AWIPS SYSTEM MODIFICATION NOTE 13 (for Electronic Systems Analysts)
Maintenance Logistics & Acquisition Division
W/OPS1: FJZ

SUBJECT : PX Retrofit Procedure for AS2 Rack Installed 1650 PXs

PURPOSE : To provide 2650 PX replacement procedures for sites with 1650 PXs.

AUTHORIZATION : The authority for this patch modification note is Request for Change AA320

EQUIPMENT AFFECTED : Advanced Weather Interactive Processing System (AWIPS) at sites listed in attachment A.

SITES AFFECTED : See attachment A.

PARTS REQUIRED : Northrop Grumman Information Technology, Inc (NGIT) will ship all required parts to the sites. Sites will receive 2 boxes.

MODIFICATION PROCUREMENT : None

TOOLS REQUIRED : Standard site tool kit, spare monitor, keyboard, and mouse.

TEST EQUIPMENT REQUIRED : None

EFFECT ON OTHER: INSTRUCTIONS AWIPS System Modification Note 4 and 5. File this note in EHB-13, Series II, section 5.1.

VERIFICATION STATEMENT : This modification was tested at the National Weather Service Headquarters NHDA and NMTR, Silver Spring, MD (SLVM2).

TIME REQUIRED : 4 to 6 hours

TECHNICAL SUPPORT : For questions or problems regarding these installation instructions please contact Franz J.G. Zichy at 301-713-1833 x128. For any other questions, please contact the NCF at 301-713-9344**.**

INTRODUCTION

Two Linux Servers (PX1 and PX2) are added to off-load processing from the existing Data Servers (DS) and to improve overall data flow performance. The addition of the PX1 and PX2 Linux Servers increases server performance by moving the Satellite, Grib, and Bufr Ingest to the new servers. Refer to exhibit 1 Linux Preprocessor Hardware.

DEVICE CONFIGURATION

The two Dell PowerEdge Linux PX devices are connected through separate SCSI cables to a single Dell PowerVault mass storage unit. Each of the PX devices has an internal PERC/3 RAID card. The redundant array of independent disks (RAID) card has its own CPU, memory, and battery backup to ensure data integrity in the event of a hardware failure. The SCSI cables from each of these internal RAID cards are connected to one of two internal Enclosure Management Module (EMM) cards in the back of the mass storage unit. These EMM cards control data flow to the mass storage device. The mass storage unit is set up with two RAID arrays (also known as containers or logical drives) with four physical drives in each RAID array. The RAID arrays are RAID level 5 with the data and parity disks striped across all drives. Although the parity disk reduces the number of available data disks by one, it helps ensure data integrity.

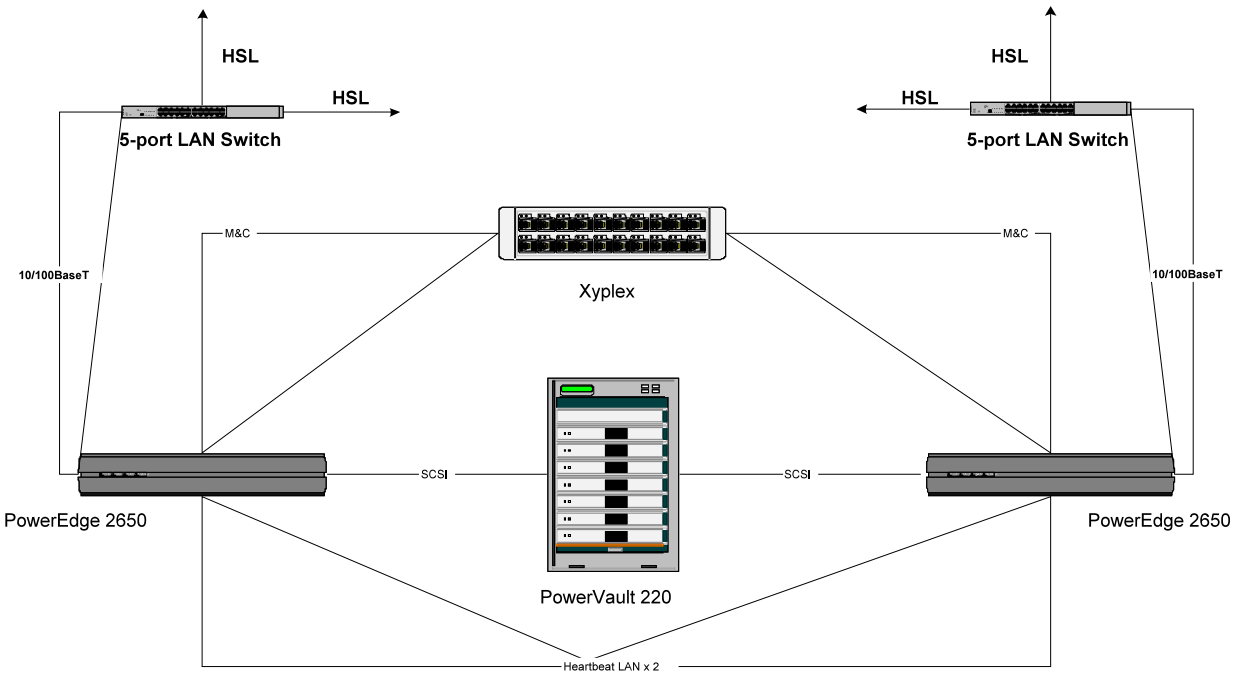


Exhibit 1

The PowerVault mass storage unit is configured and controlled via the PERC/3 RAID cards' onboard software. At this time, access to the software is available during a PX reboot. Dell provides a Windows utility to control the PowerVault while the PX is on line, but the utility has not been tested. The RAID cards are in a "cluster mode" configuration. Any configuration changes to the mass storage unit configuration on one of the RAID cards is sent to the other card. If one of the PX devices is down when changes are made to the other card, a warning message during the boot process displays that a configuration mismatch has been found. The operator will be required to bring up the management software to reread the mass storage disk configuration. For more information on the preprocessor configuration, refer to the AWIPS System Manager's Manual for OB1.

NOTE: Installation Guidelines

- ESAs should schedule the Preprocessor (PX) installations with their AWIPS regional focal points
- AWIPS regional focal points should coordinate the PX installation using Netscape calendar set aside for AWIPS software upgrades The attached document provides instructions on how to access:

  http://calendar.netscape.com
- NCF/NGIT upgrade support is available from 7AM to 7PM EDT, Monday through Thursday.
- OCONUS sites requiring installation assistance outside the set support hours on Thursdays must coordinate with the NCF a day in advance.
- A maximum number of 3 sites per day will be upgraded in the AWIPS time-frame noted above.
- Review the complete modification note before performing the installation.
- If any of the installation instructions require further clarification, call the NCF.
- Sites must coordinate the PX installation with their regional or NCEP Center AWIPS focal point. COMT, the Training Center, systems at WSH, and the OSF should schedule their upgrade with franz.zichy@noaa.gov at WSH or schedule themselves using the calendar feature on Netscape set aside for AWIPS software upgrades.

GENERAL

Call the NCF before performing this installation. Read each step **thoroughly** before performing a procedure. If errors are encountered, **DO NOT** continue. Call the NCF http://www.ops1.nws.noaa.gov/awips_new.htm for the latest modification note update.

NOTE:	Sites must be at Release OB1 before performing this modification.

The complete PX installation will take approximately 4 to 6 hours. Ensure no severe weather is anticipated during the 6 hours. There will be approximately 1 hour of PX downtime during the install.

A. PX2 Retrofit Installation Procedure

1. As **root** on DS1, back-up `PX1:/awips/fxa` and `PX1:/awips/ops` by typing:

   ```
   cd /home/awipsadm/install
   script -a /home/ncfuser/InstallPX-FMK.out
   ./PX_FMK.sh backup
   ```

   (This will take approximately 7 minutes)

2. Remove the blank panels from below the existing PowerEdge 1650 PXs (figure 1). [Note that figures 1 through 4 are images of a site with the PX's in the SB rack, so the positioning of the PXs will be different on the AS2 rack.]

3. Log into PX2 as **root** and swap px2apps package to PX1.

   ```
   cluadmin -- service relocate px2apps
   ```

Figure 1

4. Shutdown PX2 by typing:

   `shutdown -h now`

5. Disconnect all the cables from PX2.

6. Using two people, carefully pull PX2 out, lift it up off the slide rails, and place it aside (figure 2).

7. Remove PX2's slide rail kit from the rack. To ease deinstallation and reinstallation, pull PX1 partially out of the rack (figure 3) and remove the lower rear screws on PX1's slide rails (figure 4) prior to installing the new PX2 slide rail.

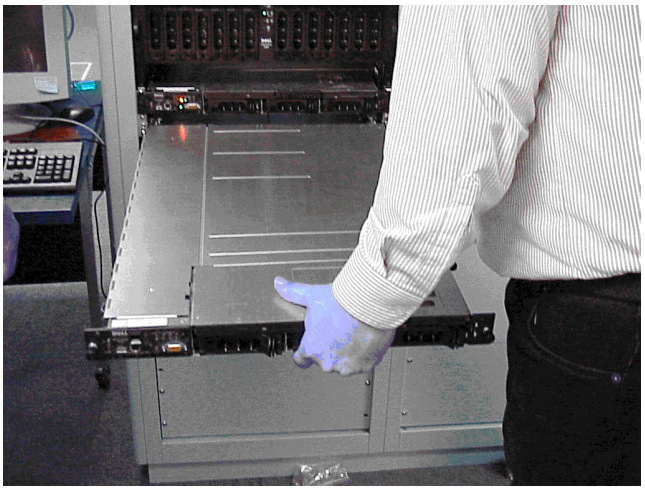


Figure 2

Figure 3

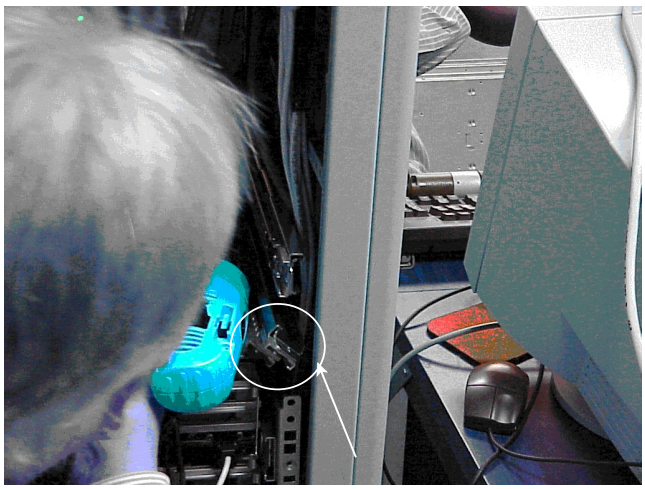


Figure 4

8. Using two people, attach the new PX 2 slide rails to the front and center vertical rack rails by inserting screws into the slide rail mounting plates at the 16th and 21st hole below the Modem Nest (figure 5). Three holes should be visible between the top of the new slide rail and PX1. Do not fully tighten the screws at this time.

9. Due to the limited amount of workspace, the lower screws in the rear mounting plates may be inserted at the 18th hole position (below the Modem Nest). Do not fully tighten the screws at this time.

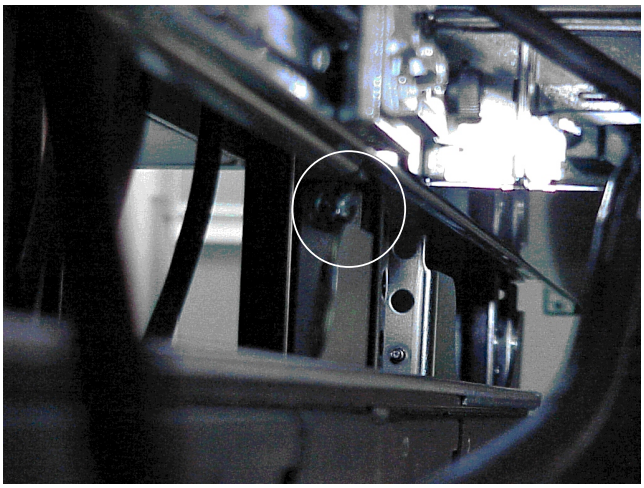


Figure 5

10. Fully extend the PX2 slide rails ensuring that they securely latch in the extended position.

11. Using two people, lift the PX2, and beginning with the rear-most slots, slide the shoulder nuts (on the side of the chassis) into the rails slots. After all the shoulder nuts are in their appropriate slots and the PX is sitting on the mounting rails, push rearward on the unit to latch it into the rails (figure 6).

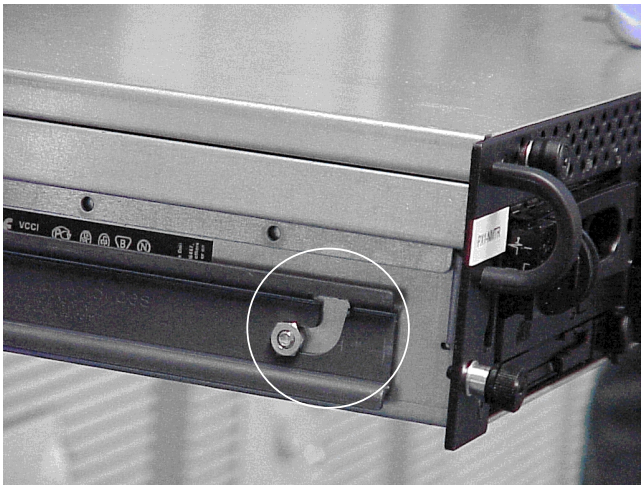


Figure 6

12. Release the rail lock mechanisms by pushing up on the green levers on the outer sides of the slide rails, carefully slide the PX2 chassis into the rack until the rear of the chassis is at the center vertical rail position. Tighten the slide-rail mounting screws from steps 8 and 9. Finish sliding the chassis into the rack and secure it with the fasteners on the lower corners of the front panel.

13. Reconnect all of PX2's cables disconnected in step 5 **EXCEPT** the mass storage SCSI cable (figure 7).

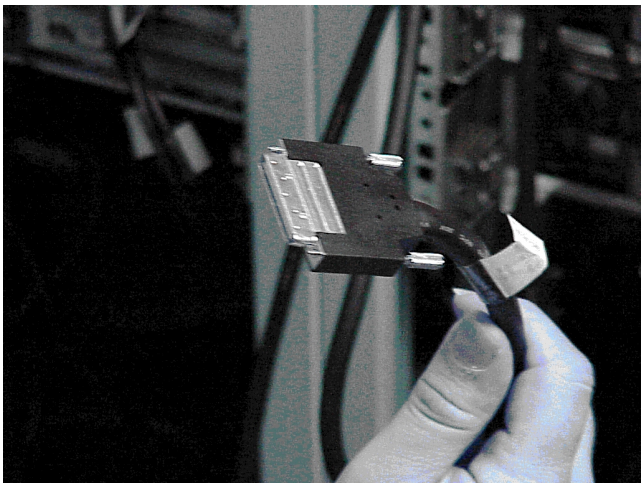


Figure 7

14. Connect the appropriate ends of the new LA1CW121 cable (NWS5115) to Port 3 of PX/SW2 and the ERA Management port on PX2. Note cable connections in figure 8 (see page 13).

15. Connect the PX1AW2 cable (NWS5372) to Serial Port 2 on PX2.

16. Log into PX1 as `root` and disable all packages by typing:

```
cluadmin -- service disable px1apps
cluadmin -- service disable px2apps
```

17. Shutdown PX1.

```
shutdown -h now
```

18. Disconnect all the cables from PX1 (1650).

19. Connect mass storage SCSI cable to PX2.

20. With monitor, keyboard, and mouse attached to the PX, boot up PX2.

    During the PX2 boot process a message will appear that 2 logical drives were found.

21. Log into PX2 as **root** (password **dellpw**) and run the following script to reconfigure the mass storage.

NOTE:	**DO NOT** interrupt the script or run it more than once, as all stored data could be lost. If there appears to be a problem, contact the NCF.

```
script -a /var/tmp/px_ms_config.out
/home/ncfuser/px_ms_config.sh
```

(This will take approximately 30 minutes)

exit (from script)

22. Insure the PX matches the DS date and time by typing:

```
date
```

23. Configure the NIS server on PX2.

```
/etc/init.d/ypserv stop
/usr/lib/yp/ypinit -s ds1-<site>
/etc/init.d/ypserv start
```

NOTE:	Ignore any messages regarding “ypxfrd not running”.

24. Configure the cluster software on PX2 and start the packages. There will be messages that the cluster software cannot connect to PX1 but these messages can be ignored.

```
mv /var/tmp/cluster.conf /etc
cluconfig
```

Press **<Enter>** to accept defaults and continue typing:

```
/etc/init.d/cluster start
clustat
```

(This will take several seconds to initialize)

25. Restart packages on PX2 manually if required by typing:

    ```
    rm –f /etc/cluster/ping.lock
    cluadmin -- service disable px1apps
    cluadmin -- service disable px2apps
    cluadmin -- service enable px1apps
    ```

    select PX2 from menu and type:

    ```
    cluadmin -- service enable px2apps
    ```

    select PX2 from menu and type:

    ```
    clustat
    ```

This completes the PX2 retrofit installation procedure.

B. PX2 AWIPS Software Installation Procedure

1. On DS1 (as **root**), install AWIPS software by typing:

   ```
   cd /home/awipsadm/install
   script -a /home/ncfuser/InstallPX-FMK.out
   ./PX_FMK.sh px2
   ```

   Ignore lines with ".logPref" and "stty:"

   (This will take approximately 20 minutes)

   exit (from script)

2. Call the NCF if the output shows errors. Warnings about the Data Monitor can be ignored.

This completes PX2 AWIPS software installation procedure.

C. PX1 Retrofit Installation Procedure

1. Using two people, carefully pull PX1 out, lift it up off the slide rails and place it aside.

2. Remove PX1's slide rail kit from the rack.

3. Install the new PX1 slide rails directly above the PX2 slide rails. Insert the screws into the front and rear mounting plates at the 10th and 15th holes. As in section A, step 9, the lower screws in the rear mounting plates may be inserted two holes higher to ease installation. Do not fully tighten the screws at this time.

4. Fully extend the PX1 slide rails ensuring that they securely latch in the extended position.

5. Using two people, lift the PX1, and beginning with the rear-most slots, slide the shoulder nuts (on the side of the chassis) into the rail slots. After all the shoulder nuts are in their appropriate slots and the PX is sitting on the mounting rails, push rearward on the unit to latch it into the rails.

6. Release the rail lock mechanisms by pushing up on the green levers on the outer sides of the slide rails, and carefully slide the PX1 chassis into the rack until the rear of the chassis is at the center vertical rail position. Tighten the slide-rail mounting screws from step 3 above. Finish sliding the chassis into the rack and secure it with the fasteners on the lower corners of the front panel.

7. Reconnect all of PX1's cables disconnected in section A, step18, **INCLUDING** the mass storage SCSI cable.

8. Connect the appropriate ends of the LA1CW120 cable (NWS5115) to Port 3 of PX/SW1 and the ERA Management port on PX1.

9. Connect the unconnected end of the PX1AW2 cable (NWS5372) to Serial Port 2 on PX1.

10. Boot up PX1. During the PX1 boot process there should be a message that it found 2 logical drives.

11. Insure that the PX matches the DS date and time by typing:

    ```
    date
    ```

12. Configure cluster software on PX1 and relocate px1apps to PX1 by typing:

    ```
    rm -f /etc/cluster/ping.lock
    cluconfig --init=/dev/raw/raw1
    ```

a. Press **<Enter>** to accept defaults

b. If the cluconfig command produces an error such as:

```
Warning: Cluster daemon 'cluhbd' is running
```

Stop the cluster by entering:

```
/etc/init.d/cluster stop
```

c. Re-enter the **cluconfig** command.

13. Start the cluster software by typing:

```
/etc/init.d/cluster start
```

Verify that the cluster started correctly by typing:

```
clustat
```

Move the package from PX2 to PX1 by typing:

```
cluadmin -- service relocate px1apps
```

14. Configure the NIS server on PX1 by typing:

```
/etc/init.d/ypserv stop
/usr/lib/yp/ypinit -s ds1-<site>
/etc/init.d/ypserv start
```

This completes the PX1 retrofit installation procedure.

D. PX1 AWIPS Software Installation Procedure

1. On DS1 (as **root**), install AWIPS software by typing:

   ```
   cd /home/awipsadm/install
   script -a /home/ncfuser/InstallPX-FMK.out
   ./PX_FMK.sh px1 LASTPX
   ```

   Ignore lines with ".logPref" and "stty:"

   (This will take approximately 10 minutes)

   exit (from script)

2. Call the NCF if the output shows errors. Warnings about the Data Monitor can be ignored.

This completes the PX1 AWIPS software installation procedure.

E. Finalizing PX Installation Procedure

1. Change the PX root password to match the AWIPS root password.

2. Install the blank panels between PX2 and AS2.

3. Replace the existing LA1CW118 and LA1CW119 Monitor and Control cables (NWS5195) with the LA1CW118 and LA1CW119 cables (NWS3050) included in the FMK.

4. Using the 2650 boxes and the FedEx shipping labels provided, return the old PXs to the NOAA warehouse.

This completes the PX retrofit installation procedure.

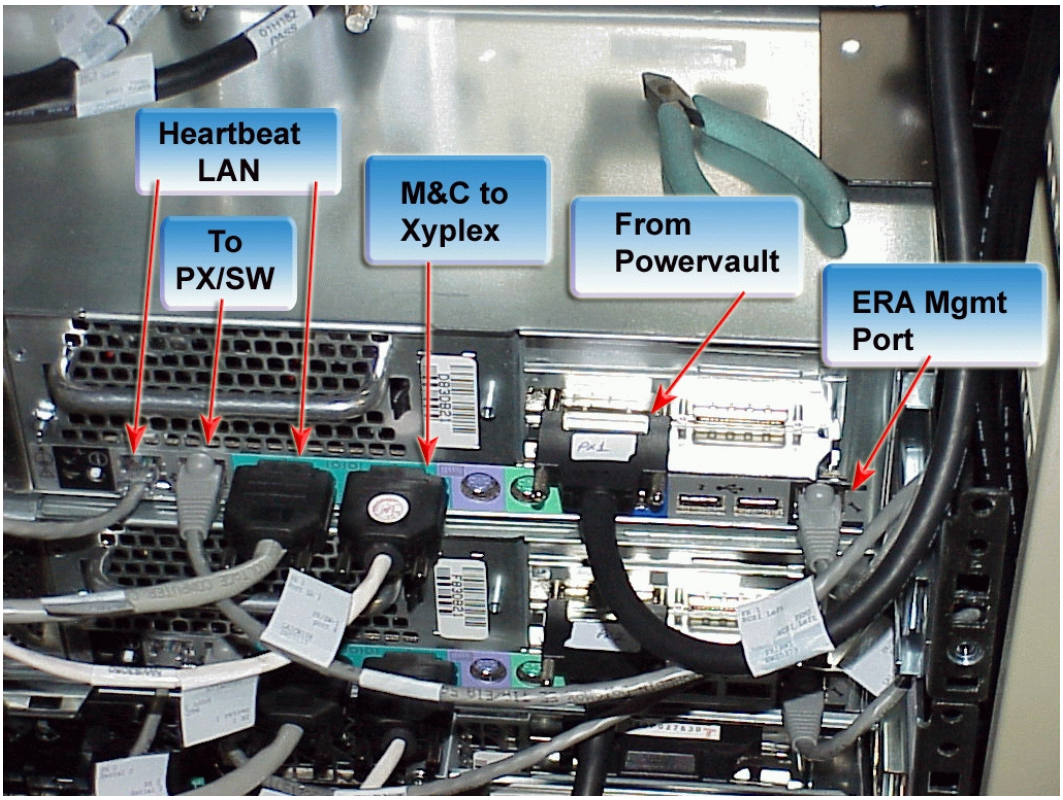

Heartbeat LAN
To PX/SW
M&C to Xyplex
From Powervault
ERA Mgmt Port

Figure 8

REPORTING MODIFICATION

Report the completed modification using the Engineering Management Reporting System (EMRS) according to the instructions in the NWS Instruction 30-2104, Maintenance Documentation, Part 4, and Appendix F. A sample EMRS report is included as an attachment. As an additional guide, use the information in the table below.

Block #	Block Type	Information
5	Description	Retrofit two Linux Pre-