TECHNICAL NOTES

INTRODUCTION

This section of the System Administration Manual contains essays or documents that pertain to the operation and use of the Management Analysis Program software. Most of the documents included here were originally published as Release Notes or excerpts from the System Studies newsletter's Tech Tips or Tech Jargon articles. Further information on operations is included in the MAP System help menus.

ENSURE CORRECT READINGS FOR PIPE SOURCE PRESSURE TRANSDUCERS

Are you getting correct pressure readings for your "SP" type transducers in PressureMAP? If you're not, it’s important to check the **PSI** field in PressureMAP. The **PSI** field is used to indicate whether or not a pressure offset needs to be added to the reading for source pressure transducers.

Here's how it works. There are two types of source pressure transducers; a normal pressure transducer (PTD) that produces readings in the 0-9.5 psi range, and a high pressure transducer (HPTD), that produces readings in the 4.5-15.0 psi range. Both transducer types should be designated as "SP" types in PressureMAP when they monitor delivery pressure at the pipe alarm, B-meter (distribution) panel, or pole mounted compressors. If a "HPTD" transducer has been installed at the one of these locations, a pressure offset **MAY** need to be added to the **PSI** data entry field.

A problem occurs because not all CPAMS software supports the higher pressure readings of a "HPTD". The CPAMS software will read the high pressure devices (HPTD), but only in the 0-9.5 psi range. If you enter a pressure offset of "5.0" in the **PSI** field, PressureMAP will add 5.0 psi to whatever pressure reading the CPAMS unit supplies. In this way, PressureMAP makes up for any software deficiency your CPAMS may have in terms of a high pressure device type (HPTD). If the **PSI** field entry is "0.0", PressureMAP assumes that the proper reading has been supplied by the CPAMS—PressureMAP records and analyzes this reading without modification.

In order for everything to function properly, there must be an entry in PressureMAP's **PSI** field. If the actual pressure for the device is in the 0-9.5 psi range, make sure that the **PSI** field has an entry of 0.0. If this field is left blank, it is possible that you'll get an incorrect reading for the device, and possibly erroneous dispatches. A valid entry in the **PSI** field for "SP" devices will help ensure the quality of your PressureMAP system.

ANALYZING INCOMPLETE SYSTEM INDEXES

For today's cable pressurization managers, the System Quality Index (SQI) is the most advanced and accurate way to evaluate a cable pressurization system. Based on air flow per sheath mile of cable and average cable pressures, the SQI rates the protection capabilities of the system.

PressureMAP provides an SQI for each route in an office by computing both pressure and flow readings. Two components are necessary for providing accurate SQIs: first, there must be at least one pressure monitoring device and one flow monitoring device on the route, and second, an OAU (Optimum Air Usage) total must be given for each flow monitoring device.

Included in the system index are the sheath mileage totals for the various routes. If a route does not meet the requirements for indexing, it will be listed in the index, and will display a sheath mileage total only when a flow device is on the route. A total office index is derived from the combination of route indexes, with each route being weighted according to its total sheath mileage.

The SQI can be used in a number of different ways: analyzing a route, prioritizing dispatches, and determining if a route is a valid candidate for re-engineering. Because of these reasons, obtaining a daily SQI is an important element of cable pressurization management. However, there are situations when an office will display an incomplete, or missing index.

When an incomplete index appears, your first response may be to pull the "Device History of the Entire Office" file. Although this file lists the devices, device types, and readings, it **does not** show which devices are on the same route. Because SQIs are determined by routes, the "Device history by pipe route" option allows you to see all the devices on a particular route.

The examples on the following page show the device history of four routes. With the exception of the CO route, they all include a reason for an incomplete index.

The CO route includes both flow and pressure devices and includes valid daily readings. It includes all the necessary factors for determining an SQI.

The Pipe A route also includes both flow and pressure devices. However, the readings for "2" (day before yesterday) are missing.

Readings can be missing due to a number of reasons: trouble on the pair, a device is busy, or PressureMAP cannot read the CPAMS (Sparton, Chatlos, etc.). A missing reading is a primary reason for an incomplete index for the route.

The Pipe B route contains pressure devices, however, it does not have a flow device. Once again, both a pressure and flow device, along with an OAU total for the flow device are needed to obtain an SQI.

