110F	2.2.3.1	PUMP #2 NOZZLE TAP PRESSURE
300023	PITNO111F	2.2.3.2	PUMP #1 NOZZLE TAP PRESSURE
300024	SPARE1F	2.2.3.3	
300025	SPARE2F	2.2.3.4	
300026	XIR12AN1F	2.2.3.5	PUMP CASING VIBRATION
300027	ZIMPE142F	2.2.3.6	LOW PUMP COLUMN GAS PRESSURE
300028	PN2PO506F	2.2.3.7	PRESSURE GAUGE
300029	PN2PO507F	2.2.3.8	PRESSURE GAUGE
300030			
300031			
300032	WIR12A01F	1.1.6.1	PUMP SUPPORT COLUMN STRAIN #1
300033	WIR12A02F	1.1.6.2	PUMP SUPPORT COLUMN STRAIN #2
300034	WIR12A03F	1.1.6.3	PUMP SUPPORT COLUMN STRAIN #3
300035	WIR12A04F	1.1.6.4	PUMP SUPPORT COLUMN STRAIN #4
300281	ZIMPE112F		MIXER PUMP OSCILLATOR POSITION (B865)
300295	XIR12AN2F	14.2.5.7	PUMP SUPPORT COLUMN VIBRATION
400001	unused		
400075	TIMER5		ST8 WATCHDOG TIMER REGISTER 1
400076	TIMER6		ST8 WATCHDOG TIMER REGISTER 2
400077	TIMER7		
400078	MULTREG2		
400079	PMCALMHI		PUMP MOTOR CURR ALARM LIM (205/225*65535)
400100	TIMER		TIMER COUNT
400101	TIMER2		TIMER COUNT
400102	TIMER3		TIMER COUNT
400103	TIMER4		TIMER COUNT
400104	HOURENT		HOUR COUNT OF THE TEST
400108	D2R1STAT		DROP 2 RACK 1 STATUS H3C0
400109	D2R2STAT		DROP 2 RACK 2 STATUS H3C1
400110	D1R1STAT		DROP 1 RACK 1 STATUS H3C2

400203 HTEMPLIM	HIGH TEMPERATURE LIMIT	G4C0.4
400204 HTDPLIM	G4C0.5	
400205 HILIM	SET TO 4095	
400206 HPMOTLIM	HIGH PUMP MOTOR OIL TEMP LIMIT	G4C0.7
400207 LVFLLIM	LOW VENTILATION FLOW LIMIT	G4C0.8
400208 HPMCLIMF	HIGH PUMP MOTOR CURRENT LIMIT	G4C1.1
400209 HPDPLIM	HIGH PUMP DISCHARGE PRESS LIMIT	G4C1.2
400210 BUMPTLIMH	PUMP BUMP TIME LIMIT (HOURS)	G4C1.3
400211 CURALRM	PUMP MOTOR CURRENT ALARM LIMIT	G4C1.4
400212 BUMPTLIMF	PUMP BUMP TIME LIMIT (SECS)	G4C1.5
400213 HPSPDLIM	HIGH PUMP SPEED LIMIT	G4C1.6
400214 HPSPDALM	HIGH PUMP SPEED ALARM LIMIT	G4C1.7
400215 VR232020F	MIXER PUMP MOTOR VOLTAGE	G4C1.8
400216 VR232080F	ROTATIONAL MOTOR VOLTAGE	G4C2.1
400217 VR232100F	ROTATIONAL MOTOR CURRENT	G4C2.2
400218 VR232110F	ROTATIONAL MOTOR SPEED	G4C2.3
400219 VR232040F	MIXER PUMP MOTOR CURRENT	G4C2.4
400220 VR232050F	MIXER PUMP SPEED (RPM)	G4C2.5
400221	G4C2.6	
400222	G4C2.7	
400223 HPDPALM	PUMP DISCH. PRESS. ALARM LIMIT	G4C2.8
400224 HPCSLIM	HIGH PUMP COLUMN STRAIN LIMIT	G4C3.1
400225 SCRATCH	SCRATCH	G4C3.2
400234 HTMPLIM3	HIGH TEMP LIMIT FOR PUMP TEMPS	
400238 LPCSLIM	LOW PUMP COLUMN STRAIN LIMIT	
400252 LPCGPLIM	LOW PUMP COLUMN GAS PRESS LIMIT	G4C6.5
400253 HVFLLIM1	HIGH VENT FLOW LIMIT 1	G4C6.6
400254 HVFLLIM2	HIGH VENTILATION FLOW LIMIT 2	G4C6.7
400255 MULTREG	MOTOR CURR LIMIT (210/225*65535)	G4C6.8
400256 PMCHILIM	MOTOR CURR LIMIT (210/225*65535)	G4C7.1
400257 CURLIMTIM	CURRENT LIMIT DELAY TIMER	G4C7.2
400301 CONTSTAT	Controller Status	G4C12.6
400302 HSTBYSTAT	Hot Standby Status	G4C12.7
400303 CNTRLSTAT2	Controller Status 2	G4C12.8
400304 RIOSTAT	Remote I/O Status	G4C13.1
400305 CTRLSTOPST	Controller Stop State	G4C13.2
400306 NUMSEGS	Number of Ladder logic segs	G4C13.3
400307 EOLPTRADD	End of logic ptr address	G4C13.4
400310 RUNDEBUG	Run load debug status	G4C13.7
400311 NOTUSED	G4C13.8	

400312 SBD1R1	DROP 1 RACK 1 STATUS	G4C14.1
400313 SBD1R2	DROP 1 RACK 2 STATUS	G4C14.2
400314 SBD1R3	DROP 1 RACK 3 STATUS	G4C14.3
400315 SBD1R4	DROP 1 RACK 4 STATUS	G4C14.4
400316 SBD1R5	DROP 1 RACK 5 STATUS	G4C14.5
400317 SBD2R1	DROP 2 RACK 1 STATUS	G4C14.6
400318 SBD2R2	DROP 2 RACK 2 STATUS	G4C14.7
400319 SBD2R3	DROP 2 RACK 3 STATUS	G4C14.8
400320 SBD2R4	DROP 2 RACK 4 STATUS	G4C15.1
400321 SBD2R5	DROP 2 RACK 5 STATUS	G4C15.2
400322 SBD3R1	DROP 3 RACK 1 STATUS	G4C15.3
400323 SBD3R2	DROP 3 RACK 2 STATUS	G4C15.4
400324 SBD3R3	DROP 3 RACK 3 STATUS	G4C15.5
400325 SBD3R4	DROP 3 RACK 4 STATUS	G4C15.6
400326 SBD3R5	DROP 3 RACK 5 STATUS	G4C15.7
400612 ZC_STATF	ZERO CHECK STATUS 1=OK 0=ERROR	
400615 ZC_ARF	ZERO CHECK AR PARTIAL PRESSURE	
400654 PCR12A01F	PUMP DISCHARGE PRESSURE MINUS BASELINE	
400682 SCRATCH1	SCRATCH REGISTER	
400683 SCRATCH2	TIMER REGISTER	
400684 SCRATCH3	TIMER REGISTER	
400691 PDPBASEF	PUMP DISCHARGE PRESSURE BASELINE	
402001 TIPNO101	PUMP DISCHARGE NOZZLE #2 TEMP-1	G1C0.1
402002 TIPNO102	PUMP DISCHARGE NOZZLE #2 TEMPERATURE-2	
G1C0.2		
402003 TIR12A02	PUMP MOTOR OIL TEMPERATURE #2	G1C0.3
402004 TIR12A01	PUMP MOTOR OIL TEMPERATURE #1	G1C0.4
402005 TIPNO201	PUMP DISCHARGE NOZZLE #1 TEMPERATURE-2	
G1C0.5		
402006 ZIMPE142	LOW PUMP COLUMN GAS PRESSURE	G1C0.6
402007 PIR12A01	PUMP PRESSURE	G1C0.7
402008 TIPNO202	PUMP DISCHARGE NOZZLE #1 TEMPERATURE-1	
G1C0.8		
402009 PIPNO102	PUMP DISCHARGE NOZZLE #2 PRESSURE-2	G1C1.1
402010 PIPNO202	PUMP DISCHARGE NOZZLE #1 PRESSURE-2	G1C1.2
402011 PIPNO101	PUMP DISCHARGE NOZZLE #2 PRESSURE-1	G1C1.3

402012 PIPNO201	PUMP DISCHARGE NOZZLE #1 PRESSURE-1	G1C1.4
402013 FIPNO201	PUMP DISCHARGE NOZZLE #1 FLOW-2	G1C1.5
402014 FIPNO102	PUMP DISCHARGE NOZZLE #2 FLOW-2	G1C1.6
402015 FIPNO202	PUMP DISCHARGE NOZZLE #1 FLOW-1	G1C1.7
402016 FIPNO101	PUMP DISCHARGE NOZZLE #2 FLOW-1	G1C1.8
402017 PITNO111	PUMP #2 NOZZLE TAP PRESSURE	G1C2.1
402018 PITNO110	PUMP #1 NOZZLE TAP PRESSURE	G1C2.2
402019 PN2PO506	PRESSURE GAUGE	
402020 PN2PO507	PRESSURE GAUGE	
402021 MPICTC01	INSTRUMENT CABINET TEMPERATURE	
402022 SPARE2	SPARE PITNO111	
402023 SPARE1	SPARE PITNO110	
402025 SPARE3F		G1C3.1
402026 SPARE4F		G1C3.2
402027 SPARE5F		G1C3.3
402028 SPARE6F		G1C3.4
402029 SPARE7F	SPARE7 = TSR12A01	G1C3.5
402030 SPARE8F	SPARE8 = TSR12A02	G1C3.6
402070 XIR12AN1	PUMP CASING VIBRATION	G1C8.6
402071 WIR12A04	PUMP SUPPORT COLUMN STRAIN #4 315 DEG	G1C8.7
402072 XIR12AN2	PUMP SUPPORT COLUMN VIBRATION	G1C8.8
402073 WIR12A01	PUMP SUPPORT COLUMN STRAIN #1 45 DEG	G1C9.1
402074 WIR12A03	PUMP SUPPORT COLUMN STRAIN #3 225 DEG	G1C9.2
402080 WIR12A02	PUMP SUPPORT COLUMN STRAIN #2 135 DEG	G1C9.8
402129 PCR12A01	PUMP DISCHARGE PRESSURE MINUS BASELINE	
H2C0.1		
402130 PDPBASE	PUMP DISCHARGE PRESSURE BASELINE	H2C0.2
402131 ZIMPE112	MIXER PUMP OSCILLATOR POSITION (B865)	
402134 ZC_STAT	ZERO CHECK STATUS 1=OK 0=ERROR	
402137 ZC_AR	ZERO CHECK ARE PARTIAL PRESSURE	
402217 HPMCALM	PUMP MOTOR CURRENT ALARM LIMIT	H2C11.1
402218 HPMCLIM	PUMP MOTOR CURRENT ABORT LIMIT	H2C11.2
402219 PLCPDPAL	PUMP DISCH. PRESS. ALARM LIMIT	H2C11.3
402220 PLCPDPAB	PUMP DISCH. PRESS. ABORT LIMIT	H2C11.4
402221 PLCPSLIM	PUMP SPEED ABORT LIMIT	H2C11.5

402222 PLCSPDAL	PUMP SPEED ALARM LIMIT	H2C11.6
402223 BUMPTLMT	PUMP BUMP TIME LIMIT HOURS	H2C11.7
402224 BUMPTLIM	PUMP BUMP TIME LIMIT MINUTES/SECONDS	H2C11.8
402225 VR232050	PUMP SPEED	H2C12.1
402226 VR232080	ROTATIONAL MOTOR VOLTAGE	H2C12.2
402227 VR232100	ROTATIONAL MOTOR CURRENT	H2C12.3
402228 VR232110	ROTATIONAL MOTOR SPEED	H2C12.4
402229 VR232040	PUMP MOTOR CURRENT	H2C12.5
402230 VR232020	MIXER PUMP MOTOR VOLTAGE	H2C12.6
402231 PLCPM CAB	PLC PUMP MOTOR CURRENT LIMIT	H2C12.7
402232 PLCPM CAL	PLC PUMP MOTOR CURRENT ALARM LIMIT	
H2C12.8		

Appendix D: Report and Recipe File Listings

Report and Recipe (R&R) code is controlled by the state of bits in the strategy. These bits are connected to *REPORT* blocks which reference the code as a source file. Please refer to Section 4.2.8 of System Parameters to see which *REPORT* blocks refer to each piece of R&R code for the MOTOR strategy.

R&R code is composed of a command and function set provided by the R&R software option. These commands and functions must follow a syntax format explained in the R&R Option document provided by Iconics.

Following is a description of each R&R code's function for the MOTOR strategy and when it is executed. Refer to the code itself for details on how the functions are carried out.

R&R file: PBSETVAL.RPS

REPORT block: PBREPORT

Controlled by: PBSETAND.DOUT Set high when setting the test values is executed.

Purpose: This code will download the desired test values to the critical parameters in the MASFPUMP strategy.

Related task: Set test values

All other Report and Recipe code functions are related to creating and selecting predefined tests and is only applicable for the MINIDACS-1 system.

Appendix E: Key Macros and State Fields

The MASFPUMP strategy utilizes a key macro definition file to redefine the auto/manual function. The text file EXTRA.KMS was created to disable <F9> and add <Alt-F9> as the auto/manual macro. The text file is compiled with KEYMAC EXTRA to create EXTRA.KML. This compiled file must be contained in the MASFPUMP directory where the MASFPUMP strategy is contained. The following is the listing of EXTRA.KMS:

```
DISMOV1=ON(DISMOVE.OUT).  
DISMOV0=OFF(DISMOVE.OUT).  
CHKCLR1=ON(CHKCOLOR.OUT).  
SETTES1=ON(SETTEST.OUT).  
RESPTIM=DOWNLD_PT(0,PBHR.OUT) DOWNLD_PT(0,PBMIN.OUT)  
DOWNLD_PT(0,PBSEC.OUT)  
DOWNLD_PT(0,PMPSPDAL.OUT) DOWNLD_PT(0,PMPSPDAB.OUT)  
DOWNLD_PT(0,DO5DEV.SETP) DOWNLD_PT(0,DO6DEV.SETP).
```

```
[F9]=DISABLE.  
[Alt-F9]=A/M().
```

State fields are useful to tie words to analog or discrete values. The text file STATES.SFS was modified to create three different state fields for the displays linked to the MASFPUMP strategy:

- <Enable-Disable Move> is used to indicate and control the enabling of the position motor.

If a state field is revised (by editing STATES.SFS and compiling it with the command STATECMP STATES), the display connection in the display builder must be redone in order for the changes to come into effect.

Appendix F: Station Display List

The following list of displays are currently implemented on STATION8 and are dynamically linked to the MASFPUMP strategy. (See Section 4.1.2 for a list and discussion of the MASFTTEST strategy displays).

Table F-1. Station Displays	
Display	Functions
CURDPRLM	Pump motor current and discharge pressure alarm and abort calculation display.
DMPROB	Position operation problem indication display.
MASFMENU	Main menu for display selection for pump or position motor control.
MASFPOSM	Position motor control display.
MASFPUMP	Pump motor control display.
PBENPROB	Test enable problem indication display.
POSPROB	Position selection problem indication display.
PSPROB	Test start problem indication display.
SETPROB	Test values set problem indication display.

Appendix G: Hardware Configurations

The following is a list of all cards and their settings on all computer stations in the Mini-DACS. The addresses below ("Addr." column) are in hexadecimal. The printer ports are multiplexed; the port on the multiplexer is noted in the "Destination" column; the ARCnet star configuration ports are also noted here. For the Gateway 2000 computers, "(m)" in the Slot column indicates the motherboard.

There are other standard IRQs that are being used by the system in addition to those noted in the tables: IRQ 0 (system timer), IRQ 1 (keyboard), IRQ 2 (cascade from higher IRQs), IRQ 6 (floppy disk), IRQ 8 (clock), IRQ 13 (80486DX), and IRQ 14 (hard disk).

Computer #5 (Texas Microsystem, in the Mini-DACS)

"Station 5", running the Genesis MASFTEST strategy

Slot	Card	Port(s)	IRQ	Addr.	Destination
1	(empty)				
2	(empty)				
3	SMC ARCnet	BNC	5	2E0	ARCnet hub (port 5)
4	(empty)				
5	Texas Micro	15-pin ♀ 9-pin ♀			V2VGA Video; Shinko multiplx. not used
6	(empty)				
7	CPU (80486)	9-pin ♂ 25-pin ♀			not used not used
8	Magic I/O	9-pin ♂ 25-pin ♀	7	378	not used Genesis C key; Black Box data switch; Proprinter #3 (port 1)
9	I/O jumper	9-pin ♂ 25-pin ♀	4 3	3F8 2F8	Dual ABC box (A) mouse
10	(empty)				
11	(empty)				
12	(empty)				
13	(empty)				
14	(empty)				

Computer #7 (Texas Microsystem, in the Mini-DACS)
 "Station 7"

Slot	Card	Port(s)	IRQ	Addr.	Destination
1	(empty)				
2	(empty)				
3	(empty)				
4	(empty)				
5	Texas Micro	15-pin ♀ 9-pin ♀			V2VGA Video; Shinko multiplx. not used
6	(empty)				
7	CPU (80486)	9-pin ♂ 25-pin ♀			not used not used
8	Magic I/O	9-pin ♂ 25-pin ♀	7	378	not used Genesis RT key; Black Box data switch; Proprinter #3 (port 2)
9	I/O jumper	9-pin ♂ 25-pin ♀	4 3	3F8 2F8	mouse Dual ABC box (C)
10	SMC ARCnet	BNC	5	2E0	ARCnet hub (port 7)
11	(empty)				
12	(empty)				
13	(empty)				
14	(empty)				

Computer #8 (Texas Microsystem, in the Mini-DACS)

"Station 8", running the Genesis MASFPUMP strategy

Slot	Card	Port(s)	IRQ	Addr.	Destination
1	(empty)				
2	(empty)				
3	(empty)				
4	Everex I/O	9-pin ♂ 25-pin ♀	7	278	not used Proprinter #8
5	Texas Micro	15-pin ♀ 9-pin ♀			V2VGA Video; Shinko multiplx. not used
6	(empty)				
7	CPU (80486)	9-pin ♂ 25-pin ♀			not used not used
8	Magic I/O	9-pin ♂ 25-pin ♀	7	378	not used Genesis C key; LaserJet printer multiplx. (port 8)
9	I/O jumper	9-pin ♂ 25-pin ♀	4 3	3F8 2F8	Dual ABC box (B) mouse
10	(empty)				
11	SMC ARCnet	BNC	5	2E0	ARCnet hub (port 8)
12	(empty)				
13	(empty)				
14	(empty)				

Appendix H: Network Configuration Settings

Station name: STATION5

Function: Runtime Master Station

Network settings

Memory Buffer Address: D980

I/O Port Address: 2e0

IRQ: 5

Data Check Mode: CRC-16

Network address: 5

Node fail time: 10

Watchdog message rate: 2

Performance monitor rate: 1

Network scan time: 1

Message retry count: 1

Transmit Timeout: 2

Primary ACK setting: 20

Net Alarm Squelch After Startup: 0

Net Alarm Squelch During Startup: 10

Net Alarm Buffer size: 4096

Transmit Buffer Full Level: 80

RX Buffers: 32,32,16,16,32

Rename Duplicates on file transfer: Yes

Alarm broadcasts: ENABLE

Station name: STATION7

Function: Local RSS

Network settings

Memory Buffer Address: D980

I/O Port Address: 2e0

IRQ: 5

Data Check Mode: CRC-16

Network address: 7

Node fail time: 10

Watchdog message rate: 2

Performance monitor rate: 1

Network scan time: 1

Message retry count: 1

Transmit timeout: 2

Primary ACK Setting: 20
Network point database size: 300
RSS master identification: MANUAL
RSS auto reconfiguration: DISABLED
RSS Master Node Name: STATION5

Station name: STATION8

Function: Runtime Master

Network settings

Memory Buffer Address: D980
I/O Port Address: 2e0
IRQ: 5
Data Check Mode: CRC-16
Network address: 8
Node fail time: 10
Watchdog message rate: 2
Performance monitor rate: 1
Network scan time: 1
Message retry count: 1
Transmit Timeout: 2
Primary ACK setting: 20
Net Alarm Squelch After Startup: 0
Net Alarm Squelch During Startup: 10
Net Alarm Buffer size: 512
Transmit Buffer Full Level: 10
RX Buffers: 8,8,4,4,8
Rename Duplicates on file transfer: Yes
Alarm broadcasts: DISABLE

Appendix I: Computer Configurations and Software Versions

See Appendix H for a general description of the functions and network setup parameters (ArcNet VO Port, Memory Address, and IRQ) of the stations in the network.

All stations are running DOS version 6.0 and Netroom 3 version 3.02.

The current versions of the Genesis strategies are 1.01 for the MASFTTEST strategy (running in Station 5) and 1.01 for the MASFTTEST strategy (running in Station 8).

The versions of Iconics software that are in use are:

- Genesis (GEN-6C and GEN-RT)—3.72
- Remote Supervisory System (RSS)—3.72
 - Gen-Net—3.64
- Report & Recipe option (RRCOMBO)—3.62

The directory organization on the computers is the same for the following directories:

- \ (Root directory)—AUTOEXEC.BAT and CONFIG.SYS system boot files
 - \DOS—MS-DOS system files
 - \EXPERT—Mouse driver
- \Netroom3- Expanded Memory Manager

Where directories differ between stations, the following table shows what those directories contain.

Station Name	Directory	Contents
STATION5	\GENESIS	Genesis system, Gen-Net, AF5000+/Genesis driver, Modicon/Genesis driver, RRCOMBO option, Help system files
	\MASFTTEST	MASFTTEST strategy files, related displays, R&R code, key macro files, state field files, startup batch files
STATION7	\GENESIS	RSS software, Gen-Net, AF5000+/Genesis driver, Modicon/Genesis driver, RRCOMBO option, Help system files

\MASFTEST	MASFTEST strategy files, related displays, R&R code, key macro files, state field files, startup batch files
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Station Name	Directory	Contents
STATION8	\GENESIS	Genesis system, Gen-Net, AF5000+/Genesis driver, Modicon/Genesis driver, RRCOMBO option, Help system files
	\MASFPUMP	MOTOR strategy files, related displays, R&R code, key macro files, state field files, startup batch files
	\TEST	TEST strategy files, related displays, R&R code, key macro files, state field file startup batch files

Appendix J: Software License Agreements

The following is a list of the commercial software that is used in the MiniDACS system.

Company	Software	Version(s)
Helix	Netroom3	3.02
Kensington Microware, Ltd.	Expert Mouse	n/a
Iconics, Inc.	Genesis Control Series	3.72
Iconics, Inc.	GenNet	3.64
Iconics, Inc.	Remote Supervisory Station	3.72
Modicon, Inc	Modsoft	2.1
Microsoft Corp.	MS-DOS	6.0

Appendix K: MASFTTEST GENESIS DATA DICTIONARY

Genesis Strategy Data Dictionary

 Display Connections
Added for:

 Sorted by
Tagname

Strategy: MASTEST

Version: 1.01

 Report & Recipe
References Added for
RPS files named:

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
#435		0.5	sor								
Inputs:	INP1	From:	T0000.DOUT							Conn. No.:	21
	INP2		T0200.DOUT								22
	INP3		T0400.DOUT								23
	INP4		T0600.DOUT								24
	INP5		T0800.DOUT								25
	INP6		T1000.DOUT								26
Outputs:	DOUT	To:	FILENAME.DIN1							Conn. No.:	27
Tasks:											
#474		0.5	sor								
Inputs:	INP1	From:	T1200.DOUT							Conn. No.:	30
	INP2		T1400.DOUT								31
	INP3		T1600.DOUT								32
	INP4		T1800.DOUT								51
	INP5		T2000.DOUT								52
	INP6		T2200.DOUT								53
Outputs:	DOUT	To:	FILENAME.DIN2							Conn. No.:	28
Tasks:											
A5ABORT	PUMP PROBLEM ALARM	0.5	DIGITAL INPUT								Y
Inputs:	EVAL	From:	G2C2.DO15							Conn. No.:	58
Outputs:	(None)										
Tasks:											
ABRTCOIL		0.5	DIGITAL INPUT								Y
Inputs:	EVAL	From:	G2C2.DO10							Conn. No.:	39
Outputs:	(None)										
Display/Item:	PUMPALRM / CIRCLE RAD=19	Param:	DOUT							Pos:	[659, 76]
Tasks:											
COMABRT	PLC COMMUNICATION FAIL BIT	2	DIGITAL OUTPUT								
Inputs:	INP	From:	PLCCOMFA.DOUT							Conn. No.:	66

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Outputs: DOUT		To: DEV 1.MODBS+ GROUP 3 #9						Conn. No.: 115			
Tasks:											
D1SEC		0.5	TON								
Inputs: CONT		From: XFERPULS.DOUT						Conn. No.: 74			
Outputs: DOUT		To: PUMP.STRT						Conn. No.: 91			
DOUT		STRAIN.STOP						160			
Tasks:											
D2SEC		0.5	TON								
Inputs: CONT		From: XFERPULS.DOUT						Conn. No.: 161			
Outputs: DOUT		To: STRAIN.STRT						Conn. No.: 159			
Tasks:											
DELAYON		2	TON								
Inputs: CONT		From: ON.DOUT						Conn. No.: 101			
Outputs: DOUT		To: DOWNLIMS.DIN1						Conn. No.: 102			
R&R File: SETLIMS.RPS (line 12 Comment)		Line: ; DELAYON.DOUT									
Tasks:											
DEV 1	[PLC I/O; Driver = Modicon 984]		I/O HARDWARE								
Inputs: MODBS+ GROUP 3 #0		From: RSTCOIL.DOUT						Conn. No.: 100			
MODBS+ GROUP 3 #9		COMABRT.DOUT						115			
MODBS+ GROUP 4 #0		G4C0.PAOT						118			
MODBS+ GROUP 4 #3		G4C3.PAOT						119			
MODBS+ GROUP 4 #4		G4C4.PAOT						120			
Outputs: MODBS+ GROUP 1 #0		To: G1C0.MEAS						Conn. No.: 20			
MODBS+ GROUP 1 #2		G1C2.MEAS						40			
MODBS+ GROUP 1 #8		G1C8.MEAS						67			
MODBS+ GROUP 1 #9		G1C9.MEAS						68			
MODBS+ GROUP 2 #0		G2C0.PDIN						97			
MODBS+ GROUP 2 #1		G2C1.PDIN						98			
MODBS+ GROUP 2 #2		G2C2.PDIN						99			
MODBS+ GROUP 2 #3		G2C3.PDIN						143			
MODBS+ GROUP 5 #0		G5C0.PDIO						126			
MODBS+ GROUP 5 #1		G5C1.PDIO						127			
MODBS+ GROUP 5 #2		G5C2.PDIO						128			
MODBS+ GROUP 6 #2		G6C2.PDIO						121			
MODBS+ GROUP 6 #3		G6C3.PDIO						122			
MODBS+ GROUP 7 #1		G7C1.PDIO						72			
MODBS+ GROUP 7 #2		G7C2.PDIO						125			

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	MODBS+ GROUP 8 #0		G8C0.PDIQ								123
	MODBS+ GROUP 8 #1		G8C1.PDIQ								124
Tasks:											
DEV 2	[PLC I/O; Driver = Modicon 984]		I/O HARDWARE								
	Inputs: MODBS+ GROUP 1 #0		From: WDTRESET.DOUT							Conn. No.:	47
	Outputs: MODBS+ GROUP 2 #0		To: H2C0.MEAS							Conn. No.:	94
	MODBS+ GROUP 2 #11		H2C11.MEAS								116
	MODBS+ GROUP 2 #12		H2C12.MEAS								117
	MODBS+ GROUP 3 #0		H3C0.PDIN								95
	MODBS+ GROUP 3 #1		H3C1.PDIN								96
	MODBS+ GROUP 3 #2		H3C2.PDIN								162
Tasks:											
DOWNLIMS	SET ABORT LIMITS	6	REPORT								
	Inputs: DIN1		From: DELAYON.DOUT							Conn. No.:	102
	Outputs: (None)										
	R&R File: SETLIMS.RPS (line 14 Comment)		Line: ; Reference: DOWNLIMS.SOURCE_FILE1								
Tasks:											
FAST		2	jk FLIP FLOP								
	Inputs: INP1		From: TE-OR-BE.DOUT							Conn. No.:	111
	INP2		SLOWDOWN.DOUT								109
	Outputs: DOUT		To: PUMP.PSEL							Conn. No.:	110
	DOUT		STRAIN.PSEL								158
	Display/Item: PUMPALRM / SYMBOL :2		Param: QNOT				Type: SELECTION LIST			Pos: [308, 10]	
	PUMPALRM / SYMBOL :2		DOUT				SELECTION LIST			[310, 13]	
Tasks:											
FILENAME	CREATE HISTORY FILENAME	0.5	REPORT								
	Inputs: DIN1		From: #435.DOUT							Conn. No.:	27
	DIN2		#474.DOUT								28
	DIN3		PULON.DOUT								88
	Outputs: (None)										
	R&R File: HISTFNAM.RPS (line 16 Comment)		Line: ; Reference: FILENAME.SOURCE_FILE1								
	HISTFNAM.RPS (line 17 Comment)		; FILENAME.SOURCE_FILE2								
	HISTFNAM.RPS (line 18 Comment)		; FILENAME.SOURCE_FILE3								
Tasks:											
G1C0		1	PAK ANALOG INPUT								
	Inputs: MEAS		From: DEV 1.MODBS+ GROUP 1 #0							Conn. No.:	20
	Outputs: AO1		To: TIPNO101.EVAL							Conn. No.:	0

TAGNAME	DESCRIPTION	SCAN	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANGE	LIM. HIGH	LIM. LOW	ALM HIGH	ALM LOW	DIG ALARM
A01	TTPNO101.EVAL										
A03	TIR12A02.EVAL										
A03	TTR12A02.EVAL										
A04	TIR12A01.EVAL										
A04	TTR12A01.EVAL										
A06	ZIMPE142.EVAL										
A07	PIR12A01.EVAL										
A08	TIPNO202.EVAL										
A08	TTPNO202.EVAL										
FAIL	PLCCOMFA.EVAL										
Tasks:											
G1C2	PAK ANALOG INPUT	1									
Inputs: MEAS	From: DEV 1.MODBS+ GROUP 1 #2										
Outputs: A01	To: PITNO111.EVAL										
A02	PITNO110.EVAL										
A03	PN2PO506.EVAL										
A04	PN2PO507.EVAL										
A05	MPIC01.EVAL										
A06	SPARE2.EVAL										
A07	SPARE1.EVAL										
Tasks:											
G1C8	PAK ANALOG INPUT	1									
Inputs: MEAS	From: DEV 1.MODBS+ GROUP 1 #8										
Outputs: A06	To: XIR12AN1.EVAL										
A07	WIR12A04.EVAL										
Tasks:											
G1C9	PAK ANALOG INPUT	1									
Inputs: MEAS	From: DEV 1.MODBS+ GROUP 1 #9										
Outputs: A01	To: WIR12A01.EVAL										
A02	WIR12A03.EVAL										
A08	WIR12A02.EVAL										
Tasks:											
G2C0	PAK DIGITAL INPUT	1									
Inputs: PDIN	From: DEV 1.MODBS+ GROUP 2 #0										
Outputs: DO15	To: ZIMPE144.EVAL										
DO16	ZIMPE143.EVAL										

Genesis Strategy Data Dictionary											
TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANGE	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Tasks:											NNNNNNNN NNNNNNNN
G2C1		1	PAK DIGITAL INPUT								
Inputs: PDIN		From: DEV 1.MODBS+ GROUP 2 #1						Conn. No.:		98	
Outputs: DO1		To: MIP00001.EVAL						Conn. No.:		50	
Tasks:											NNNNNNNN NNNNNNNN
G2C2		0.5	PAK DIGITAL INPUT								
Inputs: PDIN		From: DEV 1.MODBS+ GROUP 2 #2						Conn. No.:		99	
Outputs: DO10		To: ABRTCOIL.EVAL						Conn. No.:		39	
DO11		PLCBEN.EVAL								73	
DO12		PLCWD.INP								156	
DO13		ST8COMFA.EVAL								57	
DO14		PLCOK.EVAL								92	
DO15		A5ABORT.EVAL								58	
DO16		ST5COMFA.EVAL								144	
DO2		PMPINRUN.EVAL								93	
Tasks:											NNNNNNNN NNNNNNNN
G2C3		0.5	PAK DIGITAL INPUT								
Inputs: PDIN		From: DEV 1.MODBS+ GROUP 2 #3						Conn. No.:		143	
Outputs: DO1		To: PMCALARM.EVAL						Conn. No.:		141	
DO3		PSPALARM.EVAL								142	
Tasks:											
G4C0		2	PAK ANALOG OUTPUT								
Inputs: AI6		From: HILIM.OUT						Conn. No.:		34	
AI7		HPMOTLIM.OUT								35	
Outputs: PAOT		To: DEV 1.MODBS+ GROUP 4 #0						Conn. No.:		118	
Tasks:											
G4C3		2	PAK ANALOG OUTPUT								
Inputs: AI1		From: HPCSLIM.OUT						Conn. No.:		36	
Outputs: PAOT		To: DEV 1.MODBS+ GROUP 4 #3						Conn. No.:		119	
Tasks:											
G4C4		2	PAK ANALOG OUTPUT								
Inputs: AI3		From: HTEMLIM.OUT						Conn. No.:		17	
AI7		LPCSLIM.OUT								70	
Outputs: PAOT		To: DEV 1.MODBS+ GROUP 4 #4						Conn. No.:		120	

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Tasks:											
G5C0		1	PAK DIGITAL I/O								YYYYYYYYY YYYYYYY
Inputs: PDIO		From: DEV 1.MODBS+ GROUP 5 #0						Conn. No.:		126	
Outputs: DO14		To: HPCSABRT.INP1						Conn. No.:		78	
DO15		HPCSABRT.INP2								79	
DO16		HPCSABRT.INP3								80	
Display/Item:	PUMPALRM / PROCESS POINT	Param:	DO7	Type: COLOR ACTION			Pos: [718,671]				
	PUMPALRM / PROCESS POINT		DO8	COLOR ACTION			[718,629]				
	PUMPALRM / SYMBOL :3		DO7	COLOR ACTION			[20,671]				
	PUMPALRM / SYMBOL :3		DO8	COLOR ACTION			[20,629]				
	PUMPALRM / PROCESS POINT		DO7	COLOR ACTION			[808,671]				
	PUMPALRM / PROCESS POINT		DO8	COLOR ACTION			[808,629]				
	PUMPALRM / SYMBOL :3		DO4	COLOR ACTION			[20,587]				
	PUMPALRM / PROCESS POINT		DO4	COLOR ACTION			[808,587]				
	PUMPALRM / SYMBOL :3		DO1	COLOR ACTION			[20,544]				
	PUMPALRM / PROCESS POINT		DO1	COLOR ACTION			[808,544]				
	PUMPALRM / PROCESS POINT		DO4	COLOR ACTION			[718,587]				
	PUMPALRM / PROCESS POINT		DO1	COLOR ACTION			[718,544]				
	PUMPALRM / SYMBOL :3		DO14	COLOR ACTION			[20,249]				
	PUMPALRM / PROCESS POINT		DO14	COLOR ACTION			[718,249]				
	PUMPALRM / PROCESS POINT		DO14	COLOR ACTION			[808,249]				
	PUMPALRM / SYMBOL :3		DO15	COLOR ACTION			[20,207]				
	PUMPALRM / PROCESS POINT		DO15	COLOR ACTION			[718,207]				
	PUMPALRM / PROCESS POINT		DO15	COLOR ACTION			[808,207]				
	PUMPALRM / SYMBOL :3		DO16	COLOR ACTION			[20,165]				
	PUMPALRM / PROCESS POINT		DO16	COLOR ACTION			[718,165]				
	PUMPALRM / PROCESS POINT		DO16	COLOR ACTION			[808,165]				
Tasks:											
G5C1		1	PAK DIGITAL I/O								YYYYYYYYY YYYYYYY
Inputs: PDIO		From: DEV 1.MODBS+ GROUP 5 #1						Conn. No.:		127	
Outputs: DO1		To: HPCSABRT.INP4						Conn. No.:		81	
DO16		LPCSABRT.INP1								82	
Display/Item:	PUMPALRM / SYMBOL :3	Param:	DO10	Type: COLOR ACTION			Pos: [20,755]				
	PUMPALRM / SYMBOL :3		DO11	COLOR ACTION			[20,798]				
	PUMPALRM / PROCESS POINT		DO10	COLOR ACTION			[718,756]				

Genesis Strategy Data Dictionary											
TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	PUMPALRM / PROCESS POINT		DO11		COLOR ACTION				[718,799]		
	PUMPALRM / PROCESS POINT		DO10		COLOR ACTION				[808,755]		
	PUMPALRM / PROCESS POINT		DO11		COLOR ACTION				[808,798]		
	PUMPALRM / SYMBOL :3		DO16		COLOR ACTION				[20,123]		
	PUMPALRM / SYMBOL :3		DO1		COLOR ACTION				[20,123]		
	PUMPALRM / PROCESS POINT		DO16		COLOR ACTION				[718,123]		
	PUMPALRM / PROCESS POINT		DO1		COLOR ACTION				[718,123]		
	PUMPALRM / PROCESS POINT		DO16		COLOR ACTION				[808,123]		
	PUMPALRM / PROCESS POINT		DO1		COLOR ACTION				[808,123]		
Tasks:											
G5C2		1	PAK DIGITAL I/O								YYYYYYYY YYYYYY
Inputs: PDIO		From: DEV 1.MODBS+ GROUP 5 #2						Conn. No.: 128			
Outputs: (None)											
Tasks:											
G6C2		6	PAK DIGITAL I/O								YYYYYYYY YYYYYY
Inputs: PDIO		From: DEV 1.MODBS+ GROUP 6 #2						Conn. No.: 121			
Outputs: (None)											
Tasks:											
G6C3		6	PAK DIGITAL I/O								YYYYYYYY YYYYYY
Inputs: PDIO		From: DEV 1.MODBS+ GROUP 6 #3						Conn. No.: 122			
Outputs: (None)											
Tasks:											
G7C1		1	PAK DIGITAL I/O								YYYYYYYY YYYYYY
Inputs: PDIO		From: DEV 1.MODBS+ GROUP 7 #1						Conn. No.: 72			
Outputs: (None)											
Tasks:											
G7C2		1	PAK DIGITAL I/O								YYYYYYYY YYYYYY
Inputs: PDIO		From: DEV 1.MODBS+ GROUP 7 #2						Conn. No.: 125			
Outputs: DO11		To: LPCSABRT.INP4						Conn. No.: 85			
DO12		LPCSABRT.INP2						83			
DO5		LPCSABRT.INP3						84			
Display/Item: PUMPALRM / SYMBOL :3		Param: DO2		Type: COLOR ACTION				Pos: [20,713]			

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	PUMPALRM / SYMBOL :5		DO3		COLOR ACTION				[20,333]		
	PUMPALRM / SYMBOL :5		DO4		COLOR ACTION				[20,291]		
	PUMPALRM / SYMBOL :3		DO5		COLOR ACTION				[20,249]		
	PUMPALRM / PROCESS POINT		DO5		COLOR ACTION				[718,249]		
	PUMPALRM / PROCESS POINT		DO5		COLOR ACTION				[808,249]		
	PUMPALRM / SYMBOL :3		DO11		COLOR ACTION				[20,207]		
	PUMPALRM / PROCESS POINT		DO11		COLOR ACTION				[718,207]		
	PUMPALRM / PROCESS POINT		DO11		COLOR ACTION				[808,207]		
	PUMPALRM / SYMBOL :3		DO12		COLOR ACTION				[20,165]		
	PUMPALRM / PROCESS POINT		DO12		COLOR ACTION				[718,165]		
	PUMPALRM / PROCESS POINT		DO12		COLOR ACTION				[808,165]		
Tasks:											
G8C0		6	PAK DIGITAL I/O								YYYYYYYY YYYYYY
	Inputs: PDIO		From: DEV 1.MODBS+ GROUP 8 #0						Conn. No.:	123	
	Outputs: DO10		To: WZR12A02.INP1						Conn. No.:	134	
	DO14		WZR12A01.INP1							135	
	DO15		WZR12A03.INP1							136	
	DO3		TZPNO202.INP1							129	
	DO4		TZPNO101.INP1							130	
	DO6		TZR12A01.INP2							131	
	DO7		PYR12A01.INP1							132	
	DO8		TZR12A02.INP2							133	
Tasks:											
G8C1		6	PAK DIGITAL I/O								YYYYYYYY YYYYYY
	Inputs: PDIO		From: DEV 1.MODBS+ GROUP 8 #1						Conn. No.:	124	
	Outputs: DO1		To: WZR12A04.INP1						Conn. No.:	137	
	DO8		ZZMPE142.INP2							138	
Tasks:											
GO		30	pulse								
	Inputs: (None)										
	Outputs: DOUT		To: GO.INP1						Conn. No.:	29	
	R&R File: HISTFNAM.RPS (line 52)		Line: @SET(GO.OUT,1)								
Tasks:											
H2C0		1	PAK ANALOG INPUT								
	Inputs: MEAS		From: DEV 2.MODBS+ GROUP 2 #0						Conn. No.:	94	

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	Outputs: AO3		To: ZIMPE112.EVAL								Conn. No.: 44
	Tasks:										
H2C11		1	PAK ANALOG INPUT								
	Inputs: MEAS		From: DEV 2.MODBS+ GROUP 2 #11								Conn. No.: 116
	Outputs: AO3		To: PLCPDPAL.EVAL								Conn. No.: 37
	AO4		PLCPDPAB.EVAL								38
	AO5		PLCPSLIM.EVAL								41
	AO6		PLCSPDAL.EVAL								140
	Tasks:										
H2C12		1	PAK ANALOG INPUT								
	Inputs: MEAS		From: DEV 2.MODBS+ GROUP 2 #12								Conn. No.: 117
	Outputs: AO1		To: VR232050.EVAL								Conn. No.: 54
	AO2		VR232080.EVAL								55
	AO3		VR232100.EVAL								75
	AO4		VR232110.EVAL								76
	AO5		VR232040.EVAL								77
	AO6		VR232020.EVAL								103
	AO7		PLCPMCAB.EVAL								113
	AO8		PLCPMCAL.EVAL								114
	Tasks:										NNNNNNNN NNNNNNNN
H3C0	DROP 2 RACK 1 I/O HEALTH	6	PAK DIGITAL INPUT								
	Inputs: PDIN		From: DEV 2.MODBS+ GROUP 3 #0								Conn. No.: 95
	Outputs: (None)										
	Display/Item: IOSTATUS / TEXT="OK" DOT		Param: DO13				Type: SELECTION LIST				Pos: [529,543]
	IOSTATUS / TEXT="OK" DOT		DO11				SELECTION LIST				[529,467]
	Tasks:										NNNNNNNN NNNNNNNN
H3C1	DROP 2 RACK 2 I/O HEALTH	6	PAK DIGITAL INPUT								
	Inputs: PDIN		From: DEV 2.MODBS+ GROUP 3 #1								Conn. No.: 96
	Outputs: (None)										
	Display/Item: IOSTATUS / TEXT="OK" DOT		Param: DO16				Type: SELECTION LIST				Pos: [589,667]
	IOSTATUS / TEXT="OK" DOT		DO15				SELECTION LIST				[589,627]
	IOSTATUS / TEXT="OK" DOT		DO14				SELECTION LIST				[589,587]
	Tasks:										NNNNNNNN NNNNNNNN
H3C2	DROP1 RACK 1 I/O HEALTH STATUS	6	PAK DIGITAL INPUT								

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Inputs: PDIN		From: DEV 2.MODBS+ GROUP 3 #2						Conn. No.: 162			
Outputs: (None)											
Display/Item: IOSTATUS / TEXT="OK" DOT		Param: DO11		Type: SELECTION LIST			Pos: [414,466]				
Tasks:											
HILIM	SET TO 4095	2	ANALOG INPUT		4095	0			0	0	
Inputs: (None)											
Outputs: OUT		To: G4C0.AI6						Conn. No.: 34			
R&R File: SETLIMS.RPS (line 22)		Line: @SET(HILIM.EVAL,4095) ; Should always be set to 4095.									
Tasks:											
HPCSABRT		6	sor								
Inputs: INP1		From: G5C0.DO14						Conn. No.: 78			
INP2		G5C0.DO15						79			
INP3		G5C0.DO16						80			
INP4		G5C1.DO1						81			
Outputs: DOUT		To: PCSABRT.INP1						Conn. No.: 86			
Tasks:											
HPCSALM		6	sor								
Inputs: INP1		From: WIR12A01.HALM						Conn. No.: 59			
INP2		WIR12A02.HALM						60			
INP3		WIR12A03.HALM						61			
INP4		WIR12A04.HALM						62			
Outputs: (None)											
Tasks:											
HPCSLIM	PUMP COLUMN STRAIN ABORT LIM1	2	ANALOG INPUT		684	-684			0	0	
Inputs: (None)											
Outputs: OUT		To: G4C3.AI1						Conn. No.: 36			
Display/Item: PUMPALRM / PROCESS POINT		Param: OUT		Type: PROCESS POINT			Pos: [718,249]				
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT			[718,249]				
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT			[718,207]				
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT			[718,207]				
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT			[718,165]				
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT			[718,165]				
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT			[718,123]				
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT			[718,123]				
R&R File: SETLIMS.RPS (line 25)		Line: @SET(HPCSLIM.EVAL,194) ; High strain guage abort.									
Tasks:											
HPMOTLIM	HIGH MOTOR OIL TEMP ABORT LIM	2	ANALOG INPUT	DEG F	392	32			0	0	

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Inputs: (None)											
Outputs: OUT		To: G4C0.A17						Conn. No.: 35			
Display/Item:	PUMPALRM / PROCESS POINT	Param: OUT		Type: PROCESS POINT			Pos: [718,671]				
	PUMPALRM / PROCESS POINT	OUT		PROCESS POINT			[718,671]				
	PUMPALRM / PROCESS POINT	OUT		PROCESS POINT			[718,629]				
	PUMPALRM / PROCESS POINT	OUT		PROCESS POINT			[718,629]				
R&R File: SETLIMS.RPS (line 24)		Line: @SET(HPMOTLIM.EVAL,230) ; High motor oil tempearture abort.									
Tasks:											
HTEMLIM	HIGH NOZZLE TEMP ABORT LIMIT	2	ANALOG INPUT	DEG F	932	32			0	0	
Inputs: (None)											
Outputs: OUT		To: G4C4.A13						Conn. No.: 17			
Display/Item:	PUMPALRM / PROCESS POINT	Param: OUT		Type: PROCESS POINT			Pos: [718,587]				
	PUMPALRM / PROCESS POINT	OUT		PROCESS POINT			[718,587]				
	PUMPALRM / PROCESS POINT	OUT		PROCESS POINT			[718,544]				
	PUMPALRM / PROCESS POINT	OUT		PROCESS POINT			[718,544]				
R&R File: SETLIMS.RPS (line 23)		Line: @SET(HTEMPLIM.EVAL,150) ; High nozzle temperature abort.									
Tasks:											
LPCSABRT		6	sor								
Inputs: INP1		From: G5C1.DO16						Conn. No.: 82			
	INP2	G7C2.DO12						83			
	INP3	G7C2.DO5						84			
	INP4	G7C2.DO11						85			
Outputs: DOUT		To: PCSABRT.INP2						Conn. No.: 87			
Tasks:											
LPCSALM		6	sor								
Inputs: INP1		From: WIR12A01.LALM						Conn. No.: 63			
	INP2	WIR12A02.LALM						64			
	INP3	WIR12A03.LALM						65			
	INP4	WIR12A04.LALM						69			
Outputs: (None)											
Tasks:											
LPCSLIM		2	ANALOG INPUT		684	-684			0	0	
Inputs: (None)											
Outputs: OUT		To: G4C4.A17						Conn. No.: 70			
R&R File: SETLIMS.RPS (line 26)		Line: @SET(LPCSLIM.EVAL,-194) ; Low strain guage abort.									
Tasks:											
MIP00001	MOISTURE IN PUMP MOTOR OIL 1	1	DIGITAL INPUT								Y

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Inputs: EVAL		From: G2C1.DO1									Conn. No.: 50
Outputs: (None)											
Display/Item:	PUMP / CIRCLE RAD=9	Param:	DOUT	Type:	COLOR ACTION	Pos:	[172,532]				
	PUMPALRM / SYMBOL :3		DOUT		COLOR ACTION		[20,713]				
	PUMPALRM / PROCESS POINT		DOUT		PROCESS POINT		[841,713]				
	PUMPALRM / PROCESS POINT		DOUT		PROCESS POINT		[841,713]				
	PUMPALRM / PROCESS POINT		DOUT		COLOR ACTION		[841,713]				
Tasks:											
MOLIMERR		1	sor								
Inputs: INP1		From: ZIMPE143.DOUT									Conn. No.: 1
INP2		ZIMPE144.DOUT									3
Outputs: (None)											
Display/Item:	PUMP / CIRCLE RAD=13	Param:	DOUT	Type:	COLOR ACTION	Pos:	[702,819]				
Tasks:											
MPICTC01	MIXER PUMP INSTR. CABINET TEMP	1	ANALOG INPUT	DEG F	932	32			80	60	
Inputs: EVAL		From: G1C2.AO5									Conn. No.: 12
Outputs: (None)											
Display/Item:	PUMPALRM / PROCESS POINT	Param:	LALV	Type:	PROCESS POINT	Pos:	[538,502]				
	PUMPALRM / PROCESS POINT		LALV		PROCESS POINT		[538,502]				
	PUMPALRM / PROCESS POINT		LALM		COLOR ACTION		[538,502]				
	PUMPALRM / PROCESS POINT		HALV		PROCESS POINT		[628,502]				
	PUMPALRM / PROCESS POINT		HALV		PROCESS POINT		[628,502]				
	PUMPALRM / PROCESS POINT		HALM		COLOR ACTION		[628,502]				
	PUMPALRM / PROCESS POINT		OUT		PROCESS POINT		[808,502]				
	PUMPALRM / PROCESS POINT		OUT		PROCESS POINT		[808,502]				
	PUMPALRM / PROCESS POINT		HALM		COLOR ACTION		[808,502]				
	PUMPALRM / PROCESS POINT		LALM		COLOR ACTION		[808,502]				
	PUMPALRM / SYMBOL :3		HALM		COLOR ACTION		[20,502]				
	PUMPALRM / SYMBOL :3		LALM		COLOR ACTION		[20,502]				
Tasks:											
OFF	ALWAYS OFF	0.5	DIGITAL INPUT								N
Inputs: (None)											
Outputs: (None)											
Tasks:											
ON	ALWAYS ON	30	DIGITAL INPUT								N
Inputs: (None)											
Outputs: DOUT		To: DELAYON.CONT									Conn. No.: 101

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	DOUT		PULON.INP1							89	
Tasks:											
PCSABRT		6	sor								
Inputs:	INP1		From: HPCSABRT.DOUT						Conn. No.:	86	
	INP2		LPCSABRT.DOUT							87	
Outputs: (None)											
Tasks:											
PIR12A01	VOLUTE PRESSURE	1	ANALOG INPUT	PSIA	100	0			0	0	
Inputs:	EVAL		From: G1C0.AO7						Conn. No.:	6	
Outputs:	HALM		To: PZR12A01.INP2						Conn. No.:	108	
	LALM		PZR12A01.INP1							107	
Display/Item:	PUMP / PROCESS POINT		Param: OUT				Type: PROCESS POINT		Pos: [740,380]		
	PUMPOPS / TREND WINDOW		OUT				TREND WINDOW		[33,485]		
Tasks:											
PITNO110	PUMP DISCHARGE NOZZLE #2 PRE	1	ANALOG INPUT	PSIG	60	-10			0	0	
Inputs:	EVAL		From: G1C2.AO2						Conn. No.:	9	
Outputs: (None)											
Display/Item:	PUMP / PROCESS POINT		Param: OUT				Type: PROCESS POINT		Pos: [742, 17]		
	PUMPOPS / TREND WINDOW		OUT				TREND WINDOW		[351,485]		
Tasks:											
PITNO111	PUMP DISCHARGE NOZZLE #1 PRE	1	ANALOG INPUT	PSIG	60	-10			0	0	
Inputs:	EVAL		From: G1C2.AO1						Conn. No.:	8	
Outputs: (None)											
Display/Item:	PUMP / PROCESS POINT		Param: OUT				Type: PROCESS POINT		Pos: [96, 17]		
	PUMPOPS / TREND WINDOW		OUT				TREND WINDOW		[351,485]		
Tasks:											
PLCBEN	LATCHED BUMP ENABLE FROM PLC	0.5	DIGITAL INPUT								N
Inputs:	EVAL		From: G2C2.DO11						Conn. No.:	73	
Outputs:	DOUT		To: TE-OR-BE.INP1						Conn. No.:	71	
Tasks:											
PLCCOMFA	PLC COMMUNICATIONS FAILURE	0.5	DIGITAL INPUT								Y
Inputs:	EVAL		From: G1C0.FAIL						Conn. No.:	19	
Outputs:	DOUT		To: COMABRT.INP						Conn. No.:	66	
	DOUT		PLCFAIL2.INP3							157	
Tasks:											
PLCFAIL	FAILURE OF PLC COMMUNICATION	0.5	DIGITAL INPUT								Y
Inputs:	EVAL		From: PLCFAIL2.DOUT						Conn. No.:	151	

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Outputs: (None)											
Tasks:											
PLCFAIL2	WATCH PLC FAILURE	0.5	OR								N
Inputs: INP1		From: PLCWDON.DOUT						Conn. No.:		152	
INP2		PLCWDOFF.DOUT								153	
INP3		PLCCOMFA.DOUT								157	
Outputs: DOUT		To: PLCFAIL.EVAL						Conn. No.:		151	
Tasks:											
PLCOK	1 - PLC OK; 0 - PLC PROBLEM	0.5	DIGITAL INPUT								N
Inputs: EVAL		From: G2C2.DO14						Conn. No.:		92	
Outputs: (None)											
Tasks:											
PLCPDPAB	HI PUMP DISCHARGE PRESS ABTLI	1	ANALOG INPUT	PSI	2400.55	0			0	0	
Inputs: EVAL		From: H2C11.AO4						Conn. No.:		38	
Outputs: (None)											
Tasks:											
PLCPDPAL	PUMP DISCHARGE PRESS ALARM L	1	ANALOG INPUT	PSI	2400.55	0			0	0	
Inputs: EVAL		From: H2C11.AO3						Conn. No.:		37	
Outputs: (None)											
Tasks:											
PLCPMCAB	HIGH PUMP MOTOR CURRENT ABR	1	ANALOG INPUT	AMPS	225	0			0	0	
Inputs: EVAL		From: H2C12.AO7						Conn. No.:		113	
Outputs: (None)											
Display/Item: PUMPALRM / PROCESS POINT		Param: OUT		Type: PROCESS POINT		Pos: [718,756]					
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT		[718,756]					
Tasks:											
PLCPMCAL	PUMP MOTOR CURRENT ALARM VA	1	ANALOG INPUT	AMPS	225	0			0	0	
Inputs: EVAL		From: H2C12.AO8						Conn. No.:		114	
Outputs: (None)											
Display/Item: PUMPALRM / PROCESS POINT		Param: OUT		Type: PROCESS POINT		Pos: [628,755]					
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT		[628,755]					
Tasks:											
PLCPSLIM	PUMP SPEED LIMIT FROM PLC	1	ANALOG INPUT	RPM	1200	0			0	0	
Inputs: EVAL		From: H2C11.AO5						Conn. No.:		41	
Outputs: (None)											
Display/Item: PUMPALRM / PROCESS POINT		Param: OUT		Type: PROCESS POINT		Pos: [718,799]					
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT		[718,799]					

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Tasks:											
PLCSPDAL	PUMP SPEED ALARM LIMIT	1	ANALOG INPUT	RPM	1200	0			0	0	
Inputs: EVAL		From: H2C11.AO6						Conn. No.: 140			
Outputs: (None)											
Display/Item: PUMPALRM / PROCESS POINT		Param: OUT		Type: PROCESS POINT			Pos: [628,798]				
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT			[628,798]				
Tasks:											
PLCWD	WATCH DOG FROM PLC	0.1	NOT								N
Inputs: INP		From: G2C2.DO12						Conn. No.: 156			
Outputs: DOUT		To: PLCWDOFF.CONT						Conn. No.: 155			
QNOT		PLCWDON.CONT						154			
Tasks:											
PLCWDOFF	WATCH DOG ON PLC FOR OFF	0.25	TON								
Inputs: CONT		From: PLCWD.DOUT						Conn. No.: 155			
Outputs: DOUT		To: PLCFAIL2.INP2						Conn. No.: 153			
Tasks:											
PLCWDON	WATCH DOG ON PLC FOR ON	0.25	TON								
Inputs: CONT		From: PLCWD.QNOT						Conn. No.: 154			
Outputs: DOUT		To: PLCFAIL2.INP1						Conn. No.: 152			
Tasks:											
PMCALARM	PUMP MOTOR CURRENT ALARM	0.5	DIGITAL INPUT								Y
Inputs: EVAL		From: G2C3.DO1						Conn. No.: 141			
Outputs: (None)											
Display/Item: PUMP / SYMBOL :2		Param: DOUT		Type: COLOR ACTION			Pos: [199,597]				
PUMPALRM / SYMBOL :3		DOUT		COLOR ACTION			[20,755]				
PUMPALRM / PROCESS POINT		DOUT		COLOR ACTION			[628,755]				
PUMPALRM / PROCESS POINT		DOUT		COLOR ACTION			[808,755]				
Tasks:											
PMPINRUN	PUMP IN RUN SIGNAL	0.5	DIGITAL INPUT								N
Inputs: EVAL		From: G2C2.DO2						Conn. No.: 93			
Outputs: (None)											
Tasks:											
PN2PO506	MIXER PUMP SHROUD N2 PRESSU	1	ANALOG INPUT	PSIG	15	0			14.9	7	
Inputs: EVAL		From: G1C2.AO3						Conn. No.: 10			
Outputs: (None)											
Display/Item: PUMP / PROCESS POINT		Param: OUT		Type: PROCESS POINT			Pos: [100,260]				
PUMP / SYMBOL :2		HALM		COLOR ACTION			[180,259]				

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	PUMP / SYMBOL :2		LALM		COLOR ACTION				[180,259]		
	PUMPALRM / PROCESS POINT		LALV		PROCESS POINT				[538,460]		
	PUMPALRM / PROCESS POINT		LALV		PROCESS POINT				[538,460]		
	PUMPALRM / PROCESS POINT		LALM		COLOR ACTION				[538,460]		
	PUMPALRM / PROCESS POINT		HALV		PROCESS POINT				[628,460]		
	PUMPALRM / PROCESS POINT		HALV		PROCESS POINT				[628,460]		
	PUMPALRM / PROCESS POINT		HALM		COLOR ACTION				[628,460]		
	PUMPALRM / PROCESS POINT		OUT		PROCESS POINT				[808,460]		
	PUMPALRM / PROCESS POINT		OUT		PROCESS POINT				[808,460]		
	PUMPALRM / PROCESS POINT		HALM		COLOR ACTION				[808,460]		
	PUMPALRM / PROCESS POINT		LALM		COLOR ACTION				[808,460]		
	PUMPALRM / SYMBOL :3		HALM		COLOR ACTION				[20,460]		
	PUMPALRM / SYMBOL :3		LALM		COLOR ACTION				[20,460]		
Tasks:											
PN2PO507	MIXER PUMP LEG N2 PRESSURE	1	ANALOG INPUT	PSIG	30	0			29.9	24	
Inputs: EVAL				From: G1C2.AO4							
Outputs: (None)				Conn. No.: 11							
Type: PROCESS POINT											
Pos: [740,260]											
Type: COLOR ACTION											
Pos: [630,259]											
Type: COLOR ACTION											
Pos: [630,259]											
Type: PROCESS POINT											
Pos: [538,418]											
Type: PROCESS POINT											
Pos: [538,418]											
Type: COLOR ACTION											
Pos: [538,418]											
Type: PROCESS POINT											
Pos: [628,418]											
Type: PROCESS POINT											
Pos: [628,418]											
Type: PROCESS POINT											
Pos: [808,418]											
Type: PROCESS POINT											
Pos: [808,418]											
Type: COLOR ACTION											
Pos: [808,418]											
Type: COLOR ACTION											
Pos: [808,418]											
Type: COLOR ACTION											
Pos: [20,418]											
Type: COLOR ACTION											
Pos: [20,418]											
Tasks:											
PSPALARM	PUMP SPEED ALARM	0.5	DIGITAL INPUT								Y
Inputs: EVAL				From: G2C3.DO3							
Outputs: (None)				Conn. No.: 142							
Type: COLOR ACTION											
Pos: [199,637]											

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	PUMPALRM / SYMBOL :3		DOUT								
	PUMPALRM / PROCESS POINT		DOUT								
	PUMPALRM / PROCESS POINT		DOUT								
	Tasks:										
PULCOIL		2	pulse								
	Inputs: (None)										
	Outputs: DOUT		To: PULCOIL.INP1								
	Tasks:										
PULON		30	pulse								
	Inputs: INP1		From: ON.DOUT								
	Outputs: DOUT		To: FILENAME.DIN3								
	R&R File: HISTFNAM.RPS (line 14 Comment)		Line: PULON.DOUT								
	Tasks:										
PUMP	PUMP HISTORY	0.5	HISTORY								
	Inputs: PSEL		From: FAST.DOUT								
	STOP		XFERPULS.DOUT								
	STRT		D1SEC.DOUT								
	Outputs: (None)										
	R&R File: HISTFNAM.RPS (line 50)		Line: @SET(PUMP.FNAM,YSTR + MSTR + DSTR + HSTR + "PUMP")								
	Tasks:										
PYR12A01	INSTRUMENT PROBLEM - PIR12A01	6	OR								Y
	Inputs: INP1		From: G8C0.DO7								
	Outputs: (None)										
	Tasks:										
PZR12A01	INSTRUMENT PROBLEM - PIR12A01	6	OR								Y
	Inputs: INP1		From: PIR12A01.LALM								
	INP2		PIR12A01.HALM								
	Outputs: (None)										
	Tasks:										
RSTCOIL	RESET PLC ABORT COIL	0.5	DIGITAL OUTPUT								
	Inputs: EVAL		From: PULCOIL.DOUT								
	Outputs: DOUT		To: DEV 1.MODBS+ GROUP 3 #0								
	Tasks:										
SLOWDOWN		1	TON								
	Inputs: CONT		From: TE-OR-BE.QNOT								
	Outputs: DOUT		To: FAST.INP2								
	Tasks:										

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	LOW	RANG	HIGH	LIM.	LIM.	LOW	HIGH	ALM	ALM	DIG ALARM
SPARE1	SPARE 1 CHANNEL SIGNAL	1	ANALOG INPUT	PSIG	60	-10				0	0			
Inputs: EVAL From: G1C2.A07														
Outputs: (None)														
Tasks:														
SPARE2	SPARE 2 CHANNEL SIGNAL	1	ANALOG INPUT	PSIG	60	-10				0	0			
Inputs: EVAL From: G1C2.A06														
Outputs: (None)														
Tasks:														
ST5COMFA		0.5	DIGITAL INPUT											Y
Inputs: EVAL From: G2C2.D016														
Outputs: (None)														
Tasks:														
ST8COMFA	STATION8 COMM FAILURE ALARM	0.5	DIGITAL INPUT											Y
Inputs: EVAL From: G2C2.D013														
Outputs: (None)														
Tasks:														
STRAIN	STRAIN GUAGE DATA LOGGING	0.5	HISTORY											
Inputs: PSEL From: FAST.DOUT														
STOP D1SEC.DOUT														
STRT D2SEC.DOUT														
Outputs: (None)														
R&R File: HISTFNAM.RPS (line 51) Line: @SET(STRAIN.FNAM,YSTR + MSTR + DSTR + HSTR + "STRN")														
Tasks:														
T0000	DATA LOGGING TIMER 0000	0.5	TIMER											
Inputs: (None)														
Outputs: DOUT To: #435.INP1														
Tasks:														
T0200	DATA LOGGING TIMER 0200	0.5	TIMER											
Inputs: (None)														
Outputs: DOUT To: #435.INP2														
Tasks:														
T0400	DATA LOGGING TIMER 0400	0.5	TIMER											
Inputs: (None)														
Outputs: DOUT To: #435.INP3														
Tasks:														
T0600	DATA LOGGING TIMER 0600	0.5	TIMER											
Inputs: (None)														

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Outputs: DOUT		To: #435.INP4									Conn. No.: 24
Tasks:											
T0800	DATA LOGGING TIMER 0800	0.5	TIMER								
Inputs: (None)											
Outputs: DOUT		To: #435.INP5									Conn. No.: 25
Tasks:											
T1000	DATA LOGGING TIMER 1000	0.5	TIMER								
Inputs: (None)											
Outputs: DOUT		To: #435.INP6									Conn. No.: 26
Tasks:											
T1200	DATA LOGGING TIMER 1200	0.5	TIMER								
Inputs: (None)											
Outputs: DOUT		To: #474.INP1									Conn. No.: 30
Tasks:											
T1400	DATA LOGGING TIMER 1400	0.5	TIMER								
Inputs: (None)											
Outputs: DOUT		To: #474.INP2									Conn. No.: 31
Tasks:											
T1600	DATA LOGGING TIMER 1600	0.5	TIMER								
Inputs: (None)											
Outputs: DOUT		To: #474.INP3									Conn. No.: 32
Tasks:											
T1800	DATA LOGGING TIMER 1800	0.5	TIMER								
Inputs: (None)											
Outputs: DOUT		To: #474.INP4									Conn. No.: 51
Tasks:											
T2000	DATA LOGGING TIMER 2000	0.5	TIMER								
Inputs: (None)											
Outputs: DOUT		To: #474.INP5									Conn. No.: 52
Tasks:											
T2200	DATA LOGGING TIMER 2200	0.5	TIMER								
Inputs: (None)											
Outputs: DOUT		To: #474.INP6									Conn. No.: 53
Tasks:											
TE-OR-BE		0.5	sor								
Inputs: INP1		From: PLCBEN.DOUT									Conn. No.: 71
Outputs: DOUT		To: FAST.INP1									Conn. No.: 111

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
QNOT			SLOWDOWN.CONT								112
Tasks:											
TIPNO101	MIX PUMP DIS. NOZ. 2 TEMP 1	1	ANALOG INPUT	DEG F	932	32			130	0	
Inputs: EVAL		From: G1C0.AO1						Conn. No.: 0			
Outputs: (None)											
Display/Item: PUMP / PROCESS POINT		Param: OUT		Type: PROCESS POINT				Pos: [94, 98]			
PUMP / SYMBOL :2		HALM		COLOR ACTION				[172, 97]			
PUMPALRM / SYMBOL :3		HALM		COLOR ACTION				[20,544]			
PUMPALRM / PROCESS POINT		HALV		PROCESS POINT				[628,544]			
PUMPALRM / PROCESS POINT		HALV		PROCESS POINT				[628,544]			
PUMPALRM / PROCESS POINT		HALM		COLOR ACTION				[628,544]			
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT				[808,544]			
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT				[808,544]			
PUMPALRM / PROCESS POINT		HALM		COLOR ACTION				[808,544]			
Tasks:											
TIPNO202	MIX PUMP DIS. NOZ. 1 TEMP 1	1	ANALOG INPUT	DEG F	932	32			130	0	
Inputs: EVAL		From: G1C0.AO8						Conn. No.: 7			
Outputs: (None)											
Display/Item: PUMP / PROCESS POINT		Param: OUT		Type: PROCESS POINT				Pos: [738,105]			
PUMP / SYMBOL :2		HALM		COLOR ACTION				[628,103]			
PUMPALRM / SYMBOL :3		HALM		COLOR ACTION				[20,587]			
PUMPALRM / PROCESS POINT		HALV		PROCESS POINT				[628,587]			
PUMPALRM / PROCESS POINT		HALV		PROCESS POINT				[628,587]			
PUMPALRM / PROCESS POINT		HALM		COLOR ACTION				[628,587]			
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT				[808,587]			
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT				[808,587]			
PUMPALRM / PROCESS POINT		HALM		COLOR ACTION				[808,587]			
Tasks:											
TIR12A01	PUMP MOTOR OIL TEMPERATURE A	1	ANALOG INPUT	DEG F	392	32			220	32.1	
Inputs: EVAL		From: G1C0.AO4						Conn. No.: 2			
Outputs: LALM		To: TZR12A01.INP1						Conn. No.: 104			
Display/Item: PUMP / PROCESS POINT		Param: OUT		Type: PROCESS POINT				Pos: [742,343]			
PUMP / SYMBOL :2		HALM		COLOR ACTION				[630,340]			
PUMPALRM / PROCESS POINT		HALV		PROCESS POINT				[628,671]			
PUMPALRM / PROCESS POINT		HALV		PROCESS POINT				[628,671]			
PUMPALRM / PROCESS POINT		HALM		COLOR ACTION				[628,671]			
PUMPALRM / SYMBOL :3		HALM		COLOR ACTION				[20,671]			

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	PUMPALRM / PROCESS POINT		OUT		PROCESS POINT				[808,671]		
	PUMPALRM / PROCESS POINT		OUT		PROCESS POINT				[808,671]		
	PUMPALRM / PROCESS POINT		HALM		COLOR ACTION				[808,671]		
Tasks:											
TIR12A02	PUMP MOTOR OIL TEMPERATURE B	1	ANALOG INPUT	DEG F	392	32			220	32.1	
Inputs: EVAL		From: G1C0.AO3						Conn. No.: 4			
Outputs: LALM		To: TZR12A02.INP1						Conn. No.: 105			
Display/Item: PUMP / PROCESS POINT		Param: OUT		Type: PROCESS POINT				Pos: [96,340]			
PUMP / SYMBOL :2		HALM		COLOR ACTION				[172,337]			
PUMPALRM / PROCESS POINT		HALV		PROCESS POINT				[628,629]			
PUMPALRM / PROCESS POINT		HALV		PROCESS POINT				[628,629]			
PUMPALRM / PROCESS POINT		HALM		COLOR ACTION				[628,629]			
PUMPALRM / SYMBOL :3		HALM		COLOR ACTION				[20,629]			
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT				[808,629]			
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT				[808,629]			
PUMPALRM / PROCESS POINT		HALM		COLOR ACTION				[808,629]			
Tasks:											
TTPNO101	DISCHARGE NOZZLE #2 TEMP TREN	1	ANALOG INPUT	DEG F	155	50			0	0	
Inputs: EVAL		From: G1C0.AO1						Conn. No.: 149			
Outputs: (None)											
Display/Item: PUMPOPS / TREND WINDOW		Param: OUT		Type: TREND WINDOW				Pos: [668,485]			
PUMPOPS / PROCESS POINT		HRNG		PROCESS POINT				[901,772]			
PUMPOPS / PROCESS POINT		LRNG		PROCESS POINT				[853,772]			
Tasks:											
TTPNO202	DISCHARGE NOZZLE #1 TEMP TREN	1	ANALOG INPUT	DEG F	155	50			0	0	
Inputs: EVAL		From: G1C0.AO8						Conn. No.: 150			
Outputs: (None)											
Display/Item: PUMPOPS / TREND WINDOW		Param: OUT		Type: TREND WINDOW				Pos: [668,485]			
Tasks:											
TTR12A01	PUMP MOTOR OIL TEMP A TREND	1	ANALOG INPUT	DEG F	240	50			0	0	
Inputs: EVAL		From: G1C0.AO4						Conn. No.: 148			
Outputs: (None)											
Display/Item: PUMPOPS / TREND WINDOW		Param: OUT		Type: TREND WINDOW				Pos: [33, 56]			
PUMPOPS / PROCESS POINT		HRNG		PROCESS POINT				[232,342]			
PUMPOPS / PROCESS POINT		LRNG		PROCESS POINT				[184,342]			
Tasks:											
TTR12A02	PUMP MOTOR OIL TEMP B TREND	1	ANALOG INPUT	DEG F	240	50			0	0	

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Inputs: EVAL		From: G1C0.AO3		Conn. No.: 147							
Outputs: (None)											
Display/Item: PUMPOPS / TREND WINDOW		Param: OUT		Type: TREND WINDOW		Pos: [33; 56]					
Tasks:											
TZPNO101	INSTRUMENT PROBLEM - TIPNO101	6	OR								Y
Inputs: INP1		From: G8C0.DO4		Conn. No.: 130							
Outputs: (None)											
Tasks:											
TZPNO202	INSTRUMENT PROBLEM - TIPNO202	6	OR								Y
Inputs: INP1		From: G8C0.DO3		Conn. No.: 129							
Outputs: (None)											
Tasks:											
TZR12A01	INSTRUMENT PROBLEM - TIR12A01	6	OR								Y
Inputs: INP1		From: TIR12A01.LALM		Conn. No.: 104							
INP2		G8C0.DO6		131							
Outputs: (None)											
Tasks:											
TZR12A02	INSTRUMENT PROBLEM - TIR12A02	6	OR								Y
Inputs: INP1		From: TIR12A02.LALM		Conn. No.: 105							
INP2		G8C0.DO8		133							
Outputs: (None)											
Tasks:											
V1.01		30	d FLIP FLOP								
Inputs: (None)											
Outputs: DOUT		To: V1.01.INP1		Conn. No.: 56							
Display/Item: MENU / PROCESS POINT		Param: TAG		Type: PROCESS POINT		Pos: [640,920]					
Tasks:											
VERSION	V1.01	30	AND								N
Inputs: (None)											
Outputs: DOUT		To: VERSION.INP1		Conn. No.: 139							
Display/Item: IOSTATUS / PROCESS POINT		Param: DESC		Type: PROCESS POINT		Pos: [656,921]					
PUMP / PROCESS POINT		DESC		PROCESS POINT		[650,920]					
PUMPALRM / PROCESS POINT		DESC		PROCESS POINT		[657,926]					
PUMPOPS / PROCESS POINT		DESC		PROCESS POINT		[656,918]					
Tasks:											
VR232020	MIXER PUMP MOTOR VOLTAGE	1	ANALOG INPUT	VAC	460	0		0	0		
Inputs: EVAL		From: H2C12.AO6		Conn. No.: 103							

Genesis Strategy Data Dictionary

MAST TEST, Version 1.01

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Outputs: (None)											
Display/Item: PUMP / PROCESS POINT		Param: OUT		Type: PROCESS POINT			Pos: [110,560]				
Tasks:											
VR232040	PUMP MOTOR CURRENT	1	ANALOG INPUT	AMPS	225	0			0	0	
Inputs: EVAL		From: H2C12.AO5						Conn. No.: 77			
Outputs: (None)											
Display/Item: PUMP / PROCESS POINT		Param: OUT		Type: PROCESS POINT			Pos: [110,600]				
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT			[808,755]				
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT			[808,755]				
PUMPOPS / TREND WINDOW		OUT		TREND WINDOW			[668, 56]				
Tasks:											
VR232050	PUMP SPEED	1	ANALOG INPUT	RPM	1200	0			0	0	
Inputs: EVAL		From: H2C12.AO1						Conn. No.: 54			
Outputs: (None)											
Display/Item: PUMP / PROCESS POINT		Param: OUT		Type: PROCESS POINT			Pos: [110,640]				
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT			[808,798]				
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT			[808,798]				
PUMPOPS / TREND WINDOW		OUT		TREND WINDOW			[351, 56]				
Tasks:											
VR232080	ROTATIONAL MOTOR VOLTAGE	1	ANALOG INPUT	VOLTS	460	0			0	0	
Inputs: EVAL		From: H2C12.AO2						Conn. No.: 55			
Outputs: (None)											
Display/Item: PUMP / PROCESS POINT		Param: OUT		Type: PROCESS POINT			Pos: [845,679]				
Tasks:											
VR232100	ROTATIONAL MOTOR CURRENT	1	ANALOG INPUT	AMPS	20	0			0	0	
Inputs: EVAL		From: H2C12.AO3						Conn. No.: 75			
Outputs: (None)											
Display/Item: PUMP / PROCESS POINT		Param: OUT		Type: PROCESS POINT			Pos: [845,710]				
Tasks:											
VR232110	ROTATIONAL MOTOR SPEED	1	ANALOG INPUT	RPM	1200	0			0	0	
Inputs: EVAL		From: H2C12.AO4						Conn. No.: 76			
Outputs: (None)											
Display/Item: PUMP / PROCESS POINT		Param: OUT		Type: PROCESS POINT			Pos: [845,741]				
Tasks:											
WDTNOT		1	not								
Inputs: (None)											
Outputs: DOUT		To: WDTNOT.INP1						Conn. No.: 45			

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Tasks:											
WDTRESET	WATCH DOG TIMER FROM GENESIS	1	DIGITAL OUTPUT								
Inputs: INP		From: WDTNOT.DOUT						Conn. No.:		46	
Outputs: DOUT		To: DEV 2.MODBS+ GROUP 1 #0						Conn. No.:		47	
Tasks:											
WIR12A01	PUMP SUPPORT COLUMN STRAIN #	1	ANALOG INPUT	uIN/IN	684	-684			145.5	-145.5	
Inputs: EVAL		From: G1C9.AO1						Conn. No.:		15	
Outputs: HALM		To: HPCSALM.INP1						Conn. No.:		59	
LALM		LPCSALM.INP1								63	
Display/Item:	PUMP / PROCESS POINT	Param:	OUT	Type:	PROCESS POINT			Pos:	[740,460]		
	PUMP / SYMBOL :2		HALM		COLOR ACTION				[630,460]		
	PUMP / SYMBOL :2		LALM		COLOR ACTION				[630,460]		
	PUMPALRM / SYMBOL :3		HALM		COLOR ACTION				[20,249]		
	PUMPALRM / SYMBOL :3		LALM		COLOR ACTION				[20,249]		
	PUMPALRM / PROCESS POINT		LALV		PROCESS POINT				[538,249]		
	PUMPALRM / PROCESS POINT		LALV		PROCESS POINT				[538,249]		
	PUMPALRM / PROCESS POINT		LALM		COLOR ACTION				[538,249]		
	PUMPALRM / PROCESS POINT		HALV		PROCESS POINT				[628,249]		
	PUMPALRM / PROCESS POINT		HALV		PROCESS POINT				[628,249]		
	PUMPALRM / PROCESS POINT		HALM		COLOR ACTION				[628,249]		
	PUMPALRM / PROCESS POINT		OUT		PROCESS POINT				[808,249]		
	PUMPALRM / PROCESS POINT		OUT		PROCESS POINT				[808,249]		
	PUMPALRM / PROCESS POINT		HALM		COLOR ACTION				[808,249]		
	PUMPALRM / PROCESS POINT		LALM		COLOR ACTION				[808,249]		
Tasks:											
WIR12A02	PUMP SUPPORT COLUMN STRAIN #	1	ANALOG INPUT	uIN/IN	684	-684			145.5	-145.5	
Inputs: EVAL		From: G1C9.AO8						Conn. No.:		18	
Outputs: HALM		To: HPCSALM.INP2						Conn. No.:		60	
LALM		LPCSALM.INP2								64	
Display/Item:	PUMP / PROCESS POINT	Param:	OUT	Type:	PROCESS POINT			Pos:	[100,460]		
	PUMP / SYMBOL :2		HALM		COLOR ACTION				[180,460]		
	PUMP / SYMBOL :2		LALM		COLOR ACTION				[180,460]		
	PUMPALRM / SYMBOL :3		HALM		COLOR ACTION				[20,207]		
	PUMPALRM / SYMBOL :3		LALM		COLOR ACTION				[20,207]		
	PUMPALRM / PROCESS POINT		LALV		PROCESS POINT				[538,207]		
	PUMPALRM / PROCESS POINT		LALV		PROCESS POINT				[538,207]		
	PUMPALRM / PROCESS POINT		LALM		COLOR ACTION				[538,207]		

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	PUMPALRM / PROCESS POINT		HALV		PROCESS POINT				[628,207]		
	PUMPALRM / PROCESS POINT		HALV		PROCESS POINT				[628,207]		
	PUMPALRM / PROCESS POINT		HALM		COLOR ACTION				[628,207]		
	PUMPALRM / PROCESS POINT		OUT		PROCESS POINT				[808,207]		
	PUMPALRM / PROCESS POINT		OUT		PROCESS POINT				[808,207]		
	PUMPALRM / PROCESS POINT		HALM		COLOR ACTION				[808,207]		
	PUMPALRM / PROCESS POINT		LALM		COLOR ACTION				[808,207]		
Tasks:											
WIR12A03	PUMP SUPPORT COLUMN STRAIN #	1	ANALOG INPUT	uIN/IN	684	-684			145.5	-145.5	
	Inputs: EVAL		From: G1C9.AO2						Conn. No.:	16	
	Outputs: HALM		To: HPCSALM.INP3						Conn. No.:	61	
	LALM		LPCSALM.INP3							65	
Display/Item:	PUMP / PROCESS POINT		Param: OUT		Type: PROCESS POINT				Pos: [740,420]		
	PUMP / SYMBOL :2		HALM		COLOR ACTION				[630,420]		
	PUMP / SYMBOL :2		LALM		COLOR ACTION				[630,420]		
	PUMPALRM / SYMBOL :3		HALM		COLOR ACTION				[20,165]		
	PUMPALRM / SYMBOL :3		LALM		COLOR ACTION				[20,165]		
	PUMPALRM / PROCESS POINT		LALV		PROCESS POINT				[538,165]		
	PUMPALRM / PROCESS POINT		LALV		PROCESS POINT				[538,165]		
	PUMPALRM / PROCESS POINT		LALM		COLOR ACTION				[538,165]		
	PUMPALRM / PROCESS POINT		HALV		PROCESS POINT				[628,165]		
	PUMPALRM / PROCESS POINT		HALV		PROCESS POINT				[628,165]		
	PUMPALRM / PROCESS POINT		HALM		COLOR ACTION				[628,165]		
	PUMPALRM / PROCESS POINT		OUT		PROCESS POINT				[808,165]		
	PUMPALRM / PROCESS POINT		OUT		PROCESS POINT				[808,165]		
	PUMPALRM / PROCESS POINT		HALM		COLOR ACTION				[808,165]		
	PUMPALRM / PROCESS POINT		LALM		COLOR ACTION				[808,165]		
Tasks:											
WIR12A04	PUMP SUPPORT COLUMN STRAIN #	1	ANALOG INPUT	uIN/IN	684	-684			145.5	-145.5	
	Inputs: EVAL		From: G1C8.AO7						Conn. No.:	14	
	Outputs: HALM		To: HPCSALM.INP4						Conn. No.:	62	
	LALM		LPCSALM.INP4							69	
Display/Item:	PUMP / PROCESS POINT		Param: OUT		Type: PROCESS POINT				Pos: [100,420]		
	PUMP / SYMBOL :2		HALM		COLOR ACTION				[180,420]		
	PUMP / SYMBOL :2		LALM		COLOR ACTION				[180,420]		
	PUMPALRM / SYMBOL :3		HALM		COLOR ACTION				[20,123]		
	PUMPALRM / SYMBOL :3		LALM		COLOR ACTION				[20,123]		

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	PUMPALRM / PROCESS POINT		LALV		PROCESS POINT				[538,123]		
	PUMPALRM / PROCESS POINT		LALV		PROCESS POINT				[538,123]		
	PUMPALRM / PROCESS POINT		LALM		COLOR ACTION				[538,123]		
	PUMPALRM / PROCESS POINT		HALV		PROCESS POINT				[628,123]		
	PUMPALRM / PROCESS POINT		HALV		PROCESS POINT				[628,123]		
	PUMPALRM / PROCESS POINT		HALM		COLOR ACTION				[628,123]		
	PUMPALRM / PROCESS POINT		OUT		PROCESS POINT				[808,123]		
	PUMPALRM / PROCESS POINT		OUT		PROCESS POINT				[808,123]		
	PUMPALRM / PROCESS POINT		HALM		COLOR ACTION				[808,123]		
	PUMPALRM / PROCESS POINT		LALM		COLOR ACTION				[808,123]		
Tasks:											
WZR12A01	INSTRUMENT PROBLEM - WIR12A01	6	OR								Y
Inputs: INP1		From: G8C0.DO14				Conn. No.: 135					
Outputs: (None)											
Tasks:											
WZR12A02	INSTRUMENT PROBLEM - WIR12A02	6	OR								Y
Inputs: INP1		From: G8C0.DO10				Conn. No.: 134					
Outputs: (None)											
Tasks:											
WZR12A03	INSTRUMENT PROBLEM - WIR12A03	6	OR								Y
Inputs: INP1		From: G8C0.DO15				Conn. No.: 136					
Outputs: (None)											
Tasks:											
WZR12A04	INSTRUMENT PROBLEM - WIR12A04	6	OR								Y
Inputs: INP1		From: G8C1.DO1				Conn. No.: 137					
Outputs: (None)											
Tasks:											
XFERPULS	TIME TO TRANSFER	6	ONE SHOT								
Inputs: CONT		From: GO.DOUT				Conn. No.: 33					
Outputs: DOUT		To: D1SEC.CONT				Conn. No.: 74					
DOUT		D2SEC.CONT				161					
DOUT		PUMP.STOP				90					
Tasks:											
XIR12AN1	PUMP CASING VIBRATION	1	ANALOG INPUT	G'S	80	0			0	0	
Inputs: EVAL		From: G1C8.AO6				Conn. No.: 13					
Outputs: (None)											
Display/Item: PUMP / PROCESS POINT		Param: OUT			Type: PROCESS POINT			Pos: [740,500]			

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Tasks:											
ZIMPE112	MOTOR POSITION ENCODER BCD	1	ANALOG INPUT	DEG	190	0			0	0	
Inputs: EVAL		From: H2C0.AO3				Conn. No.: 44					
Outputs: (None)											
Display/Item: PUMP / PROCESS POINT		Param: OUT		Type: PROCESS POINT				Pos: [872,807]			
Tasks:											
ZIMPE142	PUMP COLUMN N2 PRESSURE	1	ANALOG INPUT	PSIG	15	0			8	4	
Inputs: EVAL		From: G1C0.AO6				Conn. No.: 5					
Outputs: HALM		To: ZZMPE142.INP1				Conn. No.: 106					
Display/Item: PUMP / PROCESS POINT		Param: OUT		Type: PROCESS POINT				Pos: [740,560]			
PUMP / SYMBOL :2		HALM		COLOR ACTION				[630,559]			
PUMP / SYMBOL :2		LALM		COLOR ACTION				[630,559]			
PUMPALRM / PROCESS POINT		LALV		PROCESS POINT				[538,376]			
PUMPALRM / PROCESS POINT		LALV		PROCESS POINT				[538,376]			
PUMPALRM / PROCESS POINT		LALM		COLOR ACTION				[538,376]			
PUMPALRM / PROCESS POINT		HALV		PROCESS POINT				[628,376]			
PUMPALRM / PROCESS POINT		HALV		PROCESS POINT				[628,376]			
PUMPALRM / PROCESS POINT		HALM		COLOR ACTION				[628,376]			
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT				[808,376]			
PUMPALRM / PROCESS POINT		OUT		PROCESS POINT				[808,376]			
PUMPALRM / PROCESS POINT		HALM		COLOR ACTION				[808,376]			
PUMPALRM / PROCESS POINT		LALM		COLOR ACTION				[808,376]			
PUMPALRM / SYMBOL :3		HALM		COLOR ACTION				[20,376]			
PUMPALRM / SYMBOL :3		LALM		COLOR ACTION				[20,376]			
Tasks:											
ZIMPE143	MIX PUMP POS. LIMIT SWITCH CW	1	DIGITAL INPUT								Y
Inputs: EVAL		From: G2C0.DO16				Conn. No.: 49					
Outputs: DOUT		To: MOLIMERR.INP1				Conn. No.: 1					
Display/Item: PUMP / CIRCLE RAD=9		Param: DOUT		Type: COLOR ACTION				Pos: [182,781]			
PUMPALRM / SYMBOL :5		DOUT		COLOR ACTION				[20,333]			
PUMPALRM / PROCESS POINT		DOUT		PROCESS POINT				[841,333]			
PUMPALRM / PROCESS POINT		DOUT		PROCESS POINT				[841,333]			
PUMPALRM / PROCESS POINT		DOUT		COLOR ACTION				[841,333]			
Tasks:											
ZIMPE144	MIX PUMP POS. LIMIT SWITCH CCW	1	DIGITAL INPUT								Y
Inputs: EVAL		From: G2C0.DO15				Conn. No.: 48					
Outputs: DOUT		To: MOLIMERR.INP2				Conn. No.: 3					

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Display/Item:	PUMP / CIRCLE RAD=9	Param:	DOUT	Type:	COLOR ACTION	Pos:	[182,820]				
	PUMPALRM / PROCESS POINT		DOUT		PROCESS POINT		[841,291]				
	PUMPALRM / PROCESS POINT		DOUT		PROCESS POINT		[841,291]				
	PUMPALRM / PROCESS POINT		DOUT		COLOR ACTION		[841,291]				
	PUMPALRM / SYMBOL :5		DOUT		COLOR ACTION		[20,291]				
Tasks:											
ZZMPE142	INSTRUMENT PROBLEM - ZIMPE142	6	OR								Y
Inputs:	INP1	From:	ZIMPE142.HALM						Conn. No.:	106	
	INP2		G8C1.DO8							138	
Outputs: (None)											

	IOSTATUS	PUMP	PUMPALRM	PUMPOPS	MENU											
Sorted by Tagname	SETLIMS	HISTFNAM														
TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
#435																436
Inputs:																
Outputs:																
Tasks:																
#474																473
Inputs:																
Outputs:																
Tasks:																
A5ABORT	N	1	E		Y	N	N									32
Inputs:																
Outputs:																
Tasks:																
ABRTCOIL	N	1	E		Y	N	N									100
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
COMABRT			N		N	N										372
Inputs:																

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TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Tasks:																
DEV 2																
Inputs:																
Outputs:																
Tasks:																
DOWNLIMS																383
Inputs:																
Outputs:																
R&R File:																
Tasks:																
FAST																143
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
FILENAME																474
Inputs:																
Outputs:																
R&R File:																
Tasks:																
G1C0	N	0	0		N	N	N					0	0			126
Inputs:																
Outputs:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Tasks:																
G1C2	N	0	0		N	N	N					0	0			128
Inputs:																
Outputs:																
Tasks:																
G1C8	N	0	0		N	N	N					0	0			134
Inputs:																
Outputs:																
Tasks:																
G1C9	N	0	0		N	N	N					0	0			135
Inputs:																
Outputs:																
Tasks:																
G2C0	NNNNNNNN NNNNNNNN	0		NNNNNNNN NNNNNNNN	N	N	N									13
Inputs:																
Outputs:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Tasks:																
G2C1	NNNNNNNN NNNNNNNN	0		NNNNNNNN NNNNNNNN	N	N	N									216
Inputs:																
Outputs:																
Tasks:																
G2C2	NNNNNNNN NNNNNNNN	0		NNNNNNNN NNNNNNNN	N	N	N									14
Inputs:																
Outputs:																
Tasks:																
G2C3	NNNNNNNN NNNNNNNN	0		NNNNNNNN NNNNNNNN	N	N	N									33
Inputs:																
Outputs:																
Tasks:																
G4C0						N								0	0	557
Inputs:																
Outputs:																
Tasks:																
G4C3						N								0	0	16
Inputs:																
Outputs:																
Tasks:																
G4C4						N								0	0	61
Inputs:																
Outputs:																

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TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Tasks:																
G5C2	YYYYYYYY YYYYYY	0		NNNNNNNN NNNNNNNN	N	N	N	N		ABORT	OK					389
Inputs:																
Outputs:																
Tasks:																
G6C2	YYYYYYYY YYYYYY	0		NNNNNNNN NNNNNNNN	N	N	N	N								60
Inputs:																
Outputs:																
Tasks:																
G6C3	YYYYYYYY YYYYYY	0		NNNNNNNN NNNNNNNN	N	N	N	N								65
Inputs:																
Outputs:																
Tasks:																
G7C1	YYYYYYNY YYYYYY	0		NNNNNNNN NNNNNNNN	N	N	N	N								4
Inputs:																
Outputs:																
Tasks:																
G7C2	YYNYYYYY YNNYYYY	1		NNNNNNNN NNNNNNNN	N	N	N	N		ABORT	OK					168
Inputs:																
Outputs:																
Display/Item:																

[illegible]

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Outputs:																
Tasks:																
H2C11	N	0	0		N	N	N					0	0			37
Inputs:																
Outputs:																
Tasks:																
H2C12	N	0	0		N	N	N					0	0			125
Inputs:																
Outputs:																
Tasks:																
H3C0	YYYYYYYY YNYYYYY	1		NNNNNNNN NNNNNNNN	N	N	N		IOSTATUS	OK	BAD					531
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
H3C1	YYYYYYYY YYYNNN	1		NNNNNNNN NNNNNNNN	N	N	N		IOSTATUS	OK	BAD					532
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
H3C2	YYYYYYYY YNYYYYY	1		NNNNNNNN NNNNNNNN	N	N	N		IOSTATUS	OK	BAD					21

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
HILIM	N	0	0		Y	N	N					0	0			560
Inputs:																
Outputs:																
R&R File:																
Tasks:																
HPCSABRT																97
Inputs:																
Outputs:																
Tasks:																
HPCSALM																220
Inputs:																
Outputs:																
Tasks:																
HPCSLIM	N	0	-684		Y	N	N					0	0			10
Inputs:																
Outputs:																
Display/Item:																
R&R File:																
Tasks:																
HPMOTLIM	N	0	32		Y	N	N					0	0			7

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TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Tasks:																
PCSABRT																460
Inputs:																
Outputs:																
Tasks:																
PIR12A01	N	0	E		Y	N	N		PUMP			0	0			50
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
PITNO110	N	0	E		Y	N	N		PUMP			0	0			66
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
PITNO111	N	0	E		Y	N	N		PUMP			0	0			59
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
PLCBEN	N	0		E	Y	N	N									392
Inputs:																
Outputs:																
Tasks:																
PLCCOMFA	N	0		E	Y	N	N									82
Inputs:																
Outputs:																
Tasks:																
PLCFAIL	N	1		E	Y	N	N			FAILURE	OK					24
Inputs:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Outputs:																
Tasks:																
PLCFAIL2	N	0								FAILURE	OK					196
Inputs:																
Outputs:																
Tasks:																
PLCOK	N	1		E	Y	N	N									247
Inputs:																
Outputs:																
Tasks:																
PLCPDPAB	N	0	E		Y	N	N					0	0			295
Inputs:																
Outputs:																
Tasks:																
PLCPDPAL	N	0	E		Y	N	N					0	0			144
Inputs:																
Outputs:																
Tasks:																
PLCPMCAB	N	0	E		Y	N	N					0	0			300
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
PLCPMCAL	N	0	E		N	N	N					0	0			141
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
PLCPSLIM	N	0	E		Y	N	N					0	0			266
Inputs:																
Outputs:																
Display/Item:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Tasks:																
PLCSPDAL	N	0	E		Y	N	N					0	0			153
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
PLCWD	N	0								ON						197
Inputs:																
Outputs:																
Tasks:																
PLCWDOFF																195
Inputs:																
Outputs:																
Tasks:																
PLCWDON																194
Inputs:																
Outputs:																
Tasks:																
PMCALARM	N	1		E	Y	N	N									34
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
PMPINRUN	N	0		E	Y	N	N									119
Inputs:																
Outputs:																
Tasks:																
PN2PO506	N	1	E		Y	N	N		PUMP			0	0			6
Inputs:																
Outputs:																
Display/Item:																

[illegible]

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Tasks:																
PULCOIL																103
Inputs:																
Outputs:																
Tasks:																
PULON																478
Inputs:																
Outputs:																
R&R File:																
Tasks:																
PUMP																433
Inputs:																
Outputs:																
R&R File:																
Tasks:																
PYR12A01	N	0														35
Inputs:																
Outputs:																
Tasks:																
PZR12A01	N	0														567
Inputs:																
Outputs:																
Tasks:																
RSTCOIL				E		Y	N									101
Inputs:																
Outputs:																
Tasks:																
SLOWDOWN																166
Inputs:																
Outputs:																
Tasks:																

TAGNAME	INH. ALARM	PRI. VAL	ENT. VAL	ENT. BIT	TRK	MAN	SCN	FUL	OUT	FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI	INST. LOW	RAW	LOW	BLK. ID
SPARE1	N	0	E		Y	N	N							0	0			2
Inputs:																		
Outputs:																		
Tasks:																		
SPARE2	N	0	E		Y	N	N							0	0			1
Inputs:																		
Outputs:																		
Tasks:																		
ST5COMFA	N	1	E		Y	N	N											147
Inputs:																		
Outputs:																		
Tasks:																		
ST8COMFA	N	1	E		Y	N	N											31
Inputs:																		
Outputs:																		
Tasks:																		
STRAIN																		19
Inputs:																		
Outputs:																		
R&R File:																		
Tasks:																		
T0000																		434
Inputs:																		
Outputs:																		
Tasks:																		
T0200																		432
Inputs:																		
Outputs:																		
Tasks:																		
T0400																		435
Inputs:																		
Outputs:																		
Tasks:																		
T0600																		437
Inputs:																		

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Outputs:																
Tasks:																
T0800																447
Inputs:																
Outputs:																
Tasks:																
T1000																455
Inputs:																
Outputs:																
Tasks:																
T1200																421
Inputs:																
Outputs:																
Tasks:																
T1400																22
Inputs:																
Outputs:																
Tasks:																
T1600																431
Inputs:																
Outputs:																
Tasks:																
T1800																469
Inputs:																
Outputs:																
Tasks:																
T2000																470
Inputs:																
Outputs:																
Tasks:																
T2200																472
Inputs:																
Outputs:																
Tasks:																
TE-OR-BE																142
Inputs:																
Outputs:																

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TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Tasks:																
TIR12A02	N	1	E		Y	N	N		PUMP			0	0			117
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
TTPNO101	N	0	E		Y	N	N		PUMP			0	0			11
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
TTPNO202	N	0	E		Y	N	N		PUMP			0	0			15
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
TTR12A01	N	0	E		Y	N	N		PUMP			0	0			8
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
TTR12A02	N	0	E		Y	N	N		PUMP			0	0			9

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
TZPNO101	N	1														249
Inputs:																
Outputs:																
Tasks:																
TZPNO202	N	1														248
Inputs:																
Outputs:																
Tasks:																
TZR12A01	N	1														563
Inputs:																
Outputs:																
Tasks:																
TZR12A02	N	1														565
Inputs:																
Outputs:																
Tasks:																
V1.01																0
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
VERSION	Y	0														71
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
VR232020	N	0	E		Y	N	N					0	0			492
Inputs:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Outputs:																
Display/Item:																
Tasks:																
VR232040	N	0	E		Y	N	N					0	0			26
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
VR232050	N	0	E		Y	N	N					0	0			28
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
VR232080	N	0	E		Y	N	N					0	0			376
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
VR232100	N	0	E		Y	N	N					0	0			403
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
VR232110	N	0	E		Y	N	N					0	0			404
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
WDTNOT																111
Inputs:																
Outputs:																

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TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Tasks:																
WZR12A01	N	1														212
Inputs:																
Outputs:																
Tasks:																
WZR12A02	N	1														252
Inputs:																
Outputs:																
Tasks:																
WZR12A03	N	1														230
Inputs:																
Outputs:																
Tasks:																
WZR12A04	N	1														172
Inputs:																
Outputs:																
Tasks:																
XFERPULS																161
Inputs:																
Outputs:																
Tasks:																
XIR12AN1	N	0	E		Y	N	N		PUMP			0	0			49
Inputs:																
Outputs:																
Display/Item:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Tasks:																
ZIMPE112	N	0	E		Y	N	N		PUMP			0	0			55
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
ZIMPE142	N	1	E		Y	N	N		PUMP			0	0			74
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
ZIMPE143	N	1	E		Y	N	N		PUMP	LIMIT	OK					-73
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
ZIMPE144	N	1	E		Y	N	N		PUMP	LIMIT	OK					57
Inputs:																
Outputs:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Display/Item:																
Tasks:																
ZZMPE142	N	1														566
Inputs:																
Outputs:																

Appendix L: MASFPUMP GENESIS DATA DICTIONARY

Genesis Strategy Data Dictionary

 Display Connections
Added for:

 Sorted by
Tagname

Strategy: MASFPUMP Version: 1.01

 Report & Recipe
References Added for
.RPS files named:

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
A5ABRT	AF5000 COMM ABORT	0.5	DIGITAL OUTPUT								
Inputs: INP		From: COMMOR.DOUT						Conn. No.: 139			
Outputs: DOUT		To: DEV 4.MODBS+ GROUP 3 #10						Conn. No.: 211			
Tasks:											
ABORT	PLC ABORT COIL SET	0.5	DIGITAL INPUT								Y
Inputs: EVAL		From: J2C2.DO10						Conn. No.: 149			
Outputs: DOUT		To: ABORTOR.INP1						Conn. No.: 68			
Display/Item: DMPROB / TEXT="PLC ABORT.." DO		Param: DOUT		Type: SELECTION LIST			Pos: [80,460]				
POSPROB / TEXT="PLC ABORT.." DOT		DOUT		SELECTION LIST			[80,460]				
PSPROB / TEXT="PLC ABORT.." DOT		DOUT		SELECTION LIST			[80,420]				
Tasks:											
ABORTOR	ABORT CONDITION ACTIVE	0.1	OR								Y
Inputs: INP1		From: ABORT.DOUT						Conn. No.: 68			
INP2		COMMOR.DOUT						150			
INP3		NODEFAIL.DOUT						213			
INP4		PLCFAIL.DOUT						248			
Outputs: DOUT		To: ABORTPUL.CONT						Conn. No.: 78			
QNOT		NODMPROB.INP2						407			
QNOT		NOPOPROB.INP5						299			
QNOT		NOPSPROB.INP3						281			
QNOT		PBPOSAND.INP6						295			
QNOT		PBSTRAN2.INP2						322			
QNOT		STARTAND.INP2						214			
Tasks:											
ABORTPUL	STOP PUMP AND DIR MOTOR	0.1	ONE SHOT								
Inputs: CONT		From: ABORTOR.DOUT						Conn. No.: 78			
Outputs: DOUT		To: STOPTEST.INP3						Conn. No.: 93			
Tasks:											
ACCELCHG		0.25	ALARM						1e+09	-1e+10	

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Inputs: MEAS		From: UACCEL.OUT							Conn. No.: 4e+02		
SP		OACCEL.OUT							4e+02		
Outputs: DALM		To: CHGCHK1.INP2							Conn. No.: 4e+02		
Tasks:											
AF5COMFA	AF5000 COMMUNICATIONS FAILURE	0.5	DIGITAL INPUT								Y
Inputs: EVAL		From: COMMOR.DOUT							Conn. No.: 65		
Outputs: (None)											
Tasks:											
ANGLECHG		0.25	ALARM						1e+09	-1e+10	
Inputs: MEAS		From: UANGLE.OUT							Conn. No.: 4e+02		
SP		OANGLE.OUT							4e+02		
Outputs: DALM		To: CHANGED.INP3							Conn. No.: 4e+02		
Tasks:											
ANTON		2	TON								
Inputs: CONT		From: ON.DOUT							Conn. No.: 70		
Outputs: DO2		To: POSITION.IALM							Conn. No.: 181		
DOUT		SWCABRT.SWCH							462		
DOUT		SWCALRM.SWCH							461		
DOUT		SWCSPDAB.SWCH							456		
DOUT		SWCSPDAL.SWCH							457		
Tasks:											
BACKWARD		0.1	sand								
Inputs: INP1		From: NOTRUN.DOUT							Conn. No.: 3		
INP2		DISMOVE.QNOT							9		
Outputs: QNOT		To: GOREVERS,RSET							Conn. No.: 36		
Tasks:											
BENAB		0.5	rs FLIP FLOP								
Inputs: INP1		From: ENABBUMP.DOUT							Conn. No.: 71		
INP2		RESETBEN.DOUT							73		
Outputs: DOUT		To: BUMPENAB.EVAL							Conn. No.: 72		
DOUT		POSORBUM.INP2							452		
Tasks:											
BUMPENAB	INDICATES TRY TO ENABLE BUMP	0.1	DIGITAL INPUT								N
Inputs: EVAL		From: BENAB.DOUT							Conn. No.: 72		
Outputs: DOUT		To: CHKCLR1.INP2							Conn. No.: 331		
DOUT		DISP2.DIN2							333		
R&R File: PBSETVAL.RPS (line 36)		Line: @IF(BUMPENAB.OUT == 1) ; Is this a pump bump or a phase b test?									

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Tasks:											
BUTPULSE		2	pulse								
Inputs: (None)											
Outputs: DOUT		To: BUTPULSE.INP1						Conn. No.: 42			
Tasks:											
CALCURR		0.5	FX		225	0					
Inputs: INP		From: PMOTOR.SPDSET.inp						Conn. No.: 158			
Outputs: OUT		To: CURPRED.EVAL						Conn. No.: 160			
OUT2		CURALRM.EVAL						161			
OUT3		CURABRT.EVAL						162			
Display/Item: CURDPRLM / DATA ENTRY		Param: AR2		Type: DATA ENTRY		Pos: [400,577]					
CURDPRLM / DATA ENTRY		AR3		DATA ENTRY		[400,537]					
Tasks:											
CALDISPR		0.5	FX		100	0					
Inputs: INP		From: PMOTOR.SPDSET.inp						Conn. No.: 159			
Outputs: OUT		To: DISPRPRE.EVAL						Conn. No.: 163			
OUT2		DISPRALM.EVAL						164			
OUT3		DISPRABT.EVAL						165			
Tasks:											
CHANGED		0.25	sor								
Inputs: INP1		From: RESCHG.DOUT						Conn. No.: 388			
INP2		CHGCHK1.DOUT						389			
INP3		ANGLECHG.DALM						395			
Outputs: (None)											
R&R File: PBSETVAL.RPS (line 81)		Line: @if(((INFILE.OUT == 0) or (CHANGED.OUT == 1)) ;check for test in file or changed.									
Tasks:											
CHGCHK1		0.25	sor								
Inputs: INP1		From: SECSCHG.DALM						Conn. No.: 385			
INP2		ACCELCHG.DALM						386			
INP3		DECELCHG.DALM						387			
INP4		MINSCHG.DALM						392			
INP5		HRSCHG.DALM						393			
INP6		SPEEDCHG.DALM						394			
Outputs: DOUT		To: CHANGED.INP2						Conn. No.: 389			
Tasks:											
CHKANDPO		0.1	sand								
Inputs: INP1		From: CHKCOLOR.DOUT						Conn. No.: 454			

TAGNAME	DESCRIPTION	SCAN	TIME	BLOCK TYPE	UNITS	HIGH RANGE	E RANGE	LIM. HIGH	LIM. LOW	ALM HIGH	ALM LOW	DIG ALARM
	INP2			POSORBUM.DOUT								455
	Outputs: DOUT			To: RESETBEN.INP1								Conn. No.: 74
	Tasks:											
CHGCLR1	Inputs: INP1		0.1	sand								
	Outputs: DOUT			From: VALSET.DOUT								Conn. No.: 76
	INP2			BUMPENAB.DOUT								331
	Outputs: DOUT			To: DISF2.DIN1								Conn. No.: 332
	Tasks:											
CHGCLR1N	Inputs: CONT		0.1	TON								
	Outputs: DOUT			From: CHKCOLOR.DOUT								Conn. No.: 448
	Outputs: DOUT			To: PENABA.INP1								Conn. No.: 254
	Tasks:											
CHKCOLOR	Inputs: (None)		2	pulse								
	Outputs: DOUT			To: CHKANDPO.INP1								Conn. No.: 454
	DOUT			CHKCLR1N.CONT								448
	DOUT			CHKCOLOR.INP1								116
	Tasks:											
CLRMESS	Inputs: (None)		0.5	pulse								
	Outputs: DOUT			To: CLRMESS.INP1								Conn. No.: 298
	R&R File: DELETE.RPS (line 50)			Line: @set(c1rmess,out,1)								
	SAVE.RPS (line 70)			@set(c1rmess,out,1)								
	Tasks:											
COMMON	Inputs: INP1		0.5	sor								
	From: DMOTOR.ACCEL.fail											Conn. No.: 69
	INP2			PMOTOR.ACCEL.fail								192
	Outputs: DOUT			To: A5ABRT.INP								Conn. No.: 139
	DOUT			ABORTOR.INP2								150
	DOUT			AF5COMFA.EVAL								65
	QNOT			PMOTOR.forward.doo								55
	Display/Item: DMPROB / TEXT="AF5000+ C.." DOT			Param: DOUT								
	POSPROB / TEXT="AF5000+ C.." DOT			DOUT								[80,420]
	PSPROB / TEXT="AF5000+ C.." DOT			DOUT								[80,380]
	Tasks:											
CURABRT	ABORT FOR PUMP CURRENT DRAW		0.5	ANALOG INPUT	AMPS	225	0				0	
	Inputs: EVAL			From: CALCURR.OUT3								Conn. No.: 162

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Outputs: OUT	To: SWCABRT.INP2										Conn. No.: 463
Display/Item: CURDPRLM / PROCESS POINT	Param: OUT				Type: PROCESS POINT						Pos: [280,537]
Tasks:											
CURALRM	ALARM FOR PUMP CURRENT DRAW	0.5	ANALOG INPUT	AMPS	225	0			0	0	
Inputs: EVAL	From: CALCURR.OUT2										Conn. No.: 161
Outputs: OUT	To: SWCALRM.INP2										Conn. No.: 173
OUT	VR232040.HALM										166
Display/Item: CURDPRLM / PROCESS POINT	Param: OUT				Type: PROCESS POINT						Pos: [280,577]
Tasks:											
CURPRED	PREDICTED PUMP CURRENT DRAW	0.5	ANALOG INPUT	AMPS	225	0			0	0	
Inputs: EVAL	From: CALCURR.OUT										Conn. No.: 160
Outputs: (None)											
Display/Item: CURDPRLM / PROCESS POINT	Param: OUT				Type: PROCESS POINT						Pos: [340,617]
CURDPRLM / PROCESS POINT	OUT				PROCESS POINT						[480,577]
CURDPRLM / PROCESS POINT	OUT				PROCESS POINT						[480,537]
Tasks:											
DACCEL	DIR MOTOR ACCEL RATE	0.5	ANALOG INPUT	RPM/SEC	1000	0			0	0	
Inputs: EVAL	From: DMOTOR.ACCEL.inp										Conn. No.: 128
Outputs: (None)											
Tasks:											
DATSPEED	DIR MOTOR AT SPEED	0.5	DIGITAL INPUT								N
Inputs: EVAL	From: DMOTOR.inatspd.di0										Conn. No.: 124
Outputs: (None)											
Display/Item: MASFPISM / CIRCLE RAD=15	Param: DOUT				Type: COLOR ACTION						Pos: [655,761]
Tasks:											
DDECEL	DIR MOTOR DECEL RATE	0.5	ANALOG INPUT	RPM/SEC	1000	0			0	0	
Inputs: EVAL	From: DMOTOR.DECCEL.inp										Conn. No.: 129
Outputs: (None)											
Tasks:											
DDISP		0.5	pulse								
Inputs: (None)											
Outputs: DOUT	To: DDISP.INP1										Conn. No.: 396
Tasks:											
DECELCHG		0.25	ALARM						1e+09	-1e+10	
Inputs: MEAS	From: UDECEL.OUT										Conn. No.: 4e+02
SP	ODECEL.OUT										4e+02
Outputs: DALM	To: CHGCHK1.INP3										Conn. No.: 4e+02

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Tasks:											
DELPUL		0.5	pulse								
Inputs: (None)											
Outputs: DOUT		To: DELPUL.INP1				Conn. No.: 294					
Tasks:											
DEV 3	[PLC I/O; Driver = Modicon 984]		I/O HARDWARE								
Inputs: MODBS+ GROUP 2 #1		From: I2C1.PAOT				Conn. No.: 204					
MODBS+ GROUP 2 #2		I2C2.PAOT				205					
Outputs: MODBS+ GROUP 1 #0		To: I1C0.MEAS				Conn. No.: 182					
MODBS+ GROUP 1 #11		I1C11.MEAS				183					
MODBS+ GROUP 1 #12		I1C12.MEAS				184					
Tasks:											
DEV 4	[PLC I/O; Driver = Modicon 984]		I/O HARDWARE								
Inputs: MODBS+ GROUP 3 #1		From: ST8WDRES.DOUT				Conn. No.: 155					
MODBS+ GROUP 3 #10		A5ABRT.DOUT				211					
MODBS+ GROUP 3 #8		PBENAB.DOUT				212					
Outputs: MODBS+ GROUP 1 #0		To: J1C0.MEAS				Conn. No.: 206					
MODBS+ GROUP 2 #0		J2C0.PDIN				207					
MODBS+ GROUP 2 #1		J2C1.PDIN				208					
MODBS+ GROUP 2 #2		J2C2.PDIN				209					
Tasks:											
DF262799	USED AS A CONSTANT 262799	0.5	ANALOG INPUT		262799	262799		0	0		
Inputs: (None)											
Outputs: OUT		To: PBRAMPHL.INP				Conn. No.: 450					
Tasks:											
DFAULT	DIR MOTOR FAULT	0.5	DIGITAL INPUT								N
Inputs: EVAL		From: DMOTOR.infault.di0				Conn. No.: 122					
Outputs: (None)											
Display/Item: MASFPOS / CIRCLE RAD=15		Param: DOUT		Type: COLOR ACTION			Pos: [507,688]				
Tasks:											
DFLT0	USED AS CONSTANT 0	0.5	ANALOG INPUT		0	0		0	0		
Inputs: (None)											
Outputs: OUT		To: PBRAMPHL.INP2				Conn. No.: 449					
Tasks:											
DFLT1	USED AS CONSTANT 1	0.5	ANALOG INPUT		1	1		0	0		
Inputs: (None)											
Outputs: OUT		To: SPDABOFF.INP				Conn. No.: 442					

Genesis Strategy Data Dictionary											
TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	OUT		SPDALOFF.INP								443
	OUT		SWCABRT.INP								464
	OUT		SWCALRM.INP								460
	OUT		SWCSPDAB.INP								446
	OUT		SWCSPDAL.INP								447
Tasks:											
DFORWARD	DIR MOTOR IN FORWARD	0.5	DIGITAL INPUT								N
Inputs: EVAL		From: DMOTOR.inforwrld.di0						Conn. No.: 123			
Outputs: (None)											
Display/Item: MASFPOSM / CIRCLE RAD=15		Param: DOUT		Type: COLOR ACTION				Pos: [652,895]			
Tasks:											
DISMOV	DISABLE MOVE IF WITHIN BAND	0.5	FX		0	0					
Inputs: DIN1		From: DISMOVE.DOUT						Conn. No.: 10			
DIN2		POSCNTRL.DOUT						50			
DIN3		POSCNTRL.DO2						51			
Outputs: DO2		To: INBAND.EVAL						Conn. No.: 52			
DOUT		GOSTOP.CONT						8			
Tasks:											
DISMOV1		0.1	sand								
Inputs: INP1		From: DMPROB.DOUT						Conn. No.: 402			
INP2		DISMOVE.QNOT						412			
INP3		DRUN.QNOT						413			
INP4		DSTOP.DOUT						414			
Outputs: DOUT		To: DISP1.DIN4						Conn. No.: 416			
Tasks:											
DISMOVE	DISABLE MOVE	0.5	DIGITAL INPUT								N
Inputs: (None)											
Outputs: DOUT		To: DISMOV.DIN1						Conn. No.: 10			
QNOT		BACKWARD.INP2						9			
QNOT		DISMOV1.INP2						412			
QNOT		FORWARD.INP2						0			
QNOT		HOLDENMO.CONT						423			
QNOT		STRTAND.INP4						12			
Display/Item: MASFPOSM / STATE SELECTOR		Param: DOUT		Type: STATE SELECTOR				Pos: [43,679]			
Tasks:											
DISP1		0.5	DISP								
Inputs: DIN1		From: STOP2.DOUT						Conn. No.: 220			

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	DIN2		ON.DOUT								22
	DIN3		PBPOSAN2.DOUT								356
	DIN4		DISMOV1.DOUT								416
	DIN5		DMDISP.DOUT								417
	Outputs: (None)										
	Tasks:										
DISP2		0.5	DISP								
	Inputs: DIN1		From: CHKCLR1.DOUT								Conn. No.: 332
	DIN2		BUMPENAB.DOUT								333
	Outputs: (None)										
	Tasks:										
DISP3	USED FOR PROBLEM DISPLAYS	0.5	DISP								
	Inputs: DIN1		From: PBENADIS.DOUT								Conn. No.: 261
	DIN2		DMPROBDI.DOUT								58
	DIN3		PSDISP.DOUT								277
	DIN4		SEDISP.DOUT								288
	DIN5		POSDISP.DOUT								321
	Outputs: (None)										
	Tasks:										
DISP4		0.5	DISP								
	Inputs: DIN1		From: STOPTEST.DOUT								Conn. No.: 104
	Outputs: (None)										
	Tasks:										
DISPRABT	DISCH PRESSURE ABORT	0.5	ANALOG INPUT	PSID	2400.55	0			0	0	
	Inputs: EVAL		From: CALDISPR.OUT3								Conn. No.: 165
	Outputs: OUT		To: I2C1.AI2								Conn. No.: 167
	Tasks:										
DISPRALM	DISCH PRESSURE ALARM	0.5	ANALOG INPUT	PSID	2400.55	0			0	0	
	Inputs: EVAL		From: CALDISPR.OUT2								Conn. No.: 164
	Outputs: OUT		To: I2C2.AI8								Conn. No.: 170
	Tasks:										
DISPRPRE	PREDICTED DISCHARGE PRESSUR	0.5	ANALOG INPUT	PSID	150	0			0	0	
	Inputs: EVAL		From: CALDISPR.OUT								Conn. No.: 163
	Outputs: (None)										
	Tasks:										
DLINEV	DIR MOTOR LINE VOLTAGE	0.5	ANALOG INPUT	VOLTS	460	0			0	0	
	Inputs: EVAL		From: DMOTOR.LINEV.inp								Conn. No.: 130

Genesis Strategy Data Dictionary											
TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Outputs: (None)											
Display/Item: MASFPOSM / PROCESS POINT		Param: OUT		Type: PROCESS POINT				Pos: [689,517]			
Tasks:											
DMAXSPD	DIR MOTOR MAXIMUM SPEED	0.5	ANALOG INPUT	RPM	1200	0			0	0	
Inputs: EVAL		From: DMOTOR.MAXSPD.inp						Conn. No.: 127			
Outputs: (None)											
Tasks:											
DMDISP		0.5	sand								
Inputs: INP1		From: DDISP.DOUT						Conn. No.: 398			
INP2		DMPROB.DOUT						397			
Outputs: DOUT		To: DISP1.DIN5						Conn. No.: 417			
Tasks:											
DMOTOR		0.5	INT I/O MODEL DEVICE								
Inputs: forwrld.do0		From: GOFORWRD.DOUT						Conn. No.: 37			
revers.do0		GOREVERS.DOUT						2			
start.do0		STARTSHT.DOUT						60			
stop.do0		STOP2.DOUT						49			
Outputs: ACCEL.fail		To: COMMOR.INP1						Conn. No.: 69			
ACCEL.inp		DACCEL.EVAL						128			
DECEL.inp		DDECEL.EVAL						129			
FREQ.inp		VR232090.EVAL						63			
inatspd.di0		DATSPEED.EVAL						124			
Infault.di0		DFAULT.EVAL						122			
inforwrld.di0		DFORWARD.EVAL						123			
inforwrld.di0		FOROVER.INP1						23			
inforwrld.di0		FSTRTDEL.INP2						216			
inforwrld.di0		HILIMAND.INP2						44			
inforwrld.di0		HILIMIT.INP3						32			
inready.di0		DREADY.EVAL						119			
inrevers.di0		DREVERSE.EVAL						126			
inrevers.di0		LOLIMAND.INP2						48			
Inrevers.di0		LOLIMIT.INP3						33			
inrevers,dj0		REVOVER.INP1						29			
inrevers.di0		RSTRTDEL.INP2						217			
inrun.di0		DRUN.EVAL						120			
inrun.di0		FOROVER.INP3						38			
inrun.di0		HILIMIT.INP2						14			

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	inrun.di0		LOLIMIT.INP2							31	
	inrun.di0		NOTRUN.INP1							20	
	inrun.di0		REVOVER.INP3							39	
	instoppd.di0		DSTOP.EVAL							121	
	LINEV.inp		DLINEV.EVAL							130	
	LOAD.inp		VR232070.EVAL							61	
	MAXSPD.inp		DMAXSPD.EVAL							127	
	MOTORA.inp		VR232100.EVAL							64	
	MOTORV.inp		VR232080.EVAL							62	
	reven.di0		DREVENAB.EVAL							125	
	SPDSET.inp		VR232120.EVAL							67	
	SPEED.inp		VR232110.EVAL							66	
Display/Item:	MASFROSM / DATA ENTRY	Param:	SPDSET.outp		Type:	DATA ENTRY		Pos:	[240, 79]		
	MASFROSM / DATA ENTRY		ACCEL.outp			DATA ENTRY			[227,162]		
	MASFROSM / DATA ENTRY		DECEL.outp			DATA ENTRY			[226,121]		
	MASFROSM / CIRCLE RAD=15		inatspd.di0			COLOR ACTION			[655,761]		
R&R File:	PBSETVAL.RPS (line 50)	Line:	@SET(DMOTOR.SPDS,100) ; Set desired speed of position motor,								
	PBSETVAL.RPS (line 51)		@SET(DMOTOR.ACCE,500) ; Set acceleration of position motor,								
	PBSETVAL.RPS (line 52)		@SET(DMOTOR.DECE,500) ; Set deceleration of position motor.								
Tasks:											
DMPROB		0.25	rs FLIP FLOP								
Inputs:	INP1	From:	ENMOVPU.DOUT						Conn. No.:	405	
	INP2		DMPROBR.DOUT							403	
Outputs:	DOUT	To:	DISMOV1.INP1						Conn. No.:	402	
	DOUT		DMDISP.INP2							397	
	DOUT		PBDMPROB.INP1							418	
Display/Item:	DMPROB / TEXT="?" DOT	Param:	DOUT		Type:	FLASH ACTION		Pos:	[840,140]		
	MASFROSM / SYMBOL :2		DOUT			FLASH ACTION			[523, 41]		
Tasks:											
DMPROBDI		0.5	sand								
Inputs:	INP1	From:	PBDMPROB.DOUT						Conn. No.:	424	
	INP2		PDISP.DOUT							419	
	INP3		POSDISP.QNOT							420	
Outputs:	DOUT	To:	DISP3.DIN2						Conn. No.:	58	
Tasks:											
DMPROBR		0.1	sor								
Inputs:	INP1	From:	RDMPROB.DOUT						Conn. No.:	399	

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	INP2		NODMPROB.DOUT								401
Outputs:	DOUT		To: DMPROB.INP2								Conn. No.: 403
Tasks:											
DO1-6DEV		0.1	sor								
Inputs:	INP1		From: DO1DEV.DALM								Conn. No.: 236
	INP2		DO2DEV.DALM								237
	INP3		DO3DEV.DALM								238
	INP4		DO4DEV.DALM								239
	INP5		DO5DEV.DALM								240
	INP6		DO6DEV.DALM								241
Outputs:	DOUT		To: DO1-7DEV.INP2								Conn. No.: 242
Tasks:											
DO1-7DEV		0.1	sor								
Inputs:	INP1		From: DO7DEV.DALM								Conn. No.: 243
	INP2		DO1-6DEV.DOUT								242
	INP3		PBCHK1.DALM								270
Outputs:	QNOT		To: NOPENAB.INP2								Conn. No.: 265
	QNOT		PBENAND.INP1								255
Tasks:											
DO1DEV	PB CHECK FOR PUMP POSITION	0.25	ALARM	DEGREES					0	0	
Inputs:	MEAS		From: POSITION.OUT								Conn. No.: 225
Outputs:	DALM		To: DO1-6DEV.INP1								Conn. No.: 236
	DALM		INPOSI.INP1								324
Display/Item:	PBENPROB / TEXT="PUMP POSI.."		D Param: DALM								Pos: [100,480]
R&R File:	PBSETVAL.RPS (line 41)		Line: @SET(DO1DEV.SETP,POSITION.OUT) ; Position check for PUMP BUMP indication.								
	PBSETVAL.RPS (line 68)		@SET(DO1DEV.SETP,UANGLE.OUT) ; Position check for PBTESTS indication.								
Tasks:											
DO2DEV	PB CHECK FOR DESIRED PUMP SP	0.25	ALARM	RPM					0	0	
Inputs:	MEAS		From: VR232060.OUT								Conn. No.: 226
Outputs:	DALM		To: DO1-6DEV.INP2								Conn. No.: 237
Display/Item:	PBENPROB / TEXT="DESIRED P.."		D Param: DALM								Pos: [100,440]
R&R File:	PBSETVAL.RPS (line 44)		Line: @SET(DO2DEV.SETP,PMOTOR.SPDS) ; Desired speed check for PBTESTS indication.								
	PBSETVAL.RPS (line 76)		@SET(DO2DEV.SETP,USPEED.OUT) ; Desired speed check for PBTESTS indication.								
Tasks:											
DO3DEV	PB CHECK FOR PUMP ACCELERATI	0.25	ALARM	RPM					0	0	
Inputs:	MEAS		From: PACCEL.OUT								Conn. No.: 227
Outputs:	DALM		To: DO1-6DEV.INP3								Conn. No.: 238

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Display/Item: PBENPROB / TEXT="PUMP ACCE••" Param: DALM Type: SELECTION LIST Pos: [100,400]											
R&R File: PBSETVAL.RPS (line 37) Line: @SET(DO3DEV.SETP,PMOTOR.ACCE) ; Pump acceleration check for PBTESTS indication.											
PBSETVAL.RPS (line 56) @SET(DO3DEV.SETP,UACCEL.OUT) ; Pump acceleration check for PBTESTS indication.											
Tasks:											
DO4DEV	PB CHECK FOR PUMP DECELERATI	0.25	ALARM	RPM					0	0	
Inputs: MEAS From: PDECEL.OUT Conn. No.: 228											
Outputs: DALM To: DO1-6DEV.INP4 Conn. No.: 239											
Display/Item: PBENPROB / TEXT="PUMP DECE••" Param: DALM Type: SELECTION LIST Pos: [100,360]											
R&R File: PBSETVAL.RPS (line 38) Line: @SET(DO4DEV.SETP,PMOTOR.DECE) ; Pump deceleration check for PBTESTS indication.											
PBSETVAL.RPS (line 57) @SET(DO4DEV.SETP,UDECEL.OUT) ; Pump deceleration check for PBTESTS indication.											
Tasks:											
DO5DEV	PB CHECK FOR PUMP MAX SPEED	0.25	ALARM	RPM					0	0	
Inputs: MEAS From: PMAxSPD.OUT Conn. No.: 229											
Outputs: DALM To: DO1-6DEV.INP5 Conn. No.: 240											
Display/Item: PBENPROB / TEXT="PUMP MAXI••" D Param: DALM Type: SELECTION LIST Pos: [100,320]											
R&R File: PBSETVAL.RPS (line 45) Line: @SET(DO5DEV.SETP,PMOTOR.MAXS) ; Pump maximum speed check for PBTESTS indication.											
PBSETVAL.RPS (line 77) @SET(DO5DEV.SETP,USPEED.OUT) ; Pump maximum speed check for PBTESTS indication.											
Tasks:											
DO6DEV	PB CHECK FOR PUMP SPEED ALAR	0.25	ALARM	RPM					0	0	
Inputs: MEAS From: VR050HAV.OUT Conn. No.: 230											
Outputs: DALM To: DO1-6DEV.INP6 Conn. No.: 241											
Display/Item: PBENPROB / TEXT="PUMP SPEE••" Param: DALM Type: SELECTION LIST Pos: [100,280]											
R&R File: PBSETVAL.RPS (line 46) Line: @SET(DO6DEV.SETP,PMOTOR.MAXS+10) ; Pump speed alarm check for PBTESTS indication.											
PBSETVAL.RPS (line 78) @SET(DO6DEV.SETP,USPEED.OUT+10) ; Pump speed alarm check for PBTESTS indication.											
Tasks:											
DO7DEV	PB CHECK FOR PUMP SPEED ABOR	0.25	ALARM	RPM					0	0	
Inputs: MEAS From: HPSPDLIM.OUT Conn. No.: 231											
Outputs: DALM To: DO1-7DEV.INP1 Conn. No.: 243											
Display/Item: PBENPROB / TEXT="PUMP SPEE••" Param: DALM Type: SELECTION LIST Pos: [100,240]											
R&R File: PBSETVAL.RPS (line 47) Line: @SET(DO7DEV.SETP,PMOTOR.MAXS+20) ; Pump speed abort check for PBTESTS indication.											
PBSETVAL.RPS (line 79) @SET(DO7DEV.SETP,USPEED.OUT+20) ; Pump speed abort check for PBTESTS indication.											
Tasks:											
DREADY	DIR MOTOR READY	0.5	DIGITAL INPUT								N
Inputs: EVAL From: DMOTOR.inready.di0 Conn. No.: 119											
Outputs: (None)											
Display/Item: MASFPOSM / CIRCLE RAD=15 Param: DOUT Type: COLOR ACTION Pos: [506,897]											
Tasks:											

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
DREVENAB	DIR MOTOR REVERSE ENABLED	0.5	DIGITAL INPUT								N
Inputs: EVAL		From: DMOTOR.reven.di0						Conn. No.: 125			
Outputs: (None)											
Display/Item: MASFPOSM / CIRCLE RAD=15		Param: DOUT		Type: COLOR ACTION			Pos: [655,692]				
Tasks:											
DREVERSE	DIR MOTOR IN REVERSE	0.5	DIGITAL INPUT								N
Inputs: EVAL		From: DMOTOR.inrevers.di0						Conn. No.: 126			
Outputs: (None)											
Display/Item: MASFPOSM / CIRCLE RAD=15		Param: DOUT		Type: COLOR ACTION			Pos: [653,830]				
Tasks:											
DRUN	DIR MOTOR RUNNING	0.5	DIGITAL INPUT								N
Inputs: EVAL		From: DMOTOR.inrun.di0						Conn. No.: 120			
Outputs: QNOT		To: DISMOV1.INP3						Conn. No.: 413			
QNOT		NORUN.INP2						222			
Display/Item: MASFPOSM / CIRCLE RAD=15		Param: DOUT		Type: COLOR ACTION			Pos: [505,826]				
PBENPROB / TEXT="DIRECTION.." DOT		DOUT		SELECTION LIST			[100,680]				
POSPROB / TEXT="DIRECTION.." DOT		DOUT		SELECTION LIST			[80,500]				
PSPROB / TEXT="DIRECTION.." DOT		DOUT		SELECTION LIST			[80,460]				
SETPROB / TEXT="DIRECTION.." DOT		DOUT		SELECTION LIST			[80,500]				
Tasks:											
DSTOP	DIR MOTOR STOPPED	0.5	DIGITAL INPUT								N
Inputs: EVAL		From: DMOTOR.instoppd.di0						Conn. No.: 121			
Outputs: DOUT		To: DISMOV1.INP4						Conn. No.: 414			
DOUT		NORUN.INP1						221			
Display/Item: MASFPOSM / CIRCLE RAD=15		Param: DOUT		Type: COLOR ACTION			Pos: [507,757]				
PBENPROB / TEXT="DIRECTION.." DOT		QNOT		SELECTION LIST			[100,640]				
POSPROB / TEXT="DIRECTION.." DOT		QNOT		SELECTION LIST			[80,540]				
PSPROB / TEXT="DIRECTION.." DOT		QNOT		SELECTION LIST			[80,500]				
SETPROB / TEXT="DIRECTION.." DOT		QNOT		SELECTION LIST			[80,540]				
Tasks:											
ENABBUMP		2	pulse								
Inputs: (None)											
Outputs: DOUT		To: BENAB.INP1						Conn. No.: 71			
DOUT		ENABBUMP.INP1						59			
Tasks:											
ENCHECK	ENABLE PB COLOR CHECK	0.5	DIGITAL INPUT								N
Inputs: EVAL		From: RSCHECK.DOUT						Conn. No.: 235			

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Outputs: (None)											
Tasks:											
ENMOVPUL		1	pulse								
Inputs: INP1		From: ENMOVTON.DOUT						Conn. No.:		404	
Outputs: DOUT		To: DMPROB.INP1						Conn. No.:		405	
Tasks:											
ENMOVTON	USED TO DELAY ENABLE MOVE BIT	0.5	TON								
Inputs: CONT		From: HOLDENMO.DOUT						Conn. No.:		415	
Outputs: DOUT		To: ENMOVPUL.INP1						Conn. No.:		404	
Tasks:											
EQUSPD		0.5	FX		0	0					
Inputs: INP		From: VR232060.OUT						Conn. No.:		115	
INP2		VR232050.OUT								114	
Outputs: (None)											
Display/Item: MASFPUMP / FILLED BOX NORMAL		Param: DR1		Type: COLOR ACTION				Pos: [891,186]			
MASFPUMP / FILLED BOX NORMAL		DR1		COLOR ACTION				[928,186]			
Tasks:											
FOROVER		0.1	sand								
Inputs: INP1		From: DMOTOR.inforwrd.di0						Conn. No.:		23	
INP2		POSCNTRL.DO2								24	
INP3		DMOTOR.inrun.di0								38	
Outputs: DOUT		To: FOVRSTOP.CONT						Conn. No.:		25	
Tasks:											
FORWARD		0.1	sand								
Inputs: INP1		From: NOTRUN.DOUT						Conn. No.:		53	
INP2		DISMOVE.QNOT								0	
Outputs: QNOT		To: GOFORWRD.RSET						Conn. No.:		19	
Tasks:											
FOVRSTOP		0.1	ONE SHOT								
Inputs: CONT		From: FOROVER.DOUT						Conn. No.:		25	
Outputs: DOUT		To: STOP.INP2						Conn. No.:		27	
Tasks:											
FSTRTDEL		0.1	sand								
Inputs: INP1		From: GOFORWRD.DOUT						Conn. No.:		4	
INP2		DMOTOR.inforwrd.di0								216	
Outputs: DOUT		To: START.INP1						Conn. No.:		6	
Tasks:											

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
GOFORWRD		0.1	ONE SHOT								
Inputs: CONT	From: POSCNTRL.DOUT								Conn. No.:	16	
RSET	FORWARD.QNOT									19	
Outputs: DOUT	To: DMOTOR.forwrddo0								Conn. No.:	37	
DOUT	FSTRDEL.INP1									4	
Tasks:											
GOREVERS		0.1	ONE SHOT								
Inputs: CONT	From: POSCNTRL.DO2								Conn. No.:	17	
RSET	BACKWARD.QNOT									36	
Outputs: DOUT	To: DMOTOR.revers.do0								Conn. No.:	2	
DOUT	RSTRDEL.INP1									5	
Tasks:											
GOSTOP		0.5	ONE SHOT								
Inputs: CONT	From: DISMOV.DOUT								Conn. No.:	8	
Outputs: DOUT	To: STOP.INP1								Conn. No.:	15	
Tasks:											
HILIMAND		0.5	sand								
Inputs: INP1	From: POSITION.HALM								Conn. No.:	43	
INP2	DMOTOR.inforwrddi0									44	
Outputs: QNOT	To: NODMPROB.INP3								Conn. No.:	408	
QNOT	STRAND.INP2									41	
Display/Item:	DMPROB / TEXT="PUMP POSI.." DO Param: DOUT						Type: SELECTION LIST		Pos: [80,620]		
	MASFPOSM / TEXT="START INH.." DOT DOUT						COLOR ACTION		[33,607]		
Tasks:											
HILIMIT		0.5	sand								
Inputs: INP1	From: POSITION.HALM								Conn. No.:	1	
INP2	DMOTOR.inrun.di0									14	
INP3	DMOTOR.inforwrddi0									32	
Outputs: DOUT	To: STOP.INP4								Conn. No.:	34	
Tasks:											
HOLDENMO	HOLDS ENABLE MOVE BIT	0.5	ONE SHOT								
Inputs: CONT	From: DISMOVE.QNOT								Conn. No.:	423	
Outputs: DOUT	To: ENMOVTON.CONT								Conn. No.:	415	
Tasks:											
HPSPDLIM	HIGH SPEED ABORT LIMIT	0.5	ANALOG INPUT	RPM	1200	0			0	0	
Inputs: EVAL	From: I1C11.AO5								Conn. No.:	136	
Outputs: OUT	To: DO7DEV.MEAS								Conn. No.:	231	

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Display/Item: MASFPUMP / PROCESS POINT		Param: OUT		Type: PROCESS POINT				Pos: [568, 28]			
Tasks:											
HRSCHG		0.25	ALARM						1e+09	-1e+10	
Inputs: MEAS		From: UHRS.OUT		Conn. No.: 4e+02							
SP		OHRs.OUT		4e+02							
Outputs: DALM		To: CHGCHK1.INP5		Conn. No.: 4e+02							
Tasks:											
I1C0		0.5	PAK ANALOG INPUT								
Inputs: MEAS		From: DEV 3.MODBS+ GROUP 1 #0		Conn. No.: 182							
Outputs: AO3		To: POSITION.EVAL		Conn. No.: 142							
FAIL		PLCFAIL2.INP3		429							
Tasks:											
I1C11		0.5	PAK ANALOG INPUT								
Inputs: MEAS		From: DEV 3.MODBS+ GROUP 1 #11		Conn. No.: 183							
Outputs: AO1		To: PLCAMPAL.EVAL		Conn. No.: 219							
AO2		PLCAMPAB.EVAL		218							
AO3		PLCDPRAL.EVAL		168							
AO4		PLCDPRAB.EVAL		172							
AO5		HPSPDLIM.EVAL		136							
AO6		VR050HAV.EVAL		174							
AO7		PLCTIADD.INP		468							
AO8		PLCTIADD.INP2		469							
Tasks:											
I1C12		0.5	PAK ANALOG INPUT								
Inputs: MEAS		From: DEV 3.MODBS+ GROUP 1 #12		Conn. No.: 184							
Outputs: AO7		To: PLCCURAB.EVAL		Conn. No.: 169							
AO8		PLCCURAL.EVAL		141							
Tasks:											
I2C1		0.5	PAK ANALOG OUTPUT								
Inputs: AI1		From: SWCABRT.OUT		Conn. No.: 465							
AI2		DISPRABT.OUT		167							
AI3		PBCALSEC.OUT3		466							
AI4		SWCALRM.OUT		171							
AI5		PBCALSEC.OUT4		467							
AI6		SWCSPDAB.OUT		458							
AI7		SWCSPDAL.OUT		459							
AI8		VR232020.OUT		152							

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TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM												
Outputs: PAOT		To: DEV 3.MODBS+ GROUP 2 #1						Conn. No.: 204															
Tasks:																							
I2C2		0.5	PAK ANALOG OUTPUT																				
Inputs: AI1		From: VR232080.OUT						Conn. No.: 175															
AI2		VR232100.OUT						176															
AI3		VR232110.OUT						177															
AI4		VR232040.OUT						154															
AI5		VR232050.OUT						153															
AI8		DISPRALM.OUT						170															
Outputs: PAOT		To: DEV 3.MODBS+ GROUP 2 #2						Conn. No.: 205															
Tasks:																							
INBAND	HIGH IF IN DEADBAND	0.5	DIGITAL INPUT								N												
Inputs: EVAL		From: DISMOV.DO2						Conn. No.: 52															
Outputs: QNOT		To: NODMPROB.INP1						Conn. No.: 406															
Display/Item: DMPROB / TEXT="PUMP POSI.."		Param: DOUT		Type: SELECTION LIST			Pos: [80,660]																
MASFPOS / CIRCLE RAD=7		DOUT		COLOR ACTION			[77,550]																
MASFPOS / FILLED BOX NORMAL		DOUT		COLOR ACTION			[352,410]																
MASFPOS / FILLED BOX NORMAL		DOUT		COLOR ACTION			[352,376]																
Tasks:																							
INFILE	INDICATES TEST IS IN FILE	30	DIGITAL INPUT								N												
Inputs: (None)																							
Outputs: (None)																							
R&R File: DELETE.RPS (line 46)		Line: @set(INFILE.out,0)																					
ILOAD.RPS (line 17)		@set(INFILE.out,1)																					
ILOAD.RPS (line 29)		@set(INFILE.out,0)																					
ILOAD.RPS (line 38)		@set(INFILE.out,0)																					
NEXT.RPS (line 20)		@set(INFILE.out,1)																					
NEXT.RPS (line 38)		@set(INFILE.out,1)																					
PBSETVAL.RPS (line 81)		@if((INFILE.OUT == 0) or (CHANGED.OUT == 1)) ;check for test in file or changed.																					
PREV.RPS (line 28)		@set(INFILE.out,1)																					
SAVE.RPS (line 54)		@set(INFILE.out,1)																					
SAVE.RPS (line 66)		@set(INFILE.out,1)																					
ULOAD.RPS (line 17)		@set(INFILE.out,1)																					
ULOAD.RPS (line 24)		@set(INFILE.out,0)																					
ULOAD.RPS (line 32)		@set(INFILE.out,0)																					
ULOAD.RPS (line 42)		@set(INFILE.out,0)																					
Tasks:																							

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
INPOSI		0.5	not								
Inputs: INP1		From: DO1DEV.DALM						Conn. No.:		324	
Outputs: DOUT		To: POSSET.INP2						Conn. No.:		148	
Tasks:											
J1C0		0.5	PAK ANALOG INPUT								
Inputs: MEAS		From: DEV 4.MODBS+ GROUP 1 #0						Conn. No.:		206	
Outputs: AO3		To: TIR12A02.EVAL						Conn. No.:		143	
AO4		TIR12A01.EVAL								144	
Tasks:											
J2C0		0.5	PAK DIGITAL INPUT								NNNNNNNN NNNNNNNN
Inputs: PDIN		From: DEV 4.MODBS+ GROUP 2 #0						Conn. No.:		207	
Outputs: DO15		To: ZIMPE144.EVAL						Conn. No.:		147	
DO16		ZIMPE143.EVAL								146	
Tasks:											
J2C1		0.5	PAK DIGITAL INPUT								NNNNNNNN NNNNNNNN
Inputs: PDIN		From: DEV 4.MODBS+ GROUP 2 #1						Conn. No.:		208	
Outputs: DO1		To: MIP00001.EVAL						Conn. No.:		145	
Tasks:											
J2C2		0.5	PAK DIGITAL INPUT								NNNNNNNN NNNNNNNN
Inputs: PDIN		From: DEV 4.MODBS+ GROUP 2 #2						Conn. No.:		209	
Outputs: DO10		To: ABORT.EVAL						Conn. No.:		149	
DO11		PLCPBENA.EVAL								138	
DO12		PLCWD.INP								432	
DO16		NODEFAIL.EVAL								80	
Tasks:											
LOLIMAND		0.5	sand								
Inputs: INP1		From: POSITION.LALM						Conn. No.:		47	
INP2		DMOTOR.inrevers.di0								48	
Outputs: QNOT		To: NODMPROB.INP4						Conn. No.:		409	
QNOT		STRTAND.INP3								46	
Display/Item: DMPROB / TEXT="PUMP POSI••" DO				Param: DOUT		Type: SELECTION LIST		Pos: [80,580]			
MASFPOS / TEXT="START INH••" DOT				DOUT		COLOR ACTION		[33,607]			
Tasks:											
LOLIMIT		0.5	sand								

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Inputs: INP1	From: POSITION.LALM								Conn. No.:	13	
INP2	DMOTOR.inrun.di0									31	
INP3	DMOTOR.inrevers.di0									33	
Outputs: DOUT	To: STOP.INP5								Conn. No.:	35	
Tasks:											
MANUAL	Indicates manual test setup	30	DIGITAL INPUT								N
Inputs: (None)											
Outputs: (None)											
R&R File: PBSETVAL.RPS (line 82)	Line: @SET(MANUAL.OUT,1);test changed or not in file; indicate manual test.										
PBSETVAL.RPS (line 85)	@SET(MANUAL.OUT,0);Indicate valid test in file.										
Tasks:											
MAXINDX	USED TO DETERMIN MAX TESTS	30	ANALOG INPUT		1000	0			0	0	
Inputs: (None)											
Outputs: (None)											
R&R File: DELETE.RPS (line 14)	Line: @If(MAXINDX.out > 0)										
DELETE.RPS (line 15)	@set(MAXINDX.out,MAXINDX.out-1)										
ILOAD.RPS (line 23)	@set(MAXINDX.out,i)										
ILOAD.RPS (line 27)	@set(MAXINDX.out,0)										
ILOAD.RPS (line 36)	@set(MAXINDX.out,0)										
NEXT.RPS (line 3)	@If(MAXINDX.out == 0)										
PREV.RPS (line 3)	@If(MAXINDX.out == 0)										
PREV.RPS (line 10)	@set(i,MAXINDX.out)										
SAVE.RPS (line 29)	@set(MAXINDX.out,MAXINDX.out+1)										
SAVE.RPS (line 47)	@set(MAXINDX.out,MAXINDX.out+1)										
SAVE.RPS (line 63)	@set(MAXINDX.out,1)										
ULOAD.RPS (line 40)	@set(MAXINDX.out,0)										
Tasks:											
MINSCHG		0.25	ALARM						1e+09	-1e+10	
Inputs: MEAS	From: UMIN.OUT								Conn. No.:	4e+02	
SP	OMINS.OUT									4e+02	
Outputs: DALM	To: CHGCHK1.INP4								Conn. No.:	4e+02	
Tasks:											
MIP00001	MOISTURE IN PUMP MOTOR OIL	0.5	DIGITAL INPUT								Y
Inputs: EVAL	From: J2C1.DO1								Conn. No.:	145	
Outputs: (None)											
Tasks:											
NEXTINDX	INDEX POINTER TO TEST FILE	30	ANALOG INPUT		1000	0			0	0	

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Inputs: (None)											
Outputs: (None)											
R&R File:	DELETE.RPS (line 17)		Line: @if(NEXTINDX.out > 0)								
	DELETE.RPS (line 18)		@set(NEXTINDX.out,NEXTINDX.out-1)								
	ILOAD.RPS (line 18)		@set(NEXTINDX.out,i)								
	ILOAD.RPS (line 28)		@set(NEXTINDX.out,0)								
	ILOAD.RPS (line 37)		@set(NEXTINDX.out,0)								
	NEXT.RPS (line 8)		@set(i,NEXTINDX.out+1)								
	NEXT.RPS (line 21)		@set(NEXTINDX.out,i)								
	NEXT.RPS (line 39)		@set(NEXTINDX.out,i)								
	PREV.RPS (line 8)		@set(i,NEXTINDX.out)								
	PREV.RPS (line 15)		@set(i,NEXTINDX.out-1)								
	PREV.RPS (line 29)		@set(NEXTINDX.out,i)								
	SAVE.RPS (line 19)		@set(NEXTINDX.out,i)								
	SAVE.RPS (line 28)		@set(NEXTINDX.out,i)								
	SAVE.RPS (line 46)		@set(NEXTINDX.out,i)								
	SAVE.RPS (line 64)		@set(NEXTINDX.out,0)								
	ULOAD.RPS (line 18)		@set(NEXTINDX.out,i)								
	ULOAD.RPS (line 33)		@set(NEXTINDX.out,0)								
	ULOAD.RPS (line 41)		@set(NEXTINDX.out,0)								
Tasks:											
NEXTPUL		0.5	pulse								
Inputs: (None)											
Outputs: DOUT		To: NEXTPUL.INP1						Conn. No.: 303			
Tasks:											
NODEFAIL	STATION5 COMM FAIL	0.5	DIGITAL INPUT								Y
Inputs: EVAL		From: J2C2.DO16						Conn. No.: 80			
Outputs: DOUT		To: ABORTOR.INP3						Conn. No.: 213			
Display/Item: DMPROB / TEXT="STATION5 **"DOT		Param: DOUT		Type: SELECTION LIST				Pos: [80,380]			
POSPROB / TEXT="STATION5 **"DOT		DOUT		SELECTION LIST				[80,380]			
PSPROB / TEXT="STATION5 **"DOT		DOUT		SELECTION LIST				[80,340]			
Tasks:											
NODMPROB		0.1	sand								
Inputs: INP1		From: INBAND.QNOT						Conn. No.: 406			
INP2		ABORTOR.QNOT						407			
INP3		HILIMAND.QNOT						408			
INP4		LOLIMAND.QNOT						409			

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	INP5		PSTOP.DOUT								410
	INP6		PRUN.QNOT								411
	Outputs: DOUT		To: DMPROBR.INP2								Conn. No.: 401
	Tasks:										
NOPENAB		0.5	sand								
	Inputs: INP1		From: NORUN.DOUT								Conn. No.: 266
	INP2		DO1-7DEV.QNOT								265
	INP3		TSTRUNNG.QNOT								267
	INP4		POSORBUM.DOUT								268
	INP5		PBENRSRS.QNOT								438
	Outputs: DOUT		To: PENABR.INP1								Conn. No.: 262
	Tasks:										
NOPOPROB		0.5	sand								
	Inputs: INP1		From: TSTRUNNG.QNOT								Conn. No.: 315
	INP2		PBENABLE.QNOT								316
	INP3		VALSET.DOUT								317
	INP4		NORUN.DOUT								318
	INP5		ABORTOR.QNOT								299
	Outputs: DOUT		To: POSPROBR.INP1								Conn. No.: 314
	Tasks:										
NOPSPRO2		0.5	sand								
	Inputs: INP1		From: NOPSPROB.DOUT								Conn. No.: 275
	INP2		PBENTON.DO2								330
	INP3		PBSPLIT.DO3								434
	Outputs: DOUT		To: PSPROBR.INP1								Conn. No.: 329
	Tasks:										
NOPSPROB		0.5	sand								
	Inputs: INP1		From: PBENABLE.DOUT								Conn. No.: 279
	INP2		PLCPBENA.DOUT								280
	INP3		ABORTOR.QNOT								281
	INP4		VALSET.DOUT								282
	INP5		NORUN.DOUT								283
	Outputs: DOUT		To: NOPSPRO2.INP1								Conn. No.: 275
	Tasks:										
NORUN		0.5	sand								
	Inputs: INP1		From: DSTOP.DOUT								Conn. No.: 221
	INP2		DRUN.QNOT								222

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	INP3		PSTOP.DOUT								223
	INP4		PRUN.QNOT								224
Outputs:	DOUT		To: NOPENAB.INP1						Conn. No.:		266
	DOUT		NOPOPROB.INP4								318
	DOUT		NOPSPROB.INP5								283
	DOUT		NOSEPROB.INP3								292
	DOUT		PBCHKCLR.INP1								251
	DOUT		PBPOSAND.INP4								310
	DOUT		PBSETAND.INP3								285
	DOUT		PBSTRAND.INP6								271
	DOUT		PENABA.INP3								364
	DOUT		POSPROBA.INP3								360
	DOUT		SETPROBA.INP2								354
	QNOT		RESETBEN.INP4								471
Display/Item: MASFPUMP / BOX NORMAL		Param: QNOT		Type: COLOR ACTION				Pos: [469,413]			
Tasks:											
NOSEPROB		0.5	sand								
Inputs:	INP1		From: PBENABLE.QNOT						Conn. No.:		290
	INP2		TSTRUNNG.QNOT								291
	INP3		NORUN.DOUT								292
Outputs:	DOUT		To: SETPROBR.INP1						Conn. No.:		334
Tasks:											
NOTRUN		0.5	not								
Inputs:	INP1		From: DMOTOR.inrun.di0						Conn. No.:		20
Outputs:	DOUT		To: BACKWARD.INP1						Conn. No.:		3
	DOUT		FORWARD.INP1								53
Tasks:											
OACCEL	DESIRED PUMP ACCELERATION	30	ANALOG INPUT	RPM	500	0			0	0	
Inputs: (None)											
Outputs:	OUT		To: ACCELCHG.SP						Conn. No.:		380
R&R File: SETOLD.RPS (line 6)		Line: @SET(OACCEL.OUT,UACCEL.OUT)									
Tasks:											
OANGLE	DIR MOTOR ANGLE FOR TEST SETU	30	ANALOG INPUT		360	0			0	0	
Inputs: (None)											
Outputs:	OUT		To: ANGLECHG.SP						Conn. No.:		372
R&R File: SETOLD.RPS (line 1)		Line: @SET(OANGLE.OUT,UANGLE.OUT)									
Tasks:											

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
ODECEL	DESIRED PUMP DECELERATION	30	ANALOG INPUT	RPM	500	0			0	0	
Inputs: (None)											
Outputs: OUT				To: DECELCHG.SP				Conn. No.: 382			
R&R File: SETOLD.RPS (line 7)				Line: @SET(ODECEL.OUT,UDECEL.OUT)							
Tasks:											
OHRS	DESIRED TEST HOURS	30	ANALOG INPUT	HOURS	18	0			0	0	
Inputs: (None)											
Outputs: OUT				To: HRSCHG.SP				Conn. No.: 376			
R&R File: SETOLD.RPS (line 3)				Line: @SET(OHRS.OUT,UHRS.OUT)							
Tasks:											
OLDTEST	USED TO CHECK OLD W/ NEW TES	30	ANALOG INPUT		99.9	0			0	0	
Inputs: (None)											
Outputs: OUT				To: TESTCHG.SP				Conn. No.: 301			
R&R File: ILOAD.RPS (line 2)				Line: @set(OLDTEST.out,UTESTNO.out)							
ULOAD.RPS (line 2)				@set(OLDTEST.out,UTESTNO.out)							
Tasks:											
OMINS	DESIRED TEST MINUTES	30	ANALOG INPUT	MINS.	59	0			0	0	
Inputs: (None)											
Outputs: OUT				To: MINSCHG.SP				Conn. No.: 391			
R&R File: SETOLD.RPS (line 4)				Line: @SET(OMINS.OUT,UMINS.OUT)							
Tasks:											
ON	ALWAYS ON	1	DIGITAL INPUT								N
Inputs: (None)											
Outputs: DOUT				To: ANTON.CONT				Conn. No.: 70			
DOUT				DISP1.DIN2				22			
DOUT				TESTSET2.DIN4				307			
Tasks:											
ORESTIM	BIT TO RESET TEST ELAPSED TIME	30	DIGITAL INPUT								N
Inputs: (None)											
Outputs: DOUT				To: RESCHG.INP2				Conn. No.: 384			
R&R File: SETOLD.RPS (line 8)				Line: @SET(ORESTIM.DOUT,URESTIM.DOUT)							
Tasks:											
OSECS	DESIRED TEST TIME SECONDS	30	ANALOG INPUT	SECONDS	59	0			0	0	
Inputs: (None)											
Outputs: OUT				To: SECSCHG.SP				Conn. No.: 378			
R&R File: SETOLD.RPS (line 5)				Line: @SET(OSECS.OUT,USECS.OUT)							
Tasks:											

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
OSPEED	PUMP SPEED FOR TEST SETUP	30	ANALOG INPUT	RPM	1200	0			0	0	
Inputs: (None)											
Outputs: OUT		To: SPEEDCHG.SP						Conn. No.: 374			
R&R File: SETOLD.RPS (line 2)		Line: @SET(OSPEED.OUT,USPEED.OUT)									
Tasks:											
PACCEL	PUMP MOTOR ACCELERATION	0.5	ANALOG INPUT	RPM/SEC	500	0			0	0	
Inputs: EVAL		From: PMOTOR.ACCEL.inp						Conn. No.: 201			
Outputs: OUT		To: DO3DEV.MEAS						Conn. No.: 227			
Tasks:											
PATSPEED	PUMP MOTOR AT SPEED	0.5	DIGITAL INPUT								N
Inputs: EVAL		From: PMOTOR.inatspd.di0						Conn. No.: 199			
Outputs: (None)											
Display/Item: MASFPUMP / CIRCLE RAD=10		Param: DOUT		Type: COLOR ACTION				Pos: [631,814]			
Tasks:											
PB30SEC	30 SECONDS UNTIL END OF TEST	0.5	ALARM						E	-1	
Inputs: HALM		From: PBCALSEC.OUT2						Conn. No.: 95			
MEAS		PBRAMP.OUT						179			
Outputs: (None)											
Tasks:											
PBBUTSTP		1	pulse								
Inputs: (None)											
Outputs: DOUT		To: PBBUTSTP.INP1						Conn. No.: 112			
Tasks:											
PBCALSEC		0.5	FX		262799	0					
Inputs: DIN1		From: TSTRUNNG.DOUT						Conn. No.: 370			
INP		PBMIN.OUT						86			
INP2		PBSEC.OUT						102			
INP3		PBHR.OUT						110			
Outputs: OUT		To: PBCHK1.MEAS						Conn. No.: 137			
OUT		PBSPLIT.INP						180			
OUT2		PB30SEC.HALM						95			
OUT3		I2C1.AI3						466			
OUT4		I2C1.AI5						467			
Tasks:											
PBCHK1	PB ENABLE CHECK FOR TEST TIME	0.25	ALARM						0	0	
Inputs: MEAS		From: PBCALSEC.OUT						Conn. No.: 137			
SP		PLCPBTIM.OUT						269			

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Outputs: DALM		To: DO1-7DEV.INP3						Conn. No.:		270	
Display/Item: PBENPROB / TEXT="PLC TEST.."DO Param: DALM				Type: SELECTION LIST				Pos: [100,520]			
Tasks:											
PBCHKCLR		0.1	sand								
Inputs: INP1		From: NORUN.DOUT						Conn. No.:		251	
INP2		TSTRUNNG.QNOT								252	
INP3		POSORBUM.DOUT								453	
INP4		CHKCOLOR.DOUT								81	
INP5		PBENABLE.QNOT								358	
Outputs: DOUT		To: PBENAND.INP2						Conn. No.:		264	
DOUT		RSCHECK.INP1								257	
Tasks:											
PBDMPROB		0.5	sand								
Inputs: INP1		From: DMPROB.DOUT						Conn. No.:		418	
INP2		VALSET.DOUT								425	
INP3		POSSET.QNOT								426	
Outputs: DOUT		To: DMPROBDI.INP1						Conn. No.:		424	
DOUT		PBPROB2.INP2								422	
Tasks:											
PBDNTM		0.5	DIGITAL INPUT								N
Inputs: EVAL		From: PBSPLIT.DOUT						Conn. No.:		88	
Outputs: DOUT		To: STOPTEST.INP2						Conn. No.:		113	
Tasks:											
PBENAB	PHASE B TEST ENABLE TO PLC	0.5	DIGITAL OUTPUT								
Inputs: INP		From: PBENABLE.DOUT						Conn. No.:		151	
Outputs: DOUT		To: DEV 4.MODBS+ GROUP 3 #8						Conn. No.:		212	
Tasks:											
PBENABLE		0.25	rs FLIP FLOP								
Inputs: INP1		From: PBENAND.DOUT						Conn. No.:		244	
INP2		PBENOR.DOUT								250	
Outputs: DOUT		To: NOPSPROB.INP1						Conn. No.:		279	
DOUT		PBENAB.INP								151	
DOUT		PBENTON.CONT								256	
DOUT		PBSTRAND.INP1								118	
DOUT		PSPROBA.INP3								369	
DOUT		RESETBEN.INP3								470	
QNOT		NOPOPROB.INP2								316	

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	QNOT		NOSEPROB.INP1								290
	QNOT		PBCHKCLR.INP5								358
	QNOT		PBPOSAND.INP2								308
	QNOT		PBSETAND.INP1								97
	QNOT		PENABA.INP2								272
Display/Item:	MASFPUMP / BOX NORMAL	Param:	QNOT		Type:	COLOR ACTION		Pos:	[469,413]		
	MASFPUMP / BOX NORMAL		DOUT			COLOR ACTION			[669,413]		
	POSPROB / TEXT="TEST IS E.." DOT		DOUT			SELECTION LIST			[80,700]		
	PSPROB / TEXT="TEST NOT .."DOT		QNOT			SELECTION LIST			[80,700]		
	SETPROB / TEXT="TEST ALRE.." DOT		DOUT			SELECTION LIST			[80,700]		
Tasks:											
PBENADIS		0.5	sand								
Inputs:	INP1		From: PDISP.DOUT						Conn. No.:	259	
	INP2		PENAB.DOUT							260	
Outputs:	DOUT		To: DISP3.DIN1						Conn. No.:	261	
Tasks:											
PBENAND		0.1	sand								
Inputs:	INP1		From: DO1-7DEV.QNOT						Conn. No.:	255	
	INP2		PBCHKCLR.DOUT							264	
Outputs:	DOUT		To: PBENABLE.INP1						Conn. No.:	244	
Tasks:											
PBENOR		0.25	sor								
Inputs:	INP1		From: STOPTEST.DOUT						Conn. No.:	232	
	INP2		PBENREST.DOUT							92	
Outputs:	DOUT		To: PBENABLE.INP2						Conn. No.:	250	
Tasks:											
PBENREST	PHASE B ENABLE TIMED OUT	0.5	TON								
Inputs:	CONT		From: PBENTIMO.DOUT						Conn. No.:	325	
Outputs:	DOUT		To: PBENOR.INP2						Conn. No.:	92	
	DOUT		PENABOR.INP2							436	
Tasks:											
PBENRSRS		0.5	rs FLIP FLOP								
Inputs:	INP1		From: PBENTIMO.DOUT						Conn. No.:	439	
	INP2		RPENAB.DOUT							437	
Outputs:	QNOT		To: NOPENAB.INP5						Conn. No.:	438	
Display/Item:	PBENPROB / TEXT="TEST ENAB.." D	Param:	DOUT		Type:	SELECTION LIST		Pos:	[100,800]		
Tasks:											

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANGE	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
PBENTIMO		0.1	sand								
Inputs: INP1	From: PBENTON.DOUT									Conn. No.: 326	
INP2	TSTRUNNG.QNOT									327	
Outputs: DOUT	To: PBENREST.CONT									Conn. No.: 325	
DOUT	PBENRSRS.INP1									439	
Tasks:											
PBENTON	PHASE B ENABLE TIMEOUT TIMER	0.5	TON								
Inputs: CONT	From: PBENABLE.DOUT									Conn. No.: 256	
Outputs: DO2	To: NOPSPRO2.INP2									Conn. No.: 330	
DO2	PBSTRAN2.INP3									328	
DOUT	PBENTIMO.INP1									326	
Tasks:											
PBHR		0.5	ANALOG INPUT		72	0			0	0	
Inputs: (None)											
Outputs: OUT	To: PBCALSEC.INP3									Conn. No.: 110	
Display/Item: MASFPUMP / DATA ENTRY	Param: OUT									Pos: [53,640]	
R&R File: PBSETVAL.RPS (line 66)	Line: @SET(PBHR.OUT,UHRS.OUT) ; Set desired hours for test operation.										
Tasks:											
PBMIN		0.5	ANALOG INPUT		59	0			0	0	
Inputs: (None)											
Outputs: OUT	To: PBCALSEC.INP									Conn. No.: 86	
Display/Item: MASFPUMP / DATA ENTRY	Param: OUT									Pos: [100,640]	
R&R File: PBSETVAL.RPS (line 64)	Line: @SET(PBMIN.OUT,UMINS.OUT) ; Set desired minutes for pump operation.										
Tasks:											
PBPOSAN2		0.1	sand								
Inputs: INP1	From: PBPOSAND.DOUT									Conn. No.: 312	
INP2	POSSET.QNOT									355	
Outputs: DOUT	To: DISP1.DIN3									Conn. No.: 356	
Tasks:											
PBPOSAND		0.1	sand								
Inputs: INP1	From: TSTRUNNG.QNOT									Conn. No.: 289	
INP2	PBENABLE.QNOT									308	
INP3	VALSET.DOUT									309	
INP4	NORUN.DOUT									310	
INP5	PBPOSPMP.DOUT									311	
INP6	ABORTOR.QNOT									295	
Outputs: DOUT	To: PBPOSAN2.INP1									Conn. No.: 312	

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Tasks:											
PBPOSPMP		1	pulse								
Inputs: (None)											
Outputs: DOUT		To: PBPOSAND.INP5						Conn. No.:		311	
DOUT		PBPOSPMP.INP1								99	
Tasks:											
PBPROB	PHASE B TEST PROBLEM	0.5	OR								N
Inputs: INP1		From: PENAB.DOUT						Conn. No.:		263	
INP2		PSPROB.DOUT								276	
INP3		SETPROB.DOUT								234	
INP4		PBPROB2.DOUT								341	
Outputs: (None)											
Display/Item: MASFPUMP / SYMBOL :2		Param: DOUT		Type: FLASH ACTION				Pos: [843, 20]			
PBENPROB / TEXT="?" DOT		DOUT		FLASH ACTION				[880,120]			
POSPROB / TEXT="?" DOT		DOUT		FLASH ACTION				[880,140]			
PSPROB / TEXT="?" DOT		DOUT		FLASH ACTION				[880,140]			
SETPROB / TEXT="?" DOT		DOUT		FLASH ACTION				[880,140]			
Tasks:											
PBPROB2		0.5	sor								
Inputs: INP1		From: POSPROB.DOUT						Conn. No.:		421	
INP2		PBDMPROB.DOUT								422	
Outputs: DOUT		To: PBPROB.INP4						Conn. No.:		341	
Tasks:											
PBRAMP	PUMP OPERATION ELAPSED TIME	1	RAMP	SECONDS	262799	0	E	0	0	0	
Inputs: HLIM		From: PBRAMPHL.OUT						Conn. No.:		87	
RP10		TSTRUNNG.DOUT								90	
RSET		SETVALDN.DOUT								82	
Outputs: OUT		To: PB30SEC.MEAS						Conn. No.:		179	
OUT		PBSPLIT.INP2								85	
Tasks:											
PBRAMPHL	PBRAMP HI LIMIT	0.5	SWCH	SECONDS	262799	0	262799	0			
Inputs: INP		From: DF262799.OUT						Conn. No.:		450	
INP2		DFLT0.OUT								449	
SWCH		SETVALDN.DOUT								451	
Outputs: OUT		To: PBRAMP.HLIM						Conn. No.:		87	
Tasks:											
PBREPORT		1	REPORT								

Genesis Strategy Data Dictionary

MSPT Sim, Version 1.01

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Inputs: DIN1		From: PBSETAND.DOUT						Conn. No.:		94	
Outputs: (None)											
R&R File: PBSETVAL.RPS (line 31 Comment)		Line: ; Reference: PBREPORT.SOURCE_FILE1									
Tasks:											
PBSEC		0.5	ANALOG INPUT		59	0			0	0	
Inputs: (None)											
Outputs: OUT		To: PBCALSEC.INP2						Conn. No.:		102	
Display/Item: MASFPUMP / DATA ENTRY		Param: OUT		Type: DATA ENTRY				Pos: [146,640]			
R&R File: PBSETVAL.RPS (line 65)		Line: @SET(PBSEC.OUT,USECS.OUT) ; Set desired seconds for pump operation.									
Tasks:											
PBSETAND		0.1	sand								
Inputs: INP1		From: PBENABLE.QNOT						Conn. No.:		97	
INP2		TSTRUNNG.QNOT								284	
INP3		NORUN.DOUT								285	
INP4		SETTEST.DOUT								83	
INP5		VALSET.QNOT								352	
Outputs: DOUT		To: PBREPORT.DIN1						Conn. No.:		94	
R&R File: PBSETVAL.RPS (line 28 Comment)		Line: ; PBSETAND.DOUT is set high by the operator selecting to set values.									
Tasks:											
PBSPLIT		0.5	FX		0	0					
Inputs: DIN1		From: TSTRUNNG.DOUT						Conn. No.:		91	
INP		PBCALSEC.OUT								180	
INP2		PBRAMP.OUT								85	
Outputs: DO3		To: NOPSPRO2.INP3						Conn. No.:		434	
DO3		PBSTRAN2.INP4								433	
DOUT		PBDNTM.EVAL								88	
Display/Item: MASFPUMP / PROCESS POINT		Param: AR1		Type: PROCESS POINT				Pos: [253,637]			
MASFPUMP / PROCESS POINT		AR2		PROCESS POINT				[300,637]			
MASFPUMP / PROCESS POINT		AR3		PROCESS POINT				[346,637]			
PSPROB / TEXT="DESIRED T.." DOT		DO2		SELECTION LIST				[80,260]			
Tasks:											
PBSTRAN2		0.1	sand								
Inputs: INP1		From: PBSTRAND.DOUT						Conn. No.:		273	
INP2		ABORTOR.QNOT								322	
INP3		PBENTON.DO2								328	
INP4		PBSPLIT.DO3								433	
Outputs: DOUT		To: PBSTRTDN.EVAL						Conn. No.:		323	

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANGE	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Tasks:											
PBSTRAND		0.1	sand								
Inputs: INP1	From: PBENABLE.DOUT									Conn. No.:	118
INP2	PLCPBENA.DOUT										101
INP3	PBSTTEST.DOUT										117
INP4	TSTRUNNG.QNOT										156
INP5	VALSET.DOUT										157
INP6	NORUN.DOUT										271
Outputs: DOUT	To: PBSTRAN2.INP1									Conn. No.:	273
Tasks:											
PBSTRTDN		1	DIGITAL INPUT								N
Inputs: EVAL	From: PBSTRAN2.DOUT									Conn. No.:	323
Outputs: DOUT	To: PMOTOR.start.do0									Conn. No.:	56
DOUT	TSTRUNNG.INP1										245
Tasks:											
PBSTTEST		1	pulse								
Inputs: (None)											
Outputs: DOUT	To: PBSTRAND.INP3									Conn. No.:	117
DOUT	PBSTTEST.INP1										100
Tasks:											
PBTESTNO	PHASE B TEST NUMBER	0.5	ANALOG INPUT		99.9	0			0	0	
Inputs: (None)											
Outputs: (None)											
R&R File: PBSETVAL.RPS (line 83)	Line: @SET(PBTESTNO.OUT,0) ;and clear test number.										
PBSETVAL.RPS (line 86)	@SET(PBTESTNO.OUT,UTESTNO.OUT) ;Set current test number										
Tasks:											
PDECEL	PUMP MOTOR DECERATION	0.5	ANALOG INPUT	RPM/SEC	500	0			0	0	
Inputs: EVAL	From: PMOTOR.DECCEL.inp									Conn. No.:	202
Outputs: OUT	To: DO4DEV.MEAS									Conn. No.:	228
Tasks:											
PDISP		0.5	pulse								
Inputs: (None)											
Outputs: DOUT	To: DMPROBDI.INP2									Conn. No.:	419
DOUT	PBENADIS.INP1										259
DOUT	PDISP.INP1										258
Tasks:											
PENAB		0.5	rs FLIP FLOP								

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANGE	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Inputs: INP1	From: PENABOR.DOUT									Conn. No.: 435	
Inputs: INP2	From: PENABR.DOUT									342	
Outputs: DOUT	To: PBENADIS.INP2									Conn. No.: 260	
Outputs: DOUT	To: PBPROB.INP1									263	
Tasks:											
PENABA		0.1	sor								
Inputs: INP1	From: CHKCLRTN.DOUT									Conn. No.: 254	
Inputs: INP2	From: PBENABLE.QNOT									272	
Inputs: INP3	From: NORUN.DOUT									364	
Inputs: INP4	From: POSORBUM.DOUT									365	
Outputs: DOUT	To: PENABOR.INP1									Conn. No.: 363	
Tasks:											
PENABOR		0.1	sor								
Inputs: INP1	From: PENABA.DOUT									Conn. No.: 363	
Inputs: INP2	From: PBENREST.DOUT									436	
Outputs: DOUT	To: PENAB.INP1									Conn. No.: 435	
Tasks:											
PENABR		0.5	sor								
Inputs: INP1	From: NOPENAB.DOUT									Conn. No.: 262	
Inputs: INP2	From: RPENAB.DOUT									344	
Inputs: INP3	From: PBBUTSTP.DOUT									350	
Outputs: DOUT	To: PENAB.INP2									Conn. No.: 342	
Tasks:											
PFAULT	PUMP MOTOR IN FAULT	0.5	DIGITAL INPUT								N
Inputs: EVAL	From: PMOTOR.infault.di0									Conn. No.: 196	
Outputs: (None)											
Display/Item: MASFPUMP / CIRCLE RAD=10	Param: DOUT									Pos: [491,754]	
Tasks:											
PFORWARD	PUMP MOTOR IN FORWARD	0.5	DIGITAL INPUT								N
Inputs: EVAL	From: PMOTOR.inforwrld.di0									Conn. No.: 197	
Outputs: (None)											
Display/Item: MASFPUMP / CIRCLE RAD=10	Param: DOUT									Pos: [631,894]	
Tasks:											
PLCAMPAB	FROM PLC, AMPS ABORT LIMIT	0.5	ANALOG INPUT	AMPS	225	0			0	0	
Inputs: EVAL	From: I1C11.AO2									Conn. No.: 218	
Outputs: (None)											
Tasks:											

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
PLCAMPAL	FROM PLC, AMPS ALARM LIMIT	0.5	ANALOG INPUT	AMPS	225	0			0	0	
Inputs: EVAL		From: I1C11.AO1						Conn. No.: 219			
Outputs: (None)											
Tasks:											
PLCCURAB	FROM PLC, PUMP CURRENT ABORT	0.5	ANALOG INPUT	AMPS	225	0			0	0	
Inputs: EVAL		From: I1C12.AO7						Conn. No.: 169			
Outputs: (None)											
Display/Item: MASFPUMP / PROCESS POINT		Param: OUT		Type: PROCESS POINT				Pos: [673,187]			
Tasks:											
PLCCURAL	FROM PLC, PUMP CURRENT ALARM	0.5	ANALOG INPUT	AMPS	225	0			0	0	
Inputs: EVAL		From: I1C12.AO8						Conn. No.: 141			
Outputs: (None)											
Display/Item: MASFPUMP / PROCESS POINT		Param: OUT		Type: PROCESS POINT				Pos: [673,227]			
Tasks:											
PLCDPRAB	FROM PLC, DISCH PRESS ABORT	0.5	ANALOG INPUT	PSID	2400.55	0			0	0	
Inputs: EVAL		From: I1C11.AO4						Conn. No.: 172			
Outputs: (None)											
Tasks:											
PLCDPRAL	FROM PLC, DISCH PRESS ALARM	0.5	ANALOG INPUT	PSID	2400.55	0			0	0	
Inputs: EVAL		From: I1C11.AO3						Conn. No.: 168			
Outputs: (None)											
Tasks:											
PLCFAIL	FAILURE OF PLC COMMUNICATION	0.5	DIGITAL INPUT								Y
Inputs: EVAL		From: PLCFAIL2.DOUT						Conn. No.: 246			
Outputs: DOUT		To: ABORTOR.INP4						Conn. No.: 248			
Display/Item: DMPROB / TEXT="PLC COMMU••" D		Param: DOUT		Type: SELECTION LIST				Pos: [80,340]			
POSPROB / TEXT="PLC COMMU••" DOT		DOUT		SELECTION LIST				[80,340]			
PSPROB / TEXT="PLC COMMU••" DOT		DOUT		SELECTION LIST				[80,300]			
Tasks:											
PLCFAIL2	WATCH PLC FAILURE	0.5	OR								N
Inputs: INP1		From: PLCWDON.DOUT						Conn. No.: 427			
INP2		PLCWDOFF.DOUT						428			
INP3		I1C0.FAIL						429			
Outputs: DOUT		To: PLCFAILEVAL						Conn. No.: 246			
Tasks:											
PLCPBENA	TEST ENABLE FROM PLC	0.5	DIGITAL INPUT								N
Inputs: EVAL		From: J2C2.DO11						Conn. No.: 138			

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Outputs: DOUT	To: NOPSPROB.INP2									280	
DOUT	PBSTRAND.INP2									101	
Display/Item: MASFPUMP / CIRCLE RAD=15	Param: DOUT									Pos: [526,361]	
PSPROB / TEXT="PLC TEST **DOT	QNOT									[80,660]	
Tasks:											
PLCPBTIM	PLC DESIRED TEST TIME	0.5	ANALOG INPUT	SEC	262799	0			0	0	
Inputs: EVAL	From: PLCTIADD.OUT									Conn. No.: 134	
Outputs: OUT	To: PBCHK1.SP									Conn. No.: 269	
Tasks:											
PLCTIADD	USED TO ADD HOURS AND SECON	0.5	ADDER	SECS	262799	0	262799	0			
Inputs: INP	From: I1C11.AO7									Conn. No.: 468	
INP2	I1C11.AO8									469	
Outputs: OUT	To: PLCPBTIM.EVAL									Conn. No.: 134	
Tasks:											
PLCWD	WATCH DOG FROM PLC	0.1	NOT								N
Inputs: INP	From: J2C2.DO12									Conn. No.: 432	
Outputs: DOUT	To: PLCWDOFF.CONT									Conn. No.: 431	
QNOT	PLCWDON.CONT									430	
Tasks:											
PLCWDOFF	WATCH DOG ON PLC FOR OFF	0.25	TON								
Inputs: CONT	From: PLCWD.DOUT									Conn. No.: 431	
Outputs: DOUT	To: PLCFAIL2.INP2									Conn. No.: 428	
Tasks:											
PLCWDON	WATCH DOG ON PLC FOR ON	0.25	TON								
Inputs: CONT	From: PLCWD.QNOT									Conn. No.: 430	
Outputs: DOUT	To: PLCFAIL2.INP1									Conn. No.: 427	
Tasks:											
PLINEV	PUMP MOTOR LINE VOLTAGE	0.5	ANALOG INPUT	VOLTS	460	0			0	0	
Inputs: EVAL	From: PMOTOR.LINEV.inp									Conn. No.: 191	
Outputs: (None)											
Display/Item: MASFPUMP / PROCESS POINT	Param: OUT									Pos: [650,617]	
Tasks:											
PMAXSPD	PUMP MOTOR MAXIMUM SPEED	0.5	ANALOG INPUT	RPM	1200	0			0	0	
Inputs: EVAL	From: PMOTOR.MAXSPD.inp									Conn. No.: 203	
Outputs: OUT	To: DO5DEV.MEAS									Conn. No.: 229	
Tasks:											
PMOTOR	PUMP MOTOR VFD	0.5	INT I/O MODEL DEVICE								

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Inputs: forwrd.do0	From: COMMOR.QNOT								Conn. No.:	55	
start.do0	PBSTRTDN.DOUT									56	
stop.do0	STOPTEST.DOUT									57	
Outputs: ACCEL.fail	To: COMMOR.INP2								Conn. No.:	192	
ACCEL.inp	PACCEL.EVAL									201	
DECEL.inp	PDECEL.EVAL									202	
FREQ.inp	VR232030.EVAL									187	
inatspd.di0	PATSPEED.EVAL									199	
infault.di0	PFAULT.EVAL									196	
inforwrd.di0	PFORWARD.EVAL									197	
inready.di0	PREADY.EVAL									193	
inrevers.di0	PREVERSE.EVAL									198	
inrun.di0	PRUN.EVAL									194	
instoppd.di0	PSTOP.EVAL									195	
LINEV.inp	PLINEV.EVAL									191	
LOAD.inp	VSDRS232.EVAL									185	
MAXSPD.inp	PMAXSPD.EVAL									203	
MAXSPD.inp	SPDABOFF.INP2									444	
MAXSPD.inp	SPDALOFF.INP2									445	
MOTORA.inp										188	
MOTORV.inp	VR232020.EVAL									186	
reven.di0	PREVENAB.EVAL									200	
SPDSET.inp	CALCURR.INP									158	
SPDSET.inp	CALDISPR.INP									159	
SPDSET.inp	VR232060.EVAL									190	
SPEED.inp	VR232050.EVAL									189	
Display/Item: CURDPRLM / PROCESS POINT	Param: SPDSET.inp				Type: PROCESS POINT				Pos: [511,676]		
MASFPUMP / DATA ENTRY	MAXSPD.outp				DATA ENTRY				[240,240]		
MASFPUMP / DATA ENTRY	SPDSET.outp				DATA ENTRY				[240,200]		
MASFPUMP / DATA ENTRY	ACCEL.outp				DATA ENTRY				[240,340]		
MASFPUMP / DATA ENTRY	DECEL.outp				DATA ENTRY				[240,300]		
R&R File: PBSETVAL.RPS (line 37)	Line: @SET(DO3DEV.SETP,PMOTOR.ACCE) ; Pump acceleration check for PBTESTS indication.										
PBSETVAL.RPS (line 38)	@SET(DO4DEV.SETP,PMOTOR.DECE) ; Pump deceleration check for PBTESTS indication.										
PBSETVAL.RPS (line 44)	@SET(DO2DEV.SETP,PMOTOR.SPDS) ; Desired speed check for PBTESTS indication.										
PBSETVAL.RPS (line 45)	@SET(DO5DEV.SETP,PMOTOR.MAXS) ; Pump maximum speed check for PBTESTS indication.										
PBSETVAL.RPS (line 46)	@SET(DO6DEV.SETP,PMOTOR.MAXS+10) ; Pump speed alarm check for PBTESTS indication.										
PBSETVAL.RPS (line 47)	@SET(DO7DEV.SETP,PMOTOR.MAXS+20) ; Pump speed abort check for PBTESTS indication.										

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	PBSETVAL.RPS (line 53)		@SET(PMOTOR.ACCE,UACCEL.OUT) ; Set acceleration of pump motor.								
	PBSETVAL.RPS (line 54)		@SET(PMOTOR.DECE,UDECEL.OUT) ; Set deceleration of pump motor.								
	PBSETVAL.RPS (line 69)		@SET(PMOTOR.MAXS,USPEED.OUT) ; Set pump motor maximum speed.								
	PBSETVAL.RPS (line 72)		@SET(PMOTOR.SPDS,USPEED.OUT) ; Set pump motor desired speed.								
Tasks:											
PMPSPDAB		0.5	ANALOG INPUT		1200	0			0	0	
Inputs:	EVAL		From:	SPDABOFF.OUT					Conn. No.:	440	
Outputs:	OUT		To:	SWCSPDAB.INP2					Conn. No.:	133	
R&R File:	PBSETVAL.RPS (line 42 Comment)		Line:	; Setting PMPSPDAB.OUT is removed of MASFPUMP.							
	PBSETVAL.RPS (line 74)		@SET(PMPSPDAB.OUT,USPEED.OUT+20) ; Set pump motor abort limit.								
Tasks:											
PMPSPDAL		0.5	ANALOG INPUT		1200	0			0	0	
Inputs:	EVAL		From:	SPDALOFF.OUT					Conn. No.:	441	
Outputs:	OUT		To:	SWCSPDAL.INP2					Conn. No.:	135	
R&R File:	PBSETVAL.RPS (line 43 Comment)		Line:	; Setting PMPSPDAL.OUT is removed of MASFPUMP.							
	PBSETVAL.RPS (line 73)		@SET(PMPSPDAL.OUT,USPEED.OUT+10) ; Set pump motor alarm limit.								
Tasks:											
POSCNTRL	PUMP POSITION CONTROL	0.1	DGAP								
Inputs:	MEAS		From:	POSITION.OUT					Conn. No.:	11	
Outputs:	DO2		To:	DISMOV.DIN3					Conn. No.:	51	
	DO2			FOROVER.INP2						24	
	DO2			GOREVERS.CONT						17	
	DOUT			DISMOV.DIN2						50	
	DOUT			GOFORWRD.CONT						16	
	DOUT			REVOVER.INP2						30	
Display/Item:	MASFPOSM / DATA ENTRY		Param:	HGAP		Type:	DATA ENTRY		Pos:	[726,245]	
	MASFPOSM / DATA ENTRY			LGAP			DATA ENTRY			[726,197]	
	MASFPOSM / DATA ENTRY			SETP			DATA ENTRY			[274,755]	
	MASFPOSM / FILLED BOX NORMAL			SETP			LOCATION ACTION			[352,376]	
R&R File:	PBSETVAL.RPS (line 63)		Line:	@SET(POSCNTRL.SETP,UANGLE.OUT) ; Set desired pump position.							
Tasks:											
POSDISP		0.5	sand								
Inputs:	INP1		From:	PDISP.DOUT					Conn. No.:	320	
	INP2			POSPROB.DOUT						313	
Outputs:	DOUT		To:	DISP3.DIN5					Conn. No.:	321	
	QNOT			DMPROBDI.INP3						420	
Tasks:											

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
POSITION	POSITION FROM PLC	0.5	ANALOG INPUT	DEG	190	0			190	15	
Inputs: EVAL		From: I1C0.AO3						Conn. No.:		142	
I ALM		ANTON.DO2								181	
Outputs: HALM		To: HILIMAND.INP1						Conn. No.:		43	
HALM		HILIMIT.INP1								1	
LALM		LOLIMAND.INP1								47	
LALM		LOLIMIT.INP1								13	
OUT		DO1DEV.MEAS								225	
OUT		POSCNTRL.MEAS								11	
Display/Item: MASFPOSM / DATA ENTRY		Param: LALV		Type: DATA ENTRY				Pos: [700,293]			
MASFPOSM / DATA ENTRY		HALV		DATA ENTRY				[700,338]			
MASFPOSM / TEXT="HI LIMIT" DOT		HALM		COLOR ACTION				[274,693]			
MASFPOSM / TEXT="LO LIMIT" DOT		LALM		COLOR ACTION				[274,641]			
MASFPOSM / PROCESS POINT		OUT		PROCESS POINT				[273,797]			
MASFPOSM / FILLED BOX NORMAL		OUT		LOCATION ACTION				[352,410]			
MASFPUMP / PROCESS POINT		OUT		PROCESS POINT				[207,483]			
R&R File: PBSETVAL.RPS (line 41)		Line: @SET(DO1DEV.SETP,POSITION.OUT) ; Position check for PUMP BUMP indication.									
Tasks:											
POSORBUM		0.1	sor								
Inputs: INP1		From: POSSET.DOUT						Conn. No.:		253	
INP2		BENAB.DOUT								452	
Outputs: DOUT		To: CHKANDPO.INP2						Conn. No.:		455	
DOUT		NOPENAB.INP4								268	
DOUT		PBCHKCLR.INP3								453	
DOUT		PENABA.INP4								365	
Tasks:											
POSPROB		0.5	rs FLIP FLOP								
Inputs: INP1		From: POSPROBA.DOUT						Conn. No.:		362	
INP2		POSPROBR.DOUT								338	
Outputs: DOUT		To: PBPROB2.INP1						Conn. No.:		421	
DOUT		POSDISP.INP2								313	
Tasks:											
POSPROBA		0.1	sand								
Inputs: INP1		From: PBPOSPMP.DOUT						Conn. No.:		319	
INP2		POSSET.QNOT								359	
INP3		NORUN.DOUT								360	
INP4		VALSET.DOUT								361	

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TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Outputs: DOUT		To: POSPROB.INP1		Conn. No.: 362							
Tasks:											
POSPROBR		0.5	sor								
Inputs: INP1		From: NOOPROB.DOUT		Conn. No.: 314							
INP2		RPOSPROB.DOUT		340							
INP3		PBBUTSTP.DOUT		349							
Outputs: DOUT		To: POSPROB.INP2		Conn. No.: 338							
Tasks:											
POSSET	PUMP IS IN POSITION & VALSET	0.5	AND								N
Inputs: INP1		From: VALSET.DOUT		Conn. No.: 140							
INP2		INPOSI.DOUT		148							
Outputs: DOUT		To: POSORBUM.INP1		Conn. No.: 253							
QNOT		PBDMPROB.INP3		426							
QNOT		PBPOSAN2.INP2		355							
QNOT		POSPROBA.INP2		359							
Tasks:											
PREADY	PUMP MOTOR READY	0.5	DIGITAL INPUT								N
Inputs: EVAL		From: PMOTOR.inready.di0		Conn. No.: 193							
Outputs: (None)											
Display/Item: MASFPUMP / CIRCLE RAD=10		Param: DOUT		Type: COLOR ACTION		Pos: [491,914]					
Tasks:											
PREVENAB	PUMP MOTOR REVERSE ENABLED	0.5	DIGITAL INPUT								N
Inputs: EVAL		From: PMOTOR.reven.di0		Conn. No.: 200							
Outputs: (None)											
Display/Item: MASFPUMP / CIRCLE RAD=10		Param: DOUT		Type: COLOR ACTION		Pos: [631,774]					
Tasks:											
PREVERSE	PUMP MOTOR IN REVERSE	0.5	DIGITAL INPUT								N
Inputs: EVAL		From: PMOTOR.inrevers.di0		Conn. No.: 198							
Outputs: (None)											
Display/Item: MASFPUMP / CIRCLE RAD=10		Param: DOUT		Type: COLOR ACTION		Pos: [631,854]					
Tasks:											
PREVPUL		0.5	pulse								
Inputs: (None)											
Outputs: DOUT		To: PREVPUL.INP1		Conn. No.: 304							
Tasks:											
PRUN	PUMP MOTOR RUNNING	0.5	DIGITAL INPUT								N
Inputs: EVAL		From: PMOTOR.inrun.di0		Conn. No.: 194							

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Outputs: QNOT	To: NODMPROB.INP6									Conn. No.: 411	
QNOT	NORUN.INP4									224	
QNOT	STRTAND.INP6									132	
Display/Item: DMPROB / TEXT="PUMP MOTO*" D	Param: DOUT				Type: SELECTION LIST				Pos: [80,500]		
MASFPUMP / CIRCLE RAD=10	DOUT				COLOR ACTION				[491,854]		
PBENPROB / TEXT="PUMP MOTO*" DOT	DOUT				SELECTION LIST				[100,760]		
POSPROB / TEXT="PUMP MOTO*" DOT	DOUT				SELECTION LIST				[80,580]		
PSPROB / TEXT="PUMP MOTO*" DOT	DOUT				SELECTION LIST				[80,540]		
SETPROB / TEXT="PUMP MOTO*" DOT	DOUT				SELECTION LIST				[80,580]		
Tasks:											
PSDISP		0.5	sand								
Inputs: INP1	From: PDISP.DOUT									Conn. No.: 278	
INP2	PSPROB.DOUT									274	
Outputs: DOUT	To: DISP3.DIN3									Conn. No.: 277	
Tasks:											
PSPROB		0.5	rs FLIP FLOP								
Inputs: INP1	From: PSPROBA.DOUT									Conn. No.: 367	
INP2	PSPROBR.DOUT									345	
Outputs: DOUT	To: PBPROB.INP2									Conn. No.: 276	
DOUT	PSDISP.INP2									274	
Tasks:											
PSPROBA		0.1	sand								
Inputs: INP1	From: PBSTTEST.DOUT									Conn. No.: 366	
INP2	TSTRUNNG.QNOT									368	
INP3	PBENABLE.DOUT									369	
Outputs: DOUT	To: PSPROB.INP1									Conn. No.: 367	
Tasks:											
PSPROBR		0.5	sor								
Inputs: INP1	From: NOPSPRO2.DOUT									Conn. No.: 329	
INP2	RSPROB.DOUT									347	
INP3	PBBUTSTP.DOUT									351	
Outputs: DOUT	To: PSPROB.INP2									Conn. No.: 345	
Tasks:											
PSTOP	PUMP MOTOR STOPPED	0.5	DIGITAL INPUT								N
Inputs: EVAL	From: PMOTOR.instoppd.di0									Conn. No.: 195	
Outputs: DOUT	To: NODMPROB.INP5									Conn. No.: 410	
DOUT	NORUN.INP3									223	

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANGE	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	DOUT		STRAND.INP5								131
Display/Item:	DMPROB / TEXT="PUMP MOTO..." D	Param:	QNOT		Type:	SELECTION LIST		Pos:	[80,540]		
	MASFPUMP / CIRCLE RAD=10		DOUT			COLOR ACTION			[491,814]		
	PBENPROB / TEXT="PUMP MOTO..." DOT		QNOT			SELECTION LIST			[100,720]		
	POSPROB / TEXT="PUMP MOTO..." DOT		QNOT			SELECTION LIST			[80,620]		
	PSPROB / TEXT="PUMP MOTO..." DOT		QNOT			SELECTION LIST			[80,580]		
	SETPROB / TEXT="PUMP MOTO..." DOT		QNOT			SELECTION LIST			[80,620]		
Tasks:											
RDMPROB		0.5	pulse								
Inputs: (None)											
Outputs:	DOUT		To: DMPROBR.INP1						Conn. No.:	399	
	DOUT		RDMPROB.INP1							400	
Tasks:											
RESCHG		0.5	sxor								
Inputs:	INP1		From: URESTIM.DOUT						Conn. No.:	383	
	INP2		ORESTIM.DOUT							384	
Outputs:	DOUT		To: CHANGED.INP1						Conn. No.:	388	
Tasks:											
RESETBEN		0.1	sor								
Inputs:	INP1		From: CHKANDPO.DOUT						Conn. No.:	74	
	INP2		SETPROB.DOUT							75	
	INP3		PBENABLE.DOUT							470	
	INP4		NORUN.QNOT							471	
Outputs:	DOUT		To: BENAB.INP2						Conn. No.:	73	
Tasks:											
RESETPB		1	pulse								
Inputs: (None)											
Outputs:	DOUT		To: RESETPB.INP1						Conn. No.:	111	
R&R File: PBSETVAL.RPS (line 39) Line: @SET(RESETPB.OUT,1) ; Reset overall test time.											
PBSETVAL.RPS (line 60) @SET(RESETPB.OUT,1) ; Reset overall test time.											
Tasks:											
RECOVER		0.1	sand								
Inputs:	INP1		From: DMOTOR.inrevers.di0						Conn. No.:	29	
	INP2		POSCNTRL.DOUT							30	
	INP3		DMOTOR.inrun.di0							39	
Outputs:	DOUT		To: ROVRSTOP.CONT						Conn. No.:	26	
Tasks:											

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
ROVRSTOP		0.1	ONE SHOT								
	Inputs: CONT		From: REVOVER.DOUT							Conn. No.:	26
	Outputs: DOUT		To: STOP.INP3							Conn. No.:	28
	Tasks:										
RPENAB		0.5	pulse								
	Inputs: (None)										
	Outputs: DOUT		To: PBENRSRS.INP2							Conn. No.:	437
	DOUT		PENABR.INP2								344
	DOUT		RPENAB.INP1								343
	Tasks:										
RPOSPROB		0.5	pulse								
	Inputs: (None)										
	Outputs: DOUT		To: POSPROBR.INP2							Conn. No.:	340
	DOUT		RPOSPROB.INP1								339
	Tasks:										
RSPROB		0.5	pulse								
	Inputs: (None)										
	Outputs: DOUT		To: PSPROBR.INP2							Conn. No.:	347
	DOUT		RSPROB.INP1								346
	Tasks:										
RSCHECK		0.5	rs FLIP FLOP								
	Inputs: INP1		From: PBCHKCLR.DOUT							Conn. No.:	257
	INP2		RSCHECKR.DOUT								233
	Outputs: DOUT		To: ENCHECK.EVAL							Conn. No.:	235
	Tasks:										
RSCHECKR		0.5	sor								
	Inputs: INP1		From: SETVALDN.DOUT							Conn. No.:	98
	INP2		STOPTTEST.DOUT								103
	Outputs: DOUT		To: RSCHECK.INP2							Conn. No.:	233
	Tasks:										
RSECPB	OVERALL ELAPSED TEST TIME	1	RAMP	SECONDS	262799	0	262799	0	0	0	
	Inputs: RP10		From: TSTRUNNG.DOUT							Conn. No.:	89
	RSET		RESETPB.DOUT								105
	Outputs: OUT		To: SPLITPB.INP							Conn. No.:	109
	Tasks:										
RSETPROB		0.5	pulse								
	Inputs: (None)										

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Outputs: DOUT		To: RSETPROB.INP1						Conn. No.:		336	
Tasks:											
RSTRTDEL		0.1	sand								
Inputs: INP1		From: GOREVERS.DOUT						Conn. No.:		5	
INP2		DMOTOR.inrevers.di0								217	
Outputs: DOUT		To: START.INP2						Conn. No.:		21	
Tasks:											
SAVEPUL		0.5	pulse								
Inputs: (None)											
Outputs: DOUT		To: SAVEPUL.INP1						Conn. No.:		293	
Tasks:											
SECSCHG		0.25	ALARM						1e+09	-1e+10	
Inputs: MEAS		From: USECS.OUT						Conn. No.:		4e+02	
SP		OSECS.OUT								4e+02	
Outputs: DALM		To: CHGCHK1.INP1						Conn. No.:		4e+02	
Tasks:											
SEDISP		0.5	sand								
Inputs: INP1		From: PDISP.DOUT						Conn. No.:		287	
INP2		SETPROB.DOUT								286	
Outputs: DOUT		To: DISP3.DIN4						Conn. No.:		288	
Tasks:											
SETPROB		0.5	rs FLIP FLOP								
Inputs: INP1		From: SETPROBA.DOUT						Conn. No.:		84	
INP2		SETPROBR.DOUT								348	
Outputs: DOUT		To: PBPROB.INP3						Conn. No.:		234	
DOUT		RESETBEN.INP2								75	
DOUT		SEDISP.INP2								286	
Tasks:											
SETPROBA		0.1	sand								
Inputs: INP1		From: SETTEST.DOUT						Conn. No.:		353	
INP2		NORUN.DOUT								354	
INP3		VALSET.QNOT								357	
Outputs: DOUT		To: SETPROB.INP1						Conn. No.:		84	
Tasks:											
SETPROBR		0.5	sor								
Inputs: INP1		From: NOSEPROB.DOUT						Conn. No.:		334	
INP2		RSETPROB.DOUT								335	

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	INP3		PBBUTSTP.DOUT								337
	Outputs: DOUT		To: SETPROB.INP2								Conn. No.: 348
	Tasks:										
SETTEST		1	pulse								
	Inputs: (None)										
	Outputs: DOUT		To: PBSETAND.INP4								Conn. No.: 83
	DOUT		SETPROBA.INP1								353
	DOUT		SETTEST.INP1								96
	Tasks:										
SETVALDN		1	DIGITAL INPUT								N
	Inputs: (None)										
	Outputs: DOUT		To: PBRAMP.RSET								Conn. No.: 82
	DOUT		PBRAMPHL.SWCH								451
	DOUT		RSHECKR.INP1								98
	DOUT		VALSET.INP1								249
	R&R File: PBSETVAL.RPS (line 91)		Line: @SET(SETVALDN.OUT,1) ; Set indication that values are set successfully.								
	Tasks:										
SPDABOFF	PUMP MOTOR SPEED ABORT OFFS	0.5	ADDER	RPM	1200	0	1200	0			
	Inputs: INP		From: DFLT1.OUT								Conn. No.: 442
	INP2		PMOTOR.MAXSPD.inp								444
	Outputs: OUT		To: PMPSPDAB.EVAL								Conn. No.: 440
	Tasks:										
SPDALOFF	PUMP MOTOR SPEED ALARM OFFS	0.5	ADDER	RPM	1200	0	1200	0			
	Inputs: INP		From: DFLT1.OUT								Conn. No.: 443
	INP2		PMOTOR.MAXSPD.inp								445
	Outputs: OUT		To: PMPSPDAL.EVAL								Conn. No.: 441
	Tasks:										
SPEEDCHG		0.25	ALARM						1e+09	-1e+10	
	Inputs: MEAS		From: USPEED.OUT								Conn. No.: 4e+02
	SP		OSPEED.OUT								4e+02
	Outputs: DALM		To: CHGCHK1.INP6								Conn. No.: 4e+02
	Tasks:										
SPLITPB		0.5	FX		0	0					
	Inputs: INP		From: RSECPB.OUT								Conn. No.: 109
	Outputs: (None)										
	Tasks:										
ST8WDRES	WATCHDOG BIT	0.5	DIGITAL OUTPUT								

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	Inputs: INP		From: WATCHDOG.DOUT							Conn. No.:	210
	Outputs: DOUT		To: DEV 4.MODBS+ GROUP 3 #1							Conn. No.:	155
	Tasks:										
START		0.1	sor								
	Inputs: INP1		From: FSTRTDEL.DOUT							Conn. No.:	6
	INP2		RSTRTDEL.DOUT								21
	Outputs: DOUT		To: STRTAND.INP1							Conn. No.:	7
	Tasks:										
STARTAND		0.1	sand								
	Inputs: INP1		From: STRTAND.DOUT							Conn. No.:	45
	INP2		ABORTOR.QNOT								214
	Outputs: DOUT		To: STARTSHT.CONT							Conn. No.:	54
	Tasks:										
STARTSHT	ONE SHOT FOR START	0.5	ONE SHOT								
	Inputs: CONT		From: STARTAND.DOUT							Conn. No.:	54
	Outputs: DOUT		To: DMOTOR.start.do0							Conn. No.:	60
	Tasks:										
STOP		0.1	sor								
	Inputs: INP1		From: GOSTOP.DOUT							Conn. No.:	15
	INP2		FOVRSTOP.DOUT								27
	INP3		ROVRSTOP.DOUT								28
	INP4		HILIMIT.DOUT								34
	INP5		LOLIMIT.DOUT								35
	INP6		BUTPULSE.DOUT								40
	Outputs: DOUT		To: STOP2.INP1							Conn. No.:	18
	Tasks:										
STOP2		0.1	sor								
	Inputs: INP1		From: STOP.DOUT							Conn. No.:	18
	INP2		STOPTEST.DOUT								215
	Outputs: DOUT		To: DISP1.DIN1							Conn. No.:	220
	DOUT		DMOTOR.stop.do0								49
	Tasks:										
STOPTEST		0.5	sor								
	Inputs: INP1		From: PBBUTSTP.DOUT							Conn. No.:	247
	INP2		PBDNTM.DOUT								113
	INP3		ABORTPUL.DOUT								93
	Outputs: DOUT		To: DISP4.DIN1							Conn. No.:	104

TAGNAME	DESCRIPTION	SCAN	TIME	BLOCK TYPE	UNITS	HIGH RANGE	E RANG	LOW HIGH	LOW LIM.	ALM	ALM	DIG ALARM
	DOUT			PBENOR.INP1								232
	DOUT			PMOTOR.stop.d00								57
	DOUT			RSCHECKR.INP2								103
	DOUT			STOP2.INP2								215
	DOUT			TSTRUNNG.INP2								107
	DOUT			VALSET.INP2								108
	Tasks:											
	Inputs: INP1		0.1	sand								
	From: START.DOUT											
	Conn. No.:											7
	INP2			HILIMAND.QNOT								41
	INP3			LOLIMAND.QNOT								46
	INP4			DISMOVE.QNOT								12
	INP5			PSTOP.DOUT								131
	INP6			PRUN.QNOT								132
	Outputs: DOUT			To: STARTAND.INP1								45
	Tasks:											
	SWCABRT		0.5	SWCH	AMPS	225	0	225	0			
	Inputs: INP			From: DFLT1.OUT								
	Conn. No.:											464
	INP2			CURABRT.OUT								463
	SWCH			ANTON.DOUT								462
	Outputs: OUT			To: I2C1.A11								465
	Tasks:											
	SWCALRM		0.5	SWCH	AMPS	225	0	225	0			
	Inputs: INP			From: DFLT1.OUT								
	Conn. No.:											460
	INP2			CURALRM.OUT								173
	SWCH			ANTON.DOUT								461
	Outputs: OUT			To: I2C1.A14								171
	Tasks:											
	SWCSPDAB		0.5	SWCH	RPM	1200	0	1200	0			
	Inputs: INP			From: DFLT1.OUT								
	Conn. No.:											446
	INP2			PMPSPDAB.OUT								133
	SWCH			ANTON.DOUT								456
	Outputs: OUT			To: I2C1.A16								458
	Tasks:											
	SWCSPDAL		0.5	SWCH	RPM	1200	0	1200	0			
	Inputs: INP			From: DFLT1.OUT								
	Conn. No.:											447
	INP2			PMPSPDAL.OUT								135

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
SWCH	ANTON.DOUT										457
Outputs: OUT	To: I2C1.AI7										Conn. No.: 459
Tasks:											
TESTCHG		0.25	ALARM						1e+09	-1e+10	
Inputs: MEAS	From: UTESTNO.OUT										Conn. No.: 3e+02
SP	OLDTEST.OUT										3e+02
Outputs: DALM	To: TESTSET2.DIN1										Conn. No.: 3e+02
Tasks:											
TESTSET		0.5	REPORT								
Inputs: DIN1	From: SAVEPUL.DOUT										Conn. No.: 296
DIN2	DELPUL.DOUT										297
DIN3	CLRMESS.DOUT										106
Outputs: (None)											
Tasks:											
TESTSET2		0.5	REPORT								
Inputs: DIN1	From: TESTCHG.DALM										Conn. No.: 302
DIN2	NEXTPUL.DOUT										305
DIN3	PREVPUL.DOUT										306
DIN4	ON.DOUT										307
Outputs: (None)											
Tasks:											
TIR12A01	MIX PUMP MOTOR OIL TEMP 1	0.5	ANALOG INPUT	DEG F	383	32			0	0	
Inputs: EVAL	From: J1C0.AO4										Conn. No.: 144
Outputs: (None)											
Tasks:											
TIR12A02	MIX PUMP MOTOR OIL TEMP 2	0.5	ANALOG INPUT	DEG F	383	32			0	0	
Inputs: EVAL	From: J1C0.AO3										Conn. No.: 143
Outputs: (None)											
Tasks:											
TSTRUNNG		0.5	rs FLIP FLOP								
Inputs: INP1	From: PBSTRDN.DOUT										Conn. No.: 245
INP2	STOPTEST.DOUT										107
Outputs: DOUT	To: PBCALSEC.DIN1										Conn. No.: 370
DOUT	PBRAMP.RP1O										90
DOUT	PBSPLIT.DIN1										91
DOUT	RSECPB.RP1O										89
QNOT	NOPENAB.INP3										267

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	QNOT		NOPOPROB.INP1							315	
	QNOT		NOSEPROB.INP2							291	
	QNOT		PBCHKCLR.INP2							252	
	QNOT		PBENTIMO.INP2							327	
	QNOT		PBPOSAND.INP1							289	
	QNOT		PBSETAND.INP2							284	
	QNOT		PBSTRAND.INP4							156	
	QNOT		PSPROBA.INP2							368	
Display/Item:	MASFPUMP / BOX NORMAL	Param:	DOUT	Type:	COLOR ACTION	Pos:	[669,413]				
	MASFPUMP / BOX NORMAL		DOUT		COLOR ACTION		[680, 40]				
	PBENPROB / TEXT="TEST ALRE••" DOT		DOUT		SELECTION LIST		[100,600]				
	POSPROB / TEXT="TEST ALRE••" DOT		DOUT		SELECTION LIST		[80,740]				
	SETPROB / TEXT="TEST ALRE••" DOT		DOUT		SELECTION LIST		[80,660]				
Tasks:											
UACCEL	DESIRED PUMP ACCELERATION	30	ANALOG INPUT	RPM	500	0			0	0	
Inputs: (None)											
Outputs: OUT To: ACCELCHG.MEAS Conn. No.: 379											
R&R File:	ILOAD.RPS (line 14)	Line: @set(UACCEL.out,f1[i,30]:5)									
	NEXT.RPS (line 17)	@set(UACCEL.out,f1[i,30]:5)									
	NEXT.RPS (line 35)	@set(UACCEL.out,f1[i,30]:5)									
	PBSETVAL.RPS (line 53)	@SET(PMOTOR.ACCE,UACCEL.OUT) ; Set acceleration of pump motor.									
	PBSETVAL.RPS (line 56)	@SET(DO3DEV.SETP,UACCEL.OUT) ; Pump acceleration check for PBTESTS indication.									
	PREV.RPS (line 25)	@set(UACCEL.out,f1[i,30]:5)									
	SAVE.RPS (line 17)	@out(f2,"",UACCEL.out:3:1,"",UDECEL.out:3:1,"",URESTIM.out)									
	SAVE.RPS (line 25)	@out(f2,"",UACCEL.out:3:1,"",UDECEL.out:3:1,"",URESTIM.out)									
	SAVE.RPS (line 44)	@out(f2,"",UACCEL.out:3:1,"",UDECEL.out:3:1,"",URESTIM.out)									
	SAVE.RPS (line 60)	@out(f2,"",UACCEL.out:3:1,"",UDECEL.out:3:1,"",URESTIM.out)									
	SETOLD.RPS (line 6)	@SET(OACCEL.OUT,UACCEL.OUT)									
	ULOAD.RPS (line 14)	@set(UACCEL.out,f1[i,30]:5)									
Tasks:											
UANGLE	DIR MOTOR ANGLE FOR TEST SETU	30	ANALOG INPUT		360	0			0	0	
Inputs: (None)											
Outputs: OUT To: ANGLECHG.MEAS Conn. No.: 371											
R&R File:	ILOAD.RPS (line 9)	Line: @set(UANGLE.out,f1[i,5]:5)									
	NEXT.RPS (line 12)	@set(UANGLE.out,f1[i,5]:5)									
	NEXT.RPS (line 30)	@set(UANGLE.out,f1[i,5]:5)									
	PBSETVAL.RPS (line 63)	@SET(POSCNTRL.SETP,UANGLE.OUT) ; Set desired pump position.									

Genesis Strategy Data Dictionary

MAST FCM1, Version 1.01

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	PBSETVAL.RPS (line 68)		@SET(DO1DEV.SETP,UANGLE.OUT) ; Position check for PBTEST indication.								
	PREV.RPS (line 20)		@set(UANGLE.out,f1[i,5]:5)								
	SAVE.RPS (line 15)		@out(f2,UTESTNO.out:2:1,"",UANGLE.out:3:1,"",USPEED.out:4:1)								
	SAVE.RPS (line 23)		@out(f2,UTESTNO.out:2:1,"",UANGLE.out:3:1,"",USPEED.out:4:1)								
	SAVE.RPS (line 42)		@out(f2,UTESTNO.out:2:1,"",UANGLE.out:3:1,"",USPEED.out:4:1)								
	SAVE.RPS (line 58)		@out(f2,UTESTNO.out:2:1,"",UANGLE.out:3:1,"",USPEED.out:4:1)								
	SETOLD.RPS (line 1)		@SET(OANGLE.OUT,UANGLE.OUT)								
	ULOAD.RPS (line 9)		@set(UANGLE.out,f1[i,5]:5)								
Tasks:											
UDECEL	DESIRED PUMP DECELERATION	30	ANALOG INPUT	RPM	500	0			0	0	
Inputs: (None)											
Outputs: OUT											
R&R File: ILOAD.RPS (line 15)			To: DECELCHG.MEAS			Conn. No.: 381					
			Line: @set(UDECEL.out,f1[i,36]:5)								
NEXT.RPS (line 18)			@set(UDECEL.out,f1[i,36]:5)								
NEXT.RPS (line 36)			@set(UDECEL.out,f1[i,36]:5)								
PBSETVAL.RPS (line 54)			@SET(PMOTOR.DECE,UDECEL.OUT) ; Set deceleration of pump motor.								
PBSETVAL.RPS (line 57)			@SET(DO4DEV.SETP,UDECEL.OUT) ; Pump deceleration check for PBTESTS indication.								
PREV.RPS (line 26)			@set(UDECEL.out,f1[i,36]:5)								
SAVE.RPS (line 17)			@out(f2,"",UACCEL.out:3:1,"",UDECEL.out:3:1,"",URESTIM.out)								
SAVE.RPS (line 25)			@out(f2,"",UACCEL.out:3:1,"",UDECEL.out:3:1,"",URESTIM.out)								
SAVE.RPS (line 44)			@out(f2,"",UACCEL.out:3:1,"",UDECEL.out:3:1,"",URESTIM.out)								
SAVE.RPS (line 60)			@out(f2,"",UACCEL.out:3:1,"",UDECEL.out:3:1,"",URESTIM.out)								
SETOLD.RPS (line 7)			@SET(ODECEL.OUT,UDECEL.OUT)								
ULOAD.RPS (line 15)			@set(UDECEL.out,f1[i,36]:5)								
Tasks:											
UHRS	DESIRED TEST HOURS	30	ANALOG INPUT	HOURS	18	0			0	0	
Inputs: (None)											
Outputs: OUT											
R&R File: ILOAD.RPS (line 11)			To: HRSCHG.MEAS			Conn. No.: 375					
			Line: @set(UHRS.out,f1[i,19]:2)								
NEXT.RPS (line 14)			@set(UHRS.out,f1[i,19]:2)								
NEXT.RPS (line 32)			@set(UHRS.out,f1[i,19]:2)								
PBSETVAL.RPS (line 66)			@SET(PBHR.OUT,UHRS.OUT) ; Set desired hours for test operation.								
PREV.RPS (line 22)			@set(UHRS.out,f1[i,19]:2)								
SAVE.RPS (line 16)			@out(f2,"",UHRS.out:2:0,"",UMINS.out:2:0,"",USECS.out:2:0)								
SAVE.RPS (line 24)			@out(f2,"",UHRS.out:2:0,"",UMINS.out:2:0,"",USECS.out:2:0)								
SAVE.RPS (line 43)			@out(f2,"",UHRS.out:2:0,"",UMINS.out:2:0,"",USECS.out:2:0)								
SAVE.RPS (line 59)			@out(f2,"",UHRS.out:2:0,"",UMINS.out:2:0,"",USECS.out:2:0)								

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	SETOLD.RPS (line 3)		@SET(OHRS.OUT,UHRS.OUT)								
	ULOAD.RPS (line 11)		@set(UHRS.out,f1[i,19]:2)								
Tasks:											
UMINS	DESIRED TEST MINUTES	30	ANALOG INPUT	MINS.	59	0			0	0	
Inputs: (None)											
Outputs: OUT											
To: MINSCHG.MEAS Conn. No.: 390											
R&R File: ILOAD.RPS (line 12) Line: @set(UMINS.out,f1[i,23]:2)											
NEXT.RPS (line 15) @set(UMINS.out,f1[i,23]:2)											
NEXT.RPS (line 33) @set(UMINS.out,f1[i,23]:2)											
PBSETVAL.RPS (line 64) @SET(PBMIN.OUT,UMINS.OUT) ; Set desired minutes for pump operation.											
PREV.RPS (line 23) @set(UMINS.out,f1[i,23]:2)											
SAVE.RPS (line 16) @out(f2,"",UHRS.out:2:0,"",UMINS.out:2:0,"",USECS.out:2:0)											
SAVE.RPS (line 24) @out(f2,"",UHRS.out:2:0,"",UMINS.out:2:0,"",USECS.out:2:0)											
SAVE.RPS (line 43) @out(f2,"",UHRS.out:2:0,"",UMINS.out:2:0,"",USECS.out:2:0)											
SAVE.RPS (line 59) @out(f2,"",UHRS.out:2:0,"",UMINS.out:2:0,"",USECS.out:2:0)											
SETOLD.RPS (line 4) @SET(OMINS.OUT,UMINS.OUT)											
ULOAD.RPS (line 12) @set(UMINS.out,f1[i,23]:2)											
Tasks:											
UMSG1		0.5	ANALOG INPUT		0	0			0	0	
Inputs: (None)											
Outputs: (None)											
R&R File: CLRMESS.RPS (line 1) Line: @MSG(UMSG1.DESC,"")											
DELETE.RPS (line 3) @msg(umsg1.desc,"Checking...")											
DELETE.RPS (line 13) @msg(UMSG1.desc,"Deleting test.")											
DELETE.RPS (line 25) @msg(UMSG1.desc,"Test not found.")											
DELETE.RPS (line 39) @msg(UMSG1.desc,"Test not found.")											
DELETE.RPS (line 48) @msg(UMSG1.desc,"Test file not found.")											
SAVE.RPS (line 3) @msg(umsg1.desc,"Saving...")											
SAVE.RPS (line 13) @msg(UMSG1.desc,"Replacing previous test setup.")											
SAVE.RPS (line 69) @msg(umsg1.desc,"Save Complete.")											
Tasks:											
URESTIM	BIT TO RESET TEST ELAPSED TIME	30	DIGITAL INPUT								N
Inputs: (None)											
Outputs: DOUT											
To: RESCHG.INP1 Conn. No.: 383											
R&R File: ILOAD.RPS (line 16) Line: @set(URESTIM.out,f1[i,43]:1)											
NEXT.RPS (line 19) @set(URESTIM.out,f1[i,43]:1)											
NEXT.RPS (line 37) @set(URESTIM.out,f1[i,43]:1)											

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	PBSETVAL.RPS (line 59)		@IF(URESTIM.OUT == 1) ; Check if overall test time should be reset.								
	PREV.RPS (line 27)		@set(URESTIM.out,f1[,43]:1)								
	SAVE.RPS (line 17)		@out(f2,"",UACCEL.out:3:1,"",UDECEL.out:3:1,"",URESTIM.out)								
	SAVE.RPS (line 25)		@out(f2,"",UACCEL.out:3:1,"",UDECEL.out:3:1,"",URESTIM.out)								
	SAVE.RPS (line 44)		@out(f2,"",UACCEL.out:3:1,"",UDECEL.out:3:1,"",URESTIM.out)								
	SAVE.RPS (line 60)		@out(f2,"",UACCEL.out:3:1,"",UDECEL.out:3:1,"",URESTIM.out)								
	SETOLD.RPS (line 8)		@SET(ORESTIM.DOUT,URESTIM.DOUT)								
	ULOAD.RPS (line 16)		@set(URESTIM.out,f1[,43]:1)								
Tasks:											
USECS	DESIRED TEST TIME SECONDS	30	ANALOG INPUT	SECONDS	59	0			0	0	
Inputs: (None)											
Outputs: OUT			To: SECSCHG.MEAS						Conn. No.: 377		
R&R File: ILOAD.RPS (line 13)			Line: @set(USECS.out,f1[,27]:2)								
	NEXT.RPS (line 16)		@set(USECS.out,f1[,27]:2)								
	NEXT.RPS (line 34)		@set(USECS.out,f1[,27]:2)								
	PBSETVAL.RPS (line 65)		@SET(PBSEC.OUT,USECS.OUT) ; Set desired seconds for pump operation.								
	PREV.RPS (line 24)		@set(USECS.out,f1[,27]:2)								
	SAVE.RPS (line 16)		@out(f2,"",UHRS.out:2:0,"",UMINS.out:2:0,"",USECS.out:2:0)								
	SAVE.RPS (line 24)		@out(f2,"",UHRS.out:2:0,"",UMINS.out:2:0,"",USECS.out:2:0)								
	SAVE.RPS (line 43)		@out(f2,"",UHRS.out:2:0,"",UMINS.out:2:0,"",USECS.out:2:0)								
	SAVE.RPS (line 59)		@out(f2,"",UHRS.out:2:0,"",UMINS.out:2:0,"",USECS.out:2:0)								
	SETOLD.RPS (line 5)		@SET(USECS.OUT,USECS.OUT)								
	ULOAD.RPS (line 13)		@set(USECS.out,f1[,27]:2)								
Tasks:											
USPEED	PUMP SPEED FOR TEST SETUP	30	ANALOG INPUT	RPM	1200	0			0	0	
Inputs: (None)											
Outputs: OUT			To: SPEEDCHG.MEAS						Conn. No.: 373		
R&R File: ILOAD.RPS (line 10)			Line: @set(USPEED.out,f1[,11]:6)								
	NEXT.RPS (line 13)		@set(USPEED.out,f1[,11]:6)								
	NEXT.RPS (line 31)		@set(USPEED.out,f1[,11]:6)								
	PBSETVAL.RPS (line 69)		@SET(PMOTOR.MAXS,USPEED.OUT) ; Set pump motor maximum speed.								
	PBSETVAL.RPS (line 72)		@SET(PMOTOR.SPDS,USPEED.OUT) ; Set pump motor desired speed.								
	PBSETVAL.RPS (line 73)		@SET(PMPSPDAL.OUT,USPEED.OUT+10) ; Set pump motor alarm limit.								
	PBSETVAL.RPS (line 74)		@SET(PMPSPDAB.OUT,USPEED.OUT+20) ; Set pump motor abort limit.								
	PBSETVAL.RPS (line 76)		@SET(DO2DEV.SETP,USPEED.OUT) ; Desired speed check for PBTESTS indication.								
	PBSETVAL.RPS (line 77)		@SET(DO5DEV.SETP,USPEED.OUT) ; Pump maximum speed check for PBTESTS indication.								
	PBSETVAL.RPS (line 78)		@SET(DO6DEV.SETP,USPEED.OUT+10) ; Pump speed alarm check for PBTESTS indication.								

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
	PBSETVAL.RPS (line 79)		@SET(DO7DEV.SETP,USPEED.OUT+20) ; Pump speed abort check for PBTESTS indication.								
	PREV.RPS (line 21)		@set(USPEED.out,f1[i,11];6)								
	SAVE.RPS (line 15)		@out(f2,UATESTNO.out:2:1,"",UANGLE.out:3:1,"",USPEED.out:4:1)								
	SAVE.RPS (line 23)		@out(f2,UATESTNO.out:2:1,"",UANGLE.out:3:1,"",USPEED.out:4:1)								
	SAVE.RPS (line 42)		@out(f2,UATESTNO.out:2:1,"",UANGLE.out:3:1,"",USPEED.out:4:1)								
	SAVE.RPS (line 58)		@out(f2,UATESTNO.out:2:1,"",UANGLE.out:3:1,"",USPEED.out:4:1)								
	SETOLD.RPS (line 2)		@SET(OSPEED.OUT,USPEED.OUT)								
	ULOAD.RPS (line 10)		@set(USPEED.out,f1[i,11];6)								
Tasks:											
UATESTNO	TEST NUMBER FOR TEST SETUP	30	ANALOG INPUT		99.9	0			0	0	
Inputs: (None)											
Outputs: OUT		To: TESTCHG.MEAS						Conn. No.: 300			
R&R File: DELETE.RPS (line 12)		Line: @if(((testno-0.05) < UTESTNO.out) and ((testno+0.05) > UTESTNO.out))									
DELETE.RPS (line 23)		@if(UTESTNO.out < testno-0.05)									
ILOAD.RPS (line 2)		@set(OLDTEST.out,UTESTNO.out)									
ILOAD.RPS (line 8)		@set(UTESTNO.out,f1[i,0];4)									
NEXT.RPS (line 11)		@set(UTESTNO.out,testno)									
NEXT.RPS (line 29)		@set(UTESTNO.out,testno)									
PBSETVAL.RPS (line 86)		@SET(PBTESTNO.OUT,UTESTNO.OUT) ;Set current test number									
PREV.RPS (line 19)		@set(UTESTNO.out,testno)									
SAVE.RPS (line 12)		@if(((testno-0.05) < UTESTNO.out) and ((testno+0.05) > UTESTNO.out))									
SAVE.RPS (line 15)		@out(f2,UATESTNO.out:2:1,"",UANGLE.out:3:1,"",USPEED.out:4:1)									
SAVE.RPS (line 22)		@if(UTESTNO.out < testno-0.05)									
SAVE.RPS (line 23)		@out(f2,UATESTNO.out:2:1,"",UANGLE.out:3:1,"",USPEED.out:4:1)									
SAVE.RPS (line 42)		@out(f2,UATESTNO.out:2:1,"",UANGLE.out:3:1,"",USPEED.out:4:1)									
SAVE.RPS (line 58)		@out(f2,UATESTNO.out:2:1,"",UANGLE.out:3:1,"",USPEED.out:4:1)									
ULOAD.RPS (line 2)		@set(OLDTEST.out,UTESTNO.out)									
ULOAD.RPS (line 8)		@if(((testno-0.05) < UTESTNO.out) and ((testno+0.05) > UTESTNO.out))									
ULOAD.RPS (line 23)		@if(UTESTNO.out < testno-0.05)									
Tasks:											
V1.01		30	d FLIP FLOP								
Inputs: (None)											
Outputs: DOUT		To: V1.01.INP1						Conn. No.: 77			
Tasks:											
VALSET		0.5	rs FLIP FLOP								
Inputs: INP1		From: SETVALDN.DOUT						Conn. No.: 249			
INP2		STOPTEST.DOUT						108			

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Outputs:	DOUT		To: CHKCLR1.INP1							Conn. No.: 76	
	DOUT		NOPOPROB.INP3							317	
	DOUT		NOPSPROB.INP4							282	
	DOUT		PBDMPROB.INP2							425	
	DOUT		PBPOSAND.INP3							309	
	DOUT		PBSTRAND.INP5							157	
	DOUT		POSPROBA.INP4							361	
	DOUT		POSSET.INP1							140	
	QNOT		PBSETAND.INP5							352	
	QNOT		SETPROBA.INP3							357	
Display/Item:	MASFPUMP / BOX NORMAL	Param: DOUT			Type: COLOR ACTION				Pos: [680, 40]		
	PBENPROB / TEXT="TEST VALU**" DOT	QNOT			SELECTION LIST				[100,560]		
	POSPROB / TEXT="TEST VALU**" DOT	QNOT			SELECTION LIST				[80,660]		
	PSPROB / TEXT="TEST VALU**" DOT	QNOT			SELECTION LIST				[80,620]		
Tasks:											
VERSION	V1.01	0.5	AND								N
Inputs:	(None)										
Outputs:	DOUT		To: VERSION.INP1							Conn. No.: 178	
Display/Item:	CURDPRLM / PROCESS POINT	Param: DESC			Type: PROCESS POINT				Pos: [185,872]		
	MASFPOSM / PROCESS POINT	DESC			PROCESS POINT				[134,917]		
	MASFPUMP / PROCESS POINT	DESC			PROCESS POINT				[131,903]		
Tasks:											
VR050HAV	HIGH SPEED ALARM LIMIT	0.5	ANALOG INPUT	RPM	1200	0			0	0	
Inputs:	EVAL		From: I1C11.AO6							Conn. No.: 174	
Outputs:	OUT		To: DO6DEV.MEAS							Conn. No.: 230	
Display/Item:	MASFPUMP / PROCESS POINT	Param: OUT			Type: PROCESS POINT				Pos: [569, 72]		
Tasks:											
VR232020	PUMP MOTOR VOLTAGE	0.5	ANALOG INPUT	VOLTS	460	0			0	0	
Inputs:	EVAL		From: PMOTOR.MOTORV.inp							Conn. No.: 186	
Outputs:	OUT		To: I2C1.AI8							Conn. No.: 152	
Display/Item:	MASFPUMP / PROCESS POINT	Param: OUT			Type: PROCESS POINT				Pos: [650,652]		
Tasks:											
VR232030	PUMP MOTOR FREQUENCY	0.5	ANALOG INPUT	HZ	66	1			0	0	
Inputs:	EVAL		From: PMOTOR.FREQ.inp							Conn. No.: 187	
Outputs:	(None)										
Tasks:											
VR232040	PUMP MOTOR CURRENT	0.5	ANALOG INPUT	AMPS	225	0			E	-1	

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Inputs: HALM		From: CURALRM.OUT						Conn. No.: 166			
Outputs: OUT		To: I2C2.AI4						Conn. No.: 154			
Display/Item: MASFPUMP / PROCESS POINT		Param: OUT		Type: PROCESS POINT				Pos: [650,683]			
Tasks:											
VR232050	PUMP MOTOR SPEED	0.5	ANALOG INPUT	RPM	1200	0			1190	-1	
Inputs: EVAL		From: PMOTOR.SPEED.inp						Conn. No.: 189			
Outputs: OUT		To: EQUPSPD.INP2						Conn. No.: 114			
OUT		I2C2.AI5						153			
Display/Item: MASFPUMP / FILLED BOX NORMAL		Param: OUT		Type: SIZE ACTION				Pos: [891,186]			
MASFPUMP / PROCESS POINT		OUT		PROCESS POINT				[248,783]			
Tasks:											
VR232060	PUMP MOTOR SETPOINT SPEED	0.5	ANALOG INPUT	RPM	1200	0			0	0	
Inputs: EVAL		From: PMOTOR.SPDSET.inp						Conn. No.: 190			
Outputs: OUT		To: DO2DEV.MEAS						Conn. No.: 226			
OUT		EQUPSPD.INP						115			
Display/Item: MASFPUMP / FILLED BOX NORMAL		Param: OUT		Type: SIZE ACTION				Pos: [928,186]			
Tasks:											
VR232070	ROTATION MOTOR % LOAD	0.5	ANALOG INPUT	%LOAD	100	0			0	0	
Inputs: EVAL		From: DMOTOR.LOAD.inp						Conn. No.: 61			
Outputs: (None)											
Tasks:											
VR232080	ROTATION MOTOR VOLTAGE	0.5	ANALOG INPUT	VOLTS	460	0			0	0	
Inputs: EVAL		From: DMOTOR.MOTORV.inp						Conn. No.: 62			
Outputs: OUT		To: I2C2.AI1						Conn. No.: 175			
Display/Item: MASFPOSM / PROCESS POINT		Param: OUT		Type: PROCESS POINT				Pos: [689,562]			
Tasks:											
VR232090	ROTATION MOTOR FREQUENCY	0.5	ANALOG INPUT	HZ	66	1			0	0	
Inputs: EVAL		From: DMOTOR.FREQ.inp						Conn. No.: 63			
Outputs: (None)											
Tasks:											
VR232100	ROTATION MOTOR CURRENT	0.5	ANALOG INPUT	AMPS	20	0			0	0	
Inputs: EVAL		From: DMOTOR.MOTORA.inp						Conn. No.: 64			
Outputs: OUT		To: I2C2.AI2						Conn. No.: 176			
Display/Item: MASFPOSM / PROCESS POINT		Param: OUT		Type: PROCESS POINT				Pos: [689,607]			
Tasks:											
VR232110	ROTATION MOTOR SPEED	0.5	ANALOG INPUT	RPM	1200	0			0	0	
Inputs: EVAL		From: DMOTOR.SPEED.inp						Conn. No.: 66			

TAGNAME	DESCRIPTION	SCAN TIME	BLOCK TYPE	UNITS	HIGH RANGE	LOW RANG E	HIGH LIM.	LOW LIM.	HIGH ALM	LOW ALM	DIG ALARM
Outputs: OUT		To: I2C2.AI3						Conn. No.: 177			
Display/Item: MASFPOS / PROCESS POINT		Param: OUT		Type: PROCESS POINT				Pos: [240, 38]			
Tasks:											
VR232120	ROTATION MOTOR SETPOINT SPEE	0.5	ANALOG INPUT	RPM	1200	0			0	0	
Inputs: EVAL		From: DMOTOR.SPDSET.inp						Conn. No.: 67			
Outputs: (None)											
Tasks:											
VSDRS232	PUMP VSD % LOAD	0.5	ANALOG INPUT	%LOAD	150	0			0	0	
Inputs: EVAL		From: PMOTOR.LOAD.inp						Conn. No.: 185			
Outputs: (None)											
Tasks:											
WATCHDOG		6	not								
Inputs: (None)											
Outputs: DOUT		To: ST8WDRES.INP						Conn. No.: 210			
DOUT		WATCHDOG.INP1						79			
Tasks:											
ZIMPE143	CW POSITION LIMIT	0.5	DIGITAL INPUT								Y
Inputs: EVAL		From: J2C0.DO16						Conn. No.: 146			
Outputs: (None)											
Display/Item: MASFPOS / CIRCLE RAD=15		Param: DOUT		Type: COLOR ACTION				Pos: [945,181]			
Tasks:											
ZIMPE144	CCW POSITION LIMIT	0.5	DIGITAL INPUT								Y
Inputs: EVAL		From: J2C0.DO15						Conn. No.: 147			
Outputs: (None)											
Display/Item: MASFPOS / CIRCLE RAD=15		Param: DOUT		Type: COLOR ACTION				Pos: [945,109]			
Tasks:											

	CURDPRLM	DMPROB	MASFMENU	MASFPISM	MASFPUMP	PBENPROB	POSPROB	PSPROB	SETPROB							
Sorted by Tagname	CLRMES	DELETE	ILOAD	NEXT	PBSETVAL	PREV	SAVE	SETOLD	ULOAD							
TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
A5ABRT				N	N	N										104
Inputs:																
Outputs:																
Tasks:																
ABORT	N	1		E	Y	N	N			ABORT	OK					85
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
ABORTOR	N	0								ABORT	OK					84
Inputs:																
Outputs:																
Tasks:																
ABORTPUL										ABORT						99
Inputs:																
Outputs:																
Tasks:																
ACCELCHG	N	0														129

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Inputs:																
Outputs:																
Tasks:																
AF5COMFA	N	1		E	Y	N	N									259
Inputs:																
Outputs:																
Tasks:																
ANGLECHG	N	0														124
Inputs:																
Outputs:																
Tasks:																
ANTON																277
Inputs:																
Outputs:																
Tasks:																
BACKWARD																18
Inputs:																
Outputs:																
Tasks:																
BENAB																6
Inputs:																
Outputs:																
Tasks:																
BUMPENAB	N	0		E	Y	N	N									12
Inputs:																
Outputs:																
Tasks:																
R&R File:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Tasks:																
BUTPULSE																43
Inputs:																
Outputs:																
Tasks:																
CALCURR																169
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
CALDISPR																182
Inputs:																
Outputs:																
Tasks:																
CHANGED																143
Inputs:																
Outputs:																
R&R File:																
Tasks:																
CHGCHK1																133
Inputs:																
Outputs:																
Tasks:																
CHKANDPO																203
Inputs:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Outputs:																
Tasks:																
CHKCLR1																33
Inputs:																
Outputs:																
Tasks:																
CHKCLRTN																200
Inputs:																
Outputs:																
Tasks:																
CHKCOLOR																144
Inputs:																
Outputs:																
Tasks:																
CLRMESS																305
Inputs:																
Outputs:																
R&R File:																
Tasks:																
COMMOR																221
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
CURABRT	N	0	E		Y	N	N					0	0			185
Inputs:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Outputs:																
Display/Item:																
Tasks:																
CURALRM	N	0	E		Y	N	N					0	0			183
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
CURPRED	N	0	E		Y	N	N					0	0			184
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
DACCEL	N	0	E		Y	N	N					0	0			57
Inputs:																
Outputs:																
Tasks:																
DATSPEED	N	0		E	Y	N	N			YES	NO					167
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
DDECEL	N	0	E		Y	N	N					0	0			83
Inputs:																
Outputs:																
Tasks:																
DDISP																162
Inputs:																
Outputs:																
Tasks:																
DECELCHG	N	0														130
Inputs:																
Outputs:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Tasks:																
DELPUL																304
Inputs:																
Outputs:																
Tasks:																
DEV 3																
Inputs:																
Outputs:																
Tasks:																
DEV 4																
Inputs:																
Outputs:																
Tasks:																
DF262799	N	0	0		N	Y	N					0	0			63
Inputs:																
Outputs:																
Tasks:																
DFAULT	N	0		E	Y	N	N			FAULT	OK					136
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
DFLT0	N	0	0		N	Y	N					0	0			201
Inputs:																
Outputs:																
Tasks:																
DFLT1	N	0	0		N	Y	N					0	0			67
Inputs:																
Outputs:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Tasks:																
DFORWARD	N	0		E	Y	N	N			YES	NO					137
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
DISMOV																47
Inputs:																
Outputs:																
Tasks:																
DISMOV1																164
Inputs:																
Outputs:																
Tasks:																
DISMOVE	N	0		N	N	Y	N			DISABLED	ENABLED					7
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
DISP1																109
Inputs:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Outputs:																
Tasks:																
DISP2																26
Inputs:																
Outputs:																
Tasks:																
DISP3																271
Inputs:																
Outputs:																
Tasks:																
DISP4																13
Inputs:																
Outputs:																
Tasks:																
DISPRABT	N	0	E		Y	N	N					0	0			188
Inputs:																
Outputs:																
Tasks:																
DISPRALM	N	0	E		Y	N	N					0	0			187
Inputs:																
Outputs:																
Tasks:																
DISPRPRE	N	0	E		Y	N	N					0	0			186
Inputs:																
Outputs:																
Tasks:																
DLINEV	N	0	E		Y	N	N					0	0			88
Inputs:																

[illegible]

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Display/Item:																
R&R File:																
Tasks:																
DMPROB																153
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
DMPROBDI																171
Inputs:																
Outputs:																
Tasks:																
DMPROBR																157
Inputs:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Outputs:																
Tasks:																
DO1-6DEV																237
Inputs:																
Outputs:																
Tasks:																
DO1-7DEV																238
Inputs:																
Outputs:																
Tasks:																
DO1DEV	N	0														252
Inputs:																
Outputs:																
Display/Item:																
R&R File:																
Tasks:																
DO2DEV	N	0														254
Inputs:																
Outputs:																
Display/Item:																
R&R File:																
Tasks:																
DO3DEV	N	0														255
Inputs:																
Outputs:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Display/Item:																
R&R File:																
Tasks:																
DO4DEV	N	0														210
Inputs:																
Outputs:																
Display/Item:																
R&R File:																
Tasks:																
DO5DEV	N	0														211
Inputs:																
Outputs:																
Display/Item:																
R&R File:																
Tasks:																
DO6DEV	N	0														233
Inputs:																
Outputs:																
Display/Item:																
R&R File:																
Tasks:																
DO7DEV	N	0														234
Inputs:																
Outputs:																
Display/Item:																
R&R File:																
Tasks:																
DREADY	N	0		E	Y	N	N			YES	NO					61
Inputs:																
Outputs:																
Display/Item:																
Tasks:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL	OUT	FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI	INST. LOW	RAW RNG	RAW LOW	BLK. ID
DREVENAB	N	0	E		Y	N	N				YES	NO					168
Inputs:																	
Outputs:																	
Display/Item:																	
Tasks:																	
DREVERSE	N	0	E		Y	N	N				YES	NO					138
Inputs:																	
Outputs:																	
Display/Item:																	
Tasks:																	
DRUN	N	0	E		Y	N	N				YES	NO					134
Inputs:																	
Outputs:																	
Display/Item:																	
Tasks:																	
DSTOP	N	0	E		Y	N	N				YES	NO					135
Inputs:																	
Outputs:																	
Display/Item:																	
Tasks:																	
ENABBUMP																	5
Inputs:																	
Outputs:																	
Tasks:																	
ENCHECK	N	0	E		Y	N	N				ENABLE	DISABLE					253
Inputs:																	

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Outputs:																
Tasks:																
ENMOV PUL																166
Inputs:																
Outputs:																
Tasks:																
ENMOV TON																161
Inputs:																
Outputs:																
Tasks:																
EQU SPD																142
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
FOR OVER																31
Inputs:																
Outputs:																
Tasks:																
FORWARD																16
Inputs:																
Outputs:																
Tasks:																
FOVR STOP																32
Inputs:																
Outputs:																
Tasks:																
FSTR TDEL																3
Inputs:																
Outputs:																
Tasks:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL.	TRK	MAN	SCN	FUL OUT	FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI	INST. LOW	RAW	LOW	BLK.	ID
GOFORWRD																	8
Inputs:																	
Outputs:																	
GOREVERS																	10
Tasks:																	
Inputs:																	
Outputs:																	
GOSTOP																	14
Inputs:																	
Outputs:																	
Tasks:																	
HILIMAND																	44
Inputs:																	
Outputs:																	
Tasks:																	
HILIMIT																	4
Inputs:																	
Outputs:																	
Tasks:																	
Display/Item:																	
Outputs:																	
Inputs:																	
HOLDENMO																	181
Inputs:																	
Outputs:																	
Tasks:																	
HPSPDLM	N	0	E		Y	N	N					0	0				76
Inputs:																	
Outputs:																	
Tasks:																	

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TAGNAME	INH. ALARM	PRI. VAL.	ENT. VAL.	ENT. BIT	TRK	MAN	SCN	FUL OUT	FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI	INST. LOW	RAW LOW	RAW BLK.
Outputs:																
Tasks:																
12C2							N								0	94
Inputs:																
INBAND	N	0	E	Y	N	N	N									52
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
INFILE	N	0	N	N	N	Y	N									313
Inputs:																
Outputs:																
R&R File:																
Tasks:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
INPOSI																30
Inputs:																
Outputs:																
Tasks:																
J1C0	N	0	0		N	N	N					0	0			87
Inputs:																
Outputs:																
Tasks:																
J2C0	NNNNNNNN NNNNNNNN	0		NNNNNNNN NNNNNNNN	N	N	N									89
Inputs:																
Outputs:																
Tasks:																
J2C1	NNNNNNNN NNNNNNNN	0		NNNNNNNN NNNNNNNN	N	N	N									90
Inputs:																
Outputs:																
Tasks:																
J2C2	NNNNNNNN NNNNNNNN	0		NNNNNNNN NNNNNNNN	N	N	N									91
Inputs:																
Outputs:																
Tasks:																
LOLIMAND																46
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
LOLIMIT																11

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Inputs:																
Outputs:																
Tasks:																
MANUAL	N	0		N	N	Y	N									146
Inputs:																
Outputs:																
R&R File:																
Tasks:																
MAXINDX	N	0	0		N	Y	N					0	0			315
Inputs:																
Outputs:																
R&R File:																
Tasks:																
MINSCHG	N	0														127
Inputs:																
Outputs:																
Tasks:																
MIP00001	N	0		E	Y	N	N			PROBLEM	OK					227
Inputs:																
Outputs:																
Tasks:																
NEXTINDX	N	0	0		N	Y	N					0	0			314

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Inputs:																
Outputs:																
R&R File:																
Tasks:																
NEXTPUL																312
Inputs:																
Outputs:																
Tasks:																
NODEFAIL	N	1		E		Y	N	N								263
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
NODMPROB																165
Inputs:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL.	ENT. BIT	TRK	MAN	SCN	FUL OUT	FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI	INST. LOW	RAW	RAW LOW	BLK. ID
	Outputs:																
	Tasks:																
	NOPENAB																
274	Inputs:																
	Outputs:																
	Tasks:																
	NOPOPJOB																
319	Inputs:																
	Outputs:																
	Tasks:																
	NOPSPRO2																
110	Inputs:																
	Outputs:																
	Tasks:																
	NOPSPROB																
270	Inputs:																
	Outputs:																
	Tasks:																
	NORUN																
49	Inputs:																

[illegible]

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
ODECEL	N	0	0		N	Y	N					0	0			123
Inputs:																
Outputs:																
R&R File:																
Tasks:																
OHR5	N	0	0		N	Y	N					0	0			115
Inputs:																
Outputs:																
R&R File:																
Tasks:																
OLDTEST	N	0	0		N	Y	N					0	0			308
Inputs:																
Outputs:																
R&R File:																
Tasks:																
OMINS	N	0	0		N	Y	N					0	0			116
Inputs:																
Outputs:																
R&R File:																
Tasks:																
ON	N	0		Y	Y	N	N									9
Inputs:																
Outputs:																
Tasks:																
ORESTIM	N	0		N	N	Y	N									117
Inputs:																
Outputs:																
R&R File:																
Tasks:																
OSECS	N	0	0		N	Y	N					0	0			120
Inputs:																
Outputs:																
R&R File:																
Tasks:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
OSPEED	N	0	0		N	Y	N					0	0			114
Inputs:																
Outputs:																
R&R File:																
Tasks:																
PACCEL	N	0	E		Y	N	N					0	0			80
Inputs:																
Outputs:																
Tasks:																
PATSPEED	N	0		E	Y	N	N			YES	NO					178
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
PB30SEC	N	1														72
Inputs:																
Outputs:																
Tasks:																
PBBUTSTP																118
Inputs:																
Outputs:																
Tasks:																
PBCALSEC																151
Inputs:																
Outputs:																
Tasks:																
PBCHK1	N	0														276
Inputs:																

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TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Display/Item:																
Tasks:																
PBENADIS																273
Inputs:																
Outputs:																
Tasks:																
PBENAND																267
Inputs:																
Outputs:																
Tasks:																
PBENOR																265
Inputs:																
Outputs:																
Tasks:																
PBENREST																97
Inputs:																
Outputs:																
Tasks:																
PBENRSRS																62
Inputs:																
Outputs:																
Display/Item:																
Tasks:																

[illegible]

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Tasks:																
PBPOSPMP																95
Inputs:																
Outputs:																
Tasks:																
PBPROB	N	0								PROBLEM						275
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
PBPROB2																172
Inputs:																
Outputs:																
Tasks:																
PBRAMP	N	0														15
Inputs:																
Outputs:																
Tasks:																
PBRAMPHL																54
Inputs:																
Outputs:																
Tasks:																
PBREPORT																58

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Inputs:																
Outputs:																
R&R File:																
Tasks:																
PBSEC	N	0	0		N	Y	N					0	0			107
Inputs:																
Outputs:																
Display/Item:																
R&R File:																
Tasks:																
PBSETAND																147
Inputs:																
Outputs:																
R&R File:																
Tasks:																
PBSPLIT																152
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
PBSTRAN2																27
Inputs:																
Outputs:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Tasks:																
PBSTRAND																150
Inputs:																
Outputs:																
Tasks:																
PBSTRTDN	N	0		E	Y	N	N									257
Inputs:																
Outputs:																
Tasks:																
PBSTTEST																96
Inputs:																
Outputs:																
Tasks:																
PBTESTNO	N	0	0		N	Y	N					0	0			37
Inputs:																
Outputs:																
R&R File:																
Tasks:																
PDECEL	N	0	E		Y	N	N					0	0			81
Inputs:																
Outputs:																
Tasks:																
PDISP																272
Inputs:																
Outputs:																
Tasks:																
PENAB																51

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Inputs:																
Outputs:																
Tasks:																
PENABA																111
Inputs:																
Outputs:																
Tasks:																
PENABOR																55
Inputs:																
Outputs:																
Tasks:																
PENABR																56
Inputs:																
Outputs:																
Tasks:																
PFAULT	N	0		E	Y	N	N			YES	NO					176
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
PFORWARD	N	0		E	Y	N	N			YES	NO					179
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
PLCAMPAB	N	0	E		Y	N	N					0	0			106
Inputs:																
Outputs:																
Tasks:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
PLCAMPAL	N	0	E		Y	N	N					0	0			108
Inputs:																
Outputs:																
Tasks:																
PLCCURAB	N	0	E		Y	N	N					0	0			190
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
PLCCURAL	N	0	E		Y	N	N					0	0			189
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
PLCDPRAB	N	0	E		Y	N	N					0	0			192
Inputs:																
Outputs:																
Tasks:																
PLCDPRAL	N	0	E		Y	N	N					0	0			191
Inputs:																
Outputs:																
Tasks:																
PLCFAIL	N	1		E	Y	N	N			FAILURE	OK					24
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
PLCFAIL2	N	0								FAILURE	OK					196
Inputs:																
Outputs:																
Tasks:																
PLCPBENA	N	0		E	Y	N	N			ENABLE	DISABLE					78
Inputs:																

[illegible]

[illegible]

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Tasks:																
PMPSPDAB	N	0	E		Y	N	N					0	0			140
Inputs:																
Outputs:																
R&R File:																
Tasks:																
PMPSPDAL	N	0	E		Y	N	N					0	0			139
Inputs:																
Outputs:																
R&R File:																
Tasks:																
POSCNTRL	N	0				N										2
Inputs:																
Outputs:																
Display/Item:																
R&R File:																
Tasks:																
POSDISP																318
Inputs:																
Outputs:																
Tasks:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
POSITION	E	9	E		Y	N	N					0	0			1
Inputs:																
Outputs:																
Display/Item:																
R&R File:																
Tasks:																
POSORBUM																202
Inputs:																
Outputs:																
Tasks:																
POSPROB																42
Inputs:																
Outputs:																
Tasks:																
POSPROBA																102
Inputs:																

TAGNAME	INH. ALARM	PRI.	VAL.	ENT.	ENT. BIT	TRK	MAN	SCN	FUL	OUT	FBK	DISPLAY	HIGH	LOW	NAME	INST.	HI	LOW	RAW	RAW	BLK.	ID
POSROBR																						
Outputs:																						
Tasks:																						
Inputs:																						
POSET	N																					29
Outputs:																						
Tasks:																						
Inputs:																						
PREADY	N																					173
Outputs:																						
Tasks:																						
Inputs:																						
PREVENAB	N																					180
Outputs:																						
Tasks:																						
Inputs:																						
PREVERSE	N																					177
Outputs:																						
Tasks:																						
Inputs:																						
Display/Item:																						
Outputs:																						
Tasks:																						
Inputs:																						
PREVUL																						311
Outputs:																						
Tasks:																						
Inputs:																						
PRUN	N																					174
Outputs:																						
Tasks:																						
Inputs:																						

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Outputs:																
Display/Item:																
Tasks:																
PSDISP																209
Inputs:																
Outputs:																
Tasks:																
PSPROB																65
Inputs:																
Outputs:																
Tasks:																
PSPROBA																112
Inputs:																
Outputs:																
Tasks:																
PSPROBR																68
Inputs:																
Outputs:																
Tasks:																
PSTOP	N	0		E		Y	N	N		YES	NO					175
Inputs:																
Outputs:																

[illegible]

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
ROVRSTOP																35
Inputs:																
Outputs:																
Tasks:																
RPENAB																60
Inputs:																
Outputs:																
Tasks:																
RPOSPROB																50
Inputs:																
Outputs:																
Tasks:																
RPSPROB																69
Inputs:																
Outputs:																
Tasks:																
RSCHECK																235
Inputs:																
Outputs:																
Tasks:																
RSCHECKR																236
Inputs:																
Outputs:																
Tasks:																
RSECPB	N	0														160
Inputs:																
Outputs:																
Tasks:																
RSETPROB																41
Inputs:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Outputs:																
Tasks:																
RSTRTDEL																20
Inputs:																
Outputs:																
Tasks:																
SAVEPUL																303
Inputs:																
Outputs:																
Tasks:																
SECSCHG	N	0														128
Inputs:																
Outputs:																
Tasks:																
SEDISP																280
Inputs:																
Outputs:																
Tasks:																
SETPROB																36
Inputs:																
Outputs:																
Tasks:																
SETPROBA																86
Inputs:																
Outputs:																
Tasks:																
SETPROBR																40
Inputs:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Outputs:																
Tasks:																
SETTEST																38
Inputs:																
Outputs:																
Tasks:																
SETVALDN	N	0		N	N	Y	N									248
Inputs:																
Outputs:																
Tasks:																
R&R File:																
Tasks:																
SPDABOFF																64
Inputs:																
Outputs:																
Tasks:																
SPDALOFF																66
Inputs:																
Outputs:																
Tasks:																
SPEEDCHG	N	0														125
Inputs:																
Outputs:																
Tasks:																
SPLITPB																159
Inputs:																
Outputs:																
Tasks:																
ST8WDRES				N	N	N										92

TAGNAME	INH. ALARM	PRI. VAL	ENT. VAL	TRK	MAN	SCN	FUL OUT	DISPLAY	HIGH NAME	LOW NAME	INST. HI	INST. LOW	RAW LOW	RAW BLK.	ID
	Inputs:														
	Outputs:														
	Tasks:														
START	Inputs:														21
	Outputs:														
	Tasks:														
STARTAND	Inputs:														100
	Outputs:														
	Tasks:														
STARTSHT	Inputs:														77
	Outputs:														
	Tasks:														
STOP	Inputs:														28
	Outputs:														
	Tasks:														
STOP2	Inputs:														101
	Outputs:														
	Tasks:														
STOPTEST	Inputs:														148
	Outputs:														
	Tasks:														
	Inputs:														
	Outputs:														
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	Outputs:														

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Tasks:																
STRTAND																45
Inputs:																
Outputs:																
Tasks:																
SWCABRT																205
Inputs:																
Outputs:																
Tasks:																
SWCALRM																204
Inputs:																
Outputs:																
Tasks:																
SWCSPDAB																198
Inputs:																
Outputs:																
Tasks:																
SWCSPDAL																199
Inputs:																

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Printed 9/23/94

TAGNAME	INH. ALARM	PRI.	VAL.	ENT.	ENT. BIT	TRK	MAN	SCN	FUL	OUT	FBK	DISPLAY	HIGH	LOW	NAME	INST.	HI	LOW	RAW	LOW	BLK.	ID
USSECS	N	0	0			N	Y	N								0	0					299
Tasks:																						
Inputs:																						
Outputs:																						
R&R File:																						
USPEED	N	0	0			N	Y	N								0	0					284
Tasks:																						
Inputs:																						
Outputs:																						
R&R File:																						

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Tasks:																
UTESTNO	N	0	0		N	Y	N					0	0			282
Inputs:																
Outputs:																
R&R File:																
Tasks:																
V1.01																98
Inputs:																
Outputs:																
Tasks:																
VALSET																149
Inputs:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Outputs:																
Display/Item:																
Tasks:																
VERSION	N	0														25
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
VR050HAV	N	0	E		Y	N	N					0	0			261
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
VR232020	N	0	E		Y	N	N					0	0			285
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
VR232030	N	0	E		Y	N	N					0	0			286
Inputs:																
Outputs:																
Tasks:																
VR232040	N	1	E		Y	N	N					0	0			287

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
VR232050	N	1	E		Y	N	N					0	0			288
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
VR232060	N	0	E		Y	N	N					0	0			289
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
VR232070	N	0	E		Y	N	N					0	0			290
Inputs:																
Outputs:																
Tasks:																
VR232080	N	0	E		Y	N	N					0	0			291
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
VR232090	N	0	E		Y	N	N					0	0			292
Inputs:																
Outputs:																
Tasks:																
VR232100	N	0	E		Y	N	N					0	0			293
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
VR232110	N	0	E		Y	N	N					0	0			294
Inputs:																

TAGNAME	INH. ALARM	PRI.	ENT. VAL	ENT. BIT	TRK	MAN	FUL SCN	OUT FBK	DISPLAY	HIGH NAME	LOW NAME	INST. HI RNG	INST. LOW RNG	RAW RNG	RAW LOW RNG	BLK. ID
Outputs:																
Display/Item:																
Tasks:																
VR232120	N	0	E		Y	N	N					0	0			295
Inputs:																
Outputs:																
Tasks:																
VSDRS232	N	0	E		Y	N	N					0	0			103
Inputs:																
Outputs:																
Tasks:																
WATCHDOG																262
Inputs:																
Outputs:																
Tasks:																
ZIMPE143	N	0	E		Y	N	N			LIMIT	OK					132
Inputs:																
Outputs:																
Display/Item:																
Tasks:																
ZIMPE144	N	0	E		Y	N	N			LIMIT	OK					141
Inputs:																
Outputs:																
Display/Item:																
Tasks:																

DISTRIBUTION SHEET

To DISTRIBUTION	From SPECIAL PROJECTS	Page 1 of 1 Date 09/26/94 EDT No. 602290 ECN No.
Project Title/Work Order COMPUTER SYSTEM DESIGN DESCRIPTION FOR THE SPARE PUMP MINI-DACS DATA ACQUISITION AND CONTROL SYSTEM		

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
K. F. Armatis	N1-27	X			
R. E. Bauer	L6-37	X			
G. T. Bear	R1-51	X			
T. R. Benegas	N1-27	X			
A. K. Brewer	N2-05	X			
S. A. Brisbin	L6-37	X			
C. E. Hanson	H5-09	X			
L. S. Krogsrud	R3-08	X			
D. C. Larson	R1-51	X			
J. W. Lentsch	S7-15	X			
M. L. McElroy	S1-57	X			
S. O. Smith	L6-37	X			
R. W. Truitt	L6-37	X			
G. F. Vargo, Jr.	H5-09	X			
J. R. Vincent	N2-23	X			
ASTI (2 Copies)	L8-04	X			
Project Files	H5-09	X			
H Hoida (LANL)	K5-55	X			
L Trujillo (LANL)	K5-55	X			
<i>Central Files (2)</i>	<i>L8-04</i>	<i>X</i>			

SEP 29 1994

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 602290

2. To: (Receiving Organization) DISTRIBUTION		3. From: (Originating Organization) SPECIAL PROJECTS		4. Related EDT No.: N/A	
5. Proj./Prog./Dept./Div.: 101-SY HYDROGEN MITIGATION		6. Cog. Engr.: G.F. VARGO, JR.		7. Purchase Order No.: N/A	
8. Originator Remarks: THIS DOCUMENT IS BEING TRANSMITTED FOR APPROVAL.				9. Equip./Component No.: N/A	
				10. System/Bldg./Facility: TANK 241-SY-101	
11. Receiver Remarks:				12. Major Assm. Dwg. No.: N/A	
				13. Permit/Permit Application No.: N/A	
				14. Required Response Date: ASAP	

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	WHC-SD-WM-CSDD-014		0	COMPUTER SYSTEM DESIGN DESCRIPTION FOR THE SPARE PUMP MINI-DACS DATA ACQUISITION AND CONTROL SYSTEM	Q,S	4		

16. KEY									
Approval Designator (F)		Reason for Transmittal (G)				Disposition (H) & (I)			
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)		1. Approval 2. Release 3. Information		4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)		1. Approved 2. Approved w/comment 3. Disapproved w/comment		4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged	
(G)	(H)	17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)						(G)	(H)
Reason	Dis p.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN
4	1	Cog.Eng. G.F. VARGO	<i>G.F. Vargo</i>	9/26/94	H5-09	K.F. ARMATIS	<i>K.F. Armatis</i>	9/28/94	H1-27
4	1	Cog. Mgr. C.E. HANSON	<i>C.E. Hanson</i>	9/27/94	H5-09				
4	1	QA M.L. MCELROY	<i>M.L. McElroy</i>	9/29/94	S1-57				
4	1	Safety L.S. KROGSRUD	<i>L.S. Krogsrud</i>	9/28/94	R3-08				
4	1	R.W. TRUITT	<i>R.W. Truitt</i>	9/28/94	L6-37				
4	1	S.O. SMITH	<i>S.O. Smith</i>	9/28/94	L6-37				

18. <i>G.F. Vargo</i> 9/26/94 Signature of EDT Originator Date		19. <i>C.E. Hanson</i> 9/27/94 Authorized Representative Date for Receiving Organization		20. <i>C.E. Hanson</i> 9/27/94 Cognizant Manager Date		21. DOE APPROVAL (if required) Ctrl. No. N/A ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments	
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