The Pipe C route has both pressure and flow devices. The flow devices all contain a valid daily reading, but the end pipe pressure device on the route does not. A SQI cannot be calculated.

```
Device History of EXAMPLE, Pipe CO                        PressureMAP XX.XX.XX
04/10/2006  07:07                                   System Studies Incorporated
-------------------------------------------------------------------------------

        .READING...........SETTLED READINGS....................AVERAGES....

Device # TP   Curr Last Tdy   -1   -2   -3   -4   -5   -6  WK-1 WK-2 WK-3 WK-4
-------- --   ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ----
T-041    UP    9.4  9.4  9.4  9.4  9.4  9.4  9.4  9.5  9.5  9.4  9.4  9.4  9.4
T-042    UP    6.9  6.9  6.9  6.9  6.9  6.5  6.8  6.8  6.7  6.7  6.7  6.9  6.9
T-043    UP    8.9  8.9  8.9  8.9  8.9  8.9  8.8  8.8  8.8  8.8  8.8  8.8  8.8
T-044    UP    8.9  8.9  8.9  8.9  8.9  8.8  8.9  8.8  8.8  8.8  8.8  8.9  8.8
T-095    DF    6.6  6.6  6.6  6.6  6.6  6.9  6.5  6.5  6.8  6.6  6.8  6.8  6.9


Device History of EXAMPLE, Pipe A                         PressureMAP XX.XX.XX
01/02/2004  07:07                                   System Studies Incorporated
-------------------------------------------------------------------------------

       .READING...........SETTLED READINGS.....................AVERAGES....

Device # TP   Curr Last Tdy   -1   -2   -3   -4   -5   -6  WK-1 WK-2 WK-3 WK-4
-------- --   ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ----
T-016    UP    8.0  8.0  8.0  8.0       8.0  8.0  8.1  8.0  8.0  8.1  8.0  8.1
T-017    UP    9.4  9.4  9.4  9.4       9.5  9.5  9.5  9.5  9.5  9.5  9.5  9.5
T-036    MF    4.6  4.6  4.6  4.6       4.6  4.6  4.6  4.6  4.9  4.6  4.6  4.8
T-091    DF   16.0 16.0 16.3 14.8      16.5 16.2 15.8 16.0 16.1 16.0 16.0 16.2


Device History of EXAMPLE, Pipe B                            PressureMAP  X.XX
01/02/2004  07:07                                   System Studies Incorporated
-------------------------------------------------------------------------------

       .READING...........SETTLED READINGS.....................AVERAGES....

Device # TP   Curr Last Tdy   -1   -2   -3   -4   -5   -6  WK-1 WK-2 WK-3 WK-4
-------- --   ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ----
T-051    UP    8.4  8.4  8.4  8.4  8.4  8.4  8.4  8.4  8.4  8.4  8.5  8.5  8.4
T-056    UP    8.4  8.4  8.4  8.4  8.4  8.9  8.9  8.9  8.9  8.9  8.9  8.9  8.9
T-057    UP    6.9  6.9  6.9  6.9  6.9  7.4  7.4  7.4  7.5  7.4  7.4  7.4  7.4


Device History of EXAMPLE, Pipe C                            PressureMAP  X.XX
01/02/2004  07:07                                   System Studies Incorporated
-------------------------------------------------------------------------------

       .READING...........SETTLED READINGS.....................AVERAGES....

Device # TP Curr Last Tdy   -1   -2   -3   -4   -5   -6  WK-1 WK-2 WK-3 WK-4
-------- -- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ----
T-051    MF  9.8        9.8  9.8  9.8  13.5 13.4 13.5 13.6 13.4 13.4 13.5 13.4
T-056    MF  7.5  7.5  7.6  7.5  7.6   7.8  7.8  7.8  7.8  7.7  7.5  7.7  7.7
T-057    MF  6.8        6.4  6.4  5.8   7.2  7.2  7.2  7.0  7.0  7.0  7.1  7.0
T-107    EP BUSY  ERR BUSY BUSY BUSY  BUSY BUSY BUSY BUSY BUSY  7.9  7.9 BUSY
```

REPORT 7-1: DEVICE HISTORY REPORT

When examining the total office SQI, you can see it is affected by the absence of an SQI for the Pipe C route. The sheath mileage for Pipe C is included in the calculation of the office SQI, even though an SQI is not available for the Pipe C route. Therefore, the office SQI is slanted by the lack of an SQI for Pipe C. Even though the CO route has a "Today" reading of "91" and the Pipe A route reads "94", the office "Today" reading is only "69". This may be 20 to 25 index points lower than the true index rating.

If an incomplete SQI occurs for a particular route in your office, it is important to look at the causes discussed in this article before a final analysis of the office is completed. PressureMAP's files contain worthwhile and helpful information. When used correctly, PressureMAP can help you determine the cause for an incomplete SQI.

HOW ARE DYNAMIC DISPATCHES DETERMINED?

As manager of the technical support department for System Studies, I'm reminded daily how challenging my job and the jobs of other tech support people are. Not only do we help the customer with his or her most difficult software and hardware problems, but we must also answer some complex questions about the Management Analysis Program (MAP) software.

One question that we hear frequently is, "How do you determine your Dispatch Priorities?" This is a challenging question because our Dispatch Priorities are developed with a very complex algorithm that has evolved over a number of years. This algorithm, while based on common sense, is not something you can completely explain over a coffee break. In fact, it is not likely that we can explain it fully in this article. But, we'll try our best.

To start with, it's important to state that all MAP software dispatches fall under one of two types: dynamic or static. By definition, dynamic means a state of change, while static means a stable condition (not changing). When used in association with dispatches, the definitions of these terms are not altered. A dynamic dispatch is a problem that has occurred recently over a relatively short period of time, one that is still possibly changing. A static dispatch is a pre-existing problem that has not recently changed (i.e. a transducer that has been below standard for weeks). Both dynamic and static dispatches are topics in themselves. However, in this article we're going to concentrate on the criteria that determines dynamic dispatches.

To begin our discussion we need to ask how one dynamic dispatch compares to another. The MAP software groups dynamic dispatches according to two attributes: severity and ranking. The severity of a dispatch is denoted by "stars." A dynamic dispatch can have a 2, 3, or 4 star severity, with a 4 star (****) dispatch being the most severe. (There are also routine and 1 star dispatches, but these are static conditions and will be discussed in Part 2 of this article.) The ranking of a dispatch is determined by the severity of the dispatch and by the type of device that is being affected. For example, a 4 star dispatch is always ranked higher than a 3 star, and a device monitoring air dryer output is ranked higher than a device monitoring aerial cable pressure.

So, how are ranking and severity determined? The MAP software determines ranking and severity by asking the following questions: 1) how much does a given problem affect the total system, 2) how much has the device reading changed, and 3) how long did it take for the change to occur?

How Does a Given Problem Affect the Total System?
To answer this question, you need to know what type of device is being affected. For instance, a contact alarm (MAP type "CA") is recognized industrywide as being a top priority. There is good reason for this. If a dryer goes down, all the cables in your system may be affected. Because of the severity of this type of alarm it's not surprising that "CA" devices rank as System Studies' highest priority. Moving down the line, source flow (SF), source pressure (SP), and pipe end point pressure (EP) transducers are ranked just below a contact alarm. It makes sense that if an air pipe (the main source of air) is being affected, there is great potential danger to the whole route. Next in line is the manifold flow transducer (MF). A high flow at an air pipe manifold can affect all the cables in the manifold's sphere of influence. And last, but not least, underground (UP), buried (BP), and aerial (AP) cable pressure transducers are ranked in the order of their minimum pressure standards.

Please note that these devices are not all the transducer types monitored and used in developing Dispatch Priorities. They are mentioned because they best illustrate how rank and severity are given.

How Much Has A Condition Changed?

The second question of "how much" affects not only the ranking, but also the severity of the dispatch. The ranking is affected in the following way: if there are two dispatches on devices of similar type, the device with the most dramatic change is ranked higher. The rationale for this is simple: fix the biggest problem first. But what about severity? Obviously, if a contactor comes into alarm, you've got a major problem. But what about pressure and flow devices? How much of a change constitutes a problem?

Type	24-hour ****	48-hour ***	72-hour **
CA	ALARM	-	-
SF	10 SCFH	-	-
MF	3 SCFH	3 SCFH	3 SCFH
EP	1 PSI	1 PSI	1 PSI
SP	1 PSI	1 PSI	1 PSI
UP	3 PSI	3 PSI	3 PSI
BP	3 PSI	3 PSI	3 PSI

TABLE 7-1: DISPATCH PRIORITIES

After years of research and consulting with numerous experts in the telecommunications industry, System Studies has formulated and implemented some time-proven standards. We use the criteria shown in TABLE 7-1 to determine the severity of a pressure or flow situation. It is generally accepted that if a device change meets or exceeds the criteria shown in a short period of time (24 to 72 hours), there may a serious problem in the field. It's important to keep in mind that when developing Dispatch Priorities, these changes are used only in conjunction with the next question: How long did it take to change?

How Long Did it Take for the Change to Happen?

The answer to this question is the final ingredient used in assigning rank and severity to a dispatch. While this is probably the most straightforward of the three questions, it is an invaluable part of the process. As with the other two ingredients in the recipe, the question of "how long" is based on common sense. The most dramatic change over the shortest period of time is the most severe and highest ranked dispatch. The MAP software looks for dynamic changes over 24 hour periods that meet the criteria outlined in question 2. (How much has the condition changed?) If a device change meets the criteria within a 24- hour period, the MAP software generates a 4 star alarm (****). If the conditions are met in a 48-hour period, the dispatch is a 3 star. Finally, if the conditions are met over a 72-hour period, the dispatch is a 2 star. By putting the answers to questions 2 and 3 together and using the priority ranking from question 1, Table 7-2 is constructed.

If you refer to this table, you can see how the MAP software develops its Dispatch Priorities. First, it looks at the type of device (what it monitors in the system). It then analyzes the degree of change (the greater the change, the more cause there is for alarm). Finally, it considers the duration of the change (the faster the change, the more likely it is that damage could occur).

Device Type	PMAP Type	SCFH/PSI	Increase/Drop
Source Flow	SF:	10 SCFH	Increase
Manifold Flow	MF:	3 SCFH	Increase
End Point Pressure	EP:	1 PSI	Drop
Source Pressure	SP:	1 PSI	Drop
Undergrd. Pressure	UP:	3 PSI	Drop
Buried Pressure	BP:	3 PSI	Drop
Aerial Pressure	AP:	3 PSI	Drop/maximum

TABLE 7-2: DISPATCH CRITERIA

We hope this discussion has helped answer some of your questions regarding dynamic dispatches. In our next Gazette, we'll explain the determinations involved in developing static dispatches.

HOW ARE STATIC DISPATCHES DETERMINED?

In the last Gazette (# 30) we answered the question of how the MAP software develops Dispatch Priorities. In that discussion, we defined the two types of dispatches: dynamic and static. You may recall that dynamic dispatches are created by a condition that changes over a relatively short period of time, and static dispatches are generated by a pre-existing condition. Previously, we discussed dynamic dispatches. In this issue, we'll concentrate on how the MAP software determines static dispatches.

Static dispatches denote conditions (high flow or low pressure) which don't qualify as dynamic dispatches (a four, three, or two star dispatch), but do pose a threat to your cable pressurization system. For example, an underground pressure transducer which has been reading 3 PSI below standard for three weeks—and has not gone wet—doesn't deserve as much attention as an underground pressure transducer which has dropped 4 PSI in 24 hours. Still, any transducer below standard is a threat to the system. A transducer not meeting the standards you set during data entry will always be considered a static dispatch.

Static dispatches are ranked and prioritized to help you identify serious threats to your system. They have a lower ranking than dynamic dispatches and are identified in terms of severity by using a one star (*) and routine (R) designation. Remember that dynamic dispatches have a four star (****), three star (***), and two star (**) severity. Typically, routine dispatches include high air flow conditions and low aerial transducer readings. One star dispatches usually consist of low pressure conditions or transducers which have had some type of reading problem for 48 hours or more. The criteria for ranking and determining the severity of static dispatches is similar to the standards involved with generating dynamic dispatches. The principles are based on sending the technician to the biggest problem first in order to produce the greatest impact on the overall system.

The MAP software accomplishes this prioritizing process by answering three basic questions:

1) Where is the problem and how does it affect the system?
2) How easy is it to find the problem?
3) How does one problem compare to another?

Where is the Problem and How Does it Affect the System?

The MAP software directs you to work in the area that will have the greatest effect on your cable pressurization system. One place you can dramatically impact the system is at the air source. In static dispatching, the pipe pressures feeding the manifolds are recognized as a very important priority. So important, in fact, the MAP software ranks a low pipe pressure higher than any other static dispatch. Why is the pipe pressure so important? It makes sense that if an air source is only supplying 5 PSI to the cables, the highest pressure you will see on that particular cable route is 5 PSI. Usually the cable pressure is lower than the pipe pressure. Therefore, a low pipe pressure can jeopardize your whole route. Because raising your pipe pressure can improve conditions on the entire route, the MAP software will list this static dispatch first rather than listing any devices with low readings along the route.

Ranked just below a low pipe pressure condition is a low cable pressure condition. Of all the pressure transducers monitoring cables, underground transducers (UP) are ranked as the highest priority. A cable in the underground is more susceptible to damage than a buried (BP) or aerial (AP) transducer because of its location in the manhole.

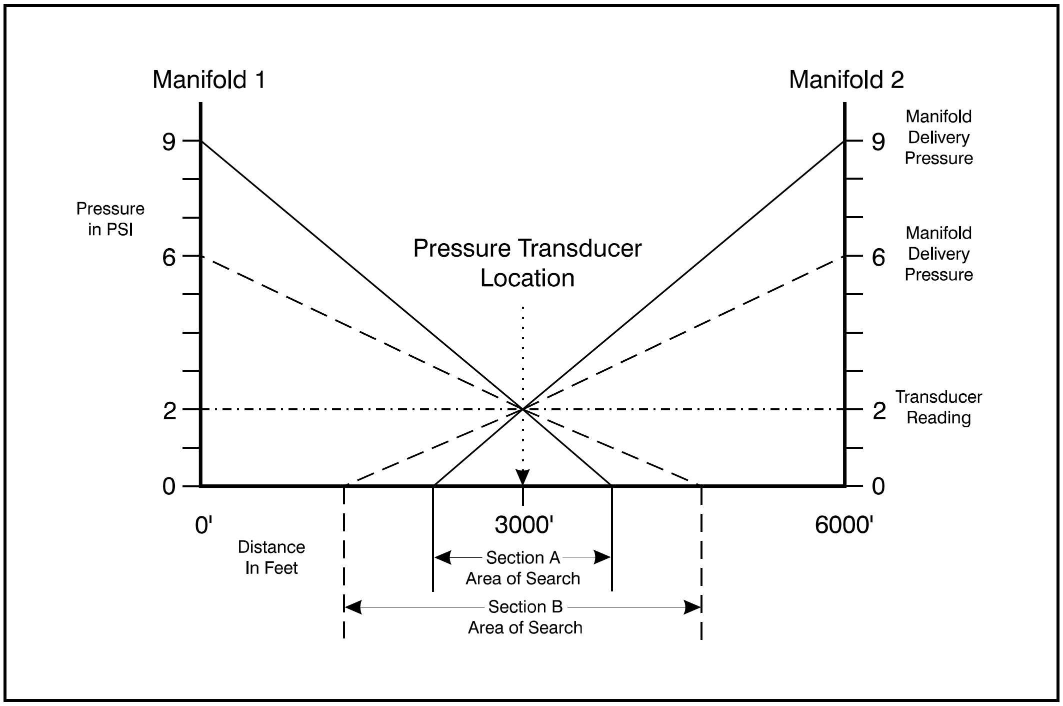

FIGURE 7-1: DETERMINING AREA OF SEARCH

How Fast can the Technician Find the Leak?

When creating static dispatches for transducers on the cable, the MAP software will direct the technician to find the easiest leak first by looking at pipe delivery pressure and determining the smallest area of search. This point is illustrated in FIGURE 7-1.

Please note the vertical line on the graph represents pressure while the horizontal line marks the distance between the locations. Two different dual feed sections of cable are shown, and for purposes of this illustration, we'll call one Section "A" (indicated by a solid vertical line) and the other Section "B" (indicated by a vertical broken line). Each cable is fed by different pipes with different delivery pressures, and both sections are 6000 feet between manifolds. Each has a midpoint pressure transducer reading of 2 PSI. Section "A" has a pipe pressure of 9 PSI and Section "B" has a pipe pressure of 6 PSI. The MAP software will send you to Section "A" first. Why? Because Section "A" has the greatest pressure drop per foot, and **the area of search is smaller than the area of search in section "B"**. For this reason, the MAP software ranks the 2 PSI on Section "A" higher than the 2 PSI reading on Section "B". Therefore, the technician is sent to the section with the highest delivery pressure.

How does the Problem Compare to Similar Dispatches?
Once the first two questions are answered, the MAP software must further differentiate between static dispatches by deciding the seriousness of one condition compared to another.

For instance, if two underground pressure transducers are below standard and both have the same delivery pressure, which one is ranked first? The transducer with the lowest reading will be ranked higher than the other one, because it represents a more serious condition.

TABLE 7-3 lists some of the static dispatches with their appropriate rankings. By referring to this table, you can see how the important static dispatches are determined and ranked. As discussed in this article, the device type, device reading, and pipe reading are all factors in determining the severity of a static dispatch.

Device Type	Device Reading	Pipe Reading/Duration	Severity
SP, EP	3 PSI or less	N/A	*
SP, EP	5 PSI or less	N/A	*
UP	2 PSI or less	7 or more	*
BP	1 PSI or less	N/A	*
UP	2 PSI or less	5 or more	*
UP	4 PSI or less	5 or more	*
BP	below standard	5 or more	*
AP	1 PSI or less	5 or more	*
AP	1 PSI or less	unmonitored	R
MF	300% over OAU	N/A	R
MF	200% over OAU	N/A	R
MF	150% over OAU	N/A	R

TABLE 7-3: STATIC DISPATCHES

We hope this discussion has answered any questions you may have regarding the manner in which the MAP software determines static dispatches.

HIGH PRIORITY DEVICE TYPES

In previous Tech Jargon articles (Gazettes 30 and 31), we explained the criteria that Management Analysis Program (MAP) software uses for determining dynamic and static dispatches. We explained that the priority given a particular condition is directly related to the type of device. For example, if a dryer has gone down, the contact alarm (MAP type "CA") which is monitoring the dryer will have a higher priority than the underground pressure transducer (MAP type "UP") that has dropped 3 PSI. Because the device types determine the Dispatch Priorities, it's important to enter the correct device type during data entry.

When you're running AlarmMAP, data entry becomes even more critical. This particular MAP software monitors devices 24 hours a day. When a 4 star (****) alarm is detected, it notifies the appropriate Alarm Center of the condition. If a device is coded incorrectly (the wrong device type has been entered), AlarmMAP may not recognize a critical condition. For example, take an underground pressure transducer that has been incorrectly entered as an aerial pressure transducer (MAP type "AP"). Normally, a "UP" type transducer will generate a 4 star alarm if it drops 3 PSI or more in 24 hours.

Although an aerial cable is important, it never warrants a 4 star alarm. Therefore, if a "UP" type device is mislabeled as an "AP" type device, a severe pressure drop could go unnoticed. And missing a severe condition on an underground cable could result in a lost cable. Therefore, we recommend that you double-check each of your entries before you enter a new one. This will help prevent potential costly errors.

High Priority Devices

The latest version of multi-user MAP software includes a new group of device type codes that gives users the ability to specify "high priority" devices. A high priority device type designates tighter alarming, higher standards, and the manner in which dispatch priorities are developed. When specifying a high priority device, users are assured that a particular device will have the highest priority of dispatches in its class.

Devices that monitor important or high risk cables are good examples of high priority devices. For example, a major cable supplying service to a critical area, or a cable in a deep manhole subject to high water pressures may need higher standards or tighter alarming than normal transducers.

In order to cause a dynamic four star (****) alarm for a underground pressure transducer, the pressure drop may need to be 1 PSI instead of 3 PSI. Or the minimum pressure standard for a pressure device may need to be 1 or 2 PSI higher than the office standard. By designating important devices as high priority device types, users are given the ability to modify the normal pressure and flow standards.

```
HIGH PRIORITY ($) DEVICE MAP CODES

$P High Priority Pressure Device
$F High Priority Flow Device
$V High Priority Volume Counter
$C High Priority Pressure Contactor
$A High Priority Contact Alarm
```

TABLE 7-4: HIGH PRIORITY DEVICE CODES

When entering a pressure or flow device as a high priority device during data entry, two new fields are included in the "Specific Device Information" screen.

For a high priority pressure device ($P), a Standard (**STD**) and Change (**Chng**) field are included. The **STD** field represents the minimum pressure standard you designate for this particular device only. It controls Static Dispatches. The **Chng** field is used to adjust the degree of change (drop in pressure) that is needed for a dynamic dispatch to be generated. It controls Dynamic Dispatches.

For instance, if you want a dynamic dispatch on a "$P" device to be generated when a 1 PSI drop occurs, you would enter a "1" into the **Chng** field. If you want the standard for this device to be 6 PSI, you would enter "6" into the **STD** field. The "STD" for this device (normally 5 PSI) - is automatically set to 6 PSI. Both fields have default values. The **Chng** field defaults to 1.5 PSI. The **STD** field defaults to 1 PSI higher than the office standard for an underground pressure transducer. You may adjust each field to the level required, or accept the default settings.

Two new fields are also included in the Specific Device Information screen when a high priority flow device ($F) is entered into the MAP software. The Standard Air Usage (**SAU**) field replaces the Optimum Air Usage (**OAU**) field and a Change (**Chng**) field is included. The principles behind these fields are similar to the new fields for high priority pressure devices. They also affect the generation of Static and

Dynamic Dispatches. The **SAU** field represents the standard "OAU" for this particular "$F" device only. And the **Chng** field represents the degree of change (increase in flow) needed to generate a dynamic dispatch.

High priority device types provide a valuable option for customizing your monitoring system. Using these types of devices in strategic places protects the system's quality and efficiency.

THE PROPER PROCEDURE FOR SHUTTING DOWN A MULTI-USER SYSTEM

Shutting down the Management Analysis Program (MAP) software on a MAP Engine (UNIX) computer is a critical function of the proper operation of the system. When the single-user (DOS) MAP software was commonplace, shutting down the system was as easy as turning off the computer. While this was not the preferred way of "powering down", it rarely caused a system crash. However, with the multi-user MAP software, shutting down the system with the power-switch can have catastrophic consequences. It can cause a system crash and make it necessary to completely rebuild the system (a task that can take several hours). To save the time and aggravation of rebuilding your system, it's important that you learn to shut down the system properly.

Anytime you need to power-off or reboot your computer, you need to shut down the system. Typically, you will need to shut down your system to reset and reinitialize the hardware, or when you receive a software update from System Studies. However, other situations occur which make it necessary to shut down the computer.

For instance, sometimes a session may "hang", meaning that you are stuck somewhere in a program and can't get a response from the software. To remedy this situation, the machine needs to be shut down and the system reset. The methods available to complete this procedure are discussed in the following paragraphs.

The Routine Shutdown

Performing a routine shutdown is the preferred way to turn off the system. There are two ways to perform this, and both are found in the System Administration Menu. They are "Shut down the computer" (option #4) and "Shut down and reboot the computer" (option #5). The first option issued when you want to power off the MAP computer. Choosing this option will shut down the MAP system and indicate to you when it's safe to turn off the power. The second option is used when you want to reboot the computer without turning off the power. Choosing this option will not only shut down the computer, but automatically reboot the computer after the system is down. If the MAP system needs to be shut down, either of these routine shutdown procedures should be used whenever possible.

Turning off the power without shutting down the system is always the last resort.

The Alternate Console

When your system console (the screen and the keyboard that is actually connected to the MAP computer) is hung in a program, performing a routine shutdown becomes a little more difficult. However, it is still possible. The trick is to find a different way to log into the system to access the System Administration Menu (where the appropriate shutdown options appear). One method for achieving this is to access the system by using a remote printer or terminal to dial into the system. If the system is responding to the user access ports, you can log in normally and access the System Administration Menu. If the ports are not responding (not answering or issuing a login prompt), logging in on an alternate console should be attempted.

Before explaining what an alternate console is and how it works, it's necessary to describe the term "session". A user session is created or started each time someone logs into the system. The term "alternate consoles" or "alternate screens" is appropriate because it's possible to have more than one user session running from a system console at the same time. By using special key strokes on the keyboard, you are able to switch back and forth from one session to the other. The keys entered while viewing a given session affect only the selected session and have no effect on the others. In all, there are four alternate consoles that can be used when logging in. To switch from one console to the other, you hold down the "Alt" key on the keyboard and press one of the function keys: F1, F2, F3, or F4. The first console (evoked by the keystroke Alt-F1) is the "main console" for the system. This is where all the system diagnostic messages are printed. The second, third and fourth consoles (evoked by Alt-F2, Alt-F3, and Alt-F4 respectively) are designated as alternate consoles. If your session is locked-up on the main console and you need to shut down the system, don't just power-off the computer! Instead, try accessing the system through an alternate console. If you can log in through an alternate console, then you can access the System Administration Menu and perform a routine shutdown.

The Last Resort

If your system is completely without life--you couldn't access it through a remote terminal, or through an alternate console--then and only then, should you turn off the power.

CLEARING RULES BASED ON ONE STEP

If PressureMAP detects sufficient improvement in a pressure or flow condition that triggered an alarm or dispatch, the program will remove or "clear" the report from the list of current dispatches. Just as there are rules for generating dispatches, there are also rules for clearing them. This article explains what PressureMAP is "thinking" when it decides to clear an outstanding dispatch.

First of all, there are two types of dispatches, dynamic and static. Dynamic dispatches are based on change that occurs over a period of time; static dispatches are not based on a change, just a condition. Here are examples of the two different types of dispatches:

Dynamic:

- Flow increased 14 SCFH in under 24 hrs.
- Underground Cable PSI dropped 3.0 PSI in 24 hrs.

Static:

- Flow is over 300% of OAU.
- Buried PSI TD at 0.5 PSI.

The Concept

The general idea for clearing a dynamic dispatch is that when the current reading is within a certain tolerance of the last good settled reading, the outstanding dispatch should be cleared. For example, if a flow device increases and continues to do so, it will eventually generate a dispatch. Theoretically, this condition is caused by a leak, so once the leak is fixed, the flow should begin to drop again. When the flow has dropped to within a certain tolerance, PressureMAP assumes that the cable or cables affected by the flow increase are no longer in danger of going wet. It then clears the outstanding dispatch.

The tolerance mentioned above relates to the concept of "one step". This tolerance, or one comprised of multiple steps, is used to clear a dispatch. The actual value of one step depends on device type and, for flow devices, the range of the flow device. The general rule of thumb is to divide the reading range of the device by 19. Below are some examples:

0-9.5 Pressure TD: 9.5 / 19 = 0.5 PSI is one step

0-19.0 Flow TD: 19.0 / 19 = 1.0 SCFH is one step

0-47.5 Flow TD: 47.5 / 19 = 2.5 SCFH is one step

0-95.0 Flow TD: 95.0 / 19 = 5.0 SCFH is one step

The Process

The actual procedure for clearing a dispatch is a bit more complicated. It depends on the device type, flow range (where applicable), and entries in the PressureMAP data files. If the user has changed anything during data entry, a flag is set which causes PressureMAP to clear and reevaluate the device's condition.

The comparison reading varies based on which PressureMAP routine is being run. Dispatch Priorities will compare the today reading (Tdy) against the last 3 days: -1, -2 and -3. Dispatch Alarms will compare the current reading (Curr) against Tdy, -1, -2 and -3.

If the reading is BUSY, BLANK, NA or EDIT, the dispatch is not cleared. These are considered uninformative readings, so no decision can be made. If the device reading is verbose (such as OPEN or SHRT) and differs from the comparison reading, then the dispatch is cleared and a new dispatch may be generated based on the new reading. If the reading comes back within a certain tolerance of what the original "good" reading was, the dispatch is cleared. This is where the concept of a single or multiple step comes in.

- Pressure devices: a dispatch will be cleared if the reading comes within 1 step (0.5 PSI) of the original reading.
  Exception:
  High priority devices have a **`Change`** field that is used. This is a user-defined value. Steps are not used for these types of devices.

- Flow, volume and compressor transducers:
  *F, all flow transducers:
  - If the reading drops to 0 SCFH, a dispatch is generated. To clear this dispatch, any change from 0 SCFH is required.
  - In cases where there is not a drop to 0 SCFH, the dispatch is cleared if the device comes within 2 steps of the original "good" reading.

  Exception:
  $F, high priority flow transducers: the clearing rule is based on the user defined **`Change`** field.

- ALL other device types (contactor and contact alarm devices): the one step concept does not apply. These devices are either on/off (OK or in ALRM).

For suggestions on handling repeat offenders in generating dispatches, see Tech Jargon ("The Alarming World of Wolfers") in Gazette #52. This article can also be accessed online in the AirTalk website (*www.airtalk.com/ tj-wolf.htm*).

PressureMAP Data Entry
In air pipe systems, the **`Delivery std`** field on PressureMAP's Office Information Screen refers to the desired delivery pressure at the end of the air pipe. Typically, with 10 PSI as the pipe panel source pressure, you should enter 7.5 PSI (the default setting in PressureMAP) for the delivery standard value.

We're finding that there is some confusion over what this field represents, and that some people have been entering "Delivery std" pressures of 10 PSI instead of 7.5 PSI. This creates an artificially high standard, which lowers the SQI that PressureMAP calculates. It can also cause the system to generate "low pressure" dispatches for conditions that are not really a problem. Making sure that this data is accurate will keep your office's index from getting dinged unfairly. And it could make life a little bit easier for the people handling dispatch priorities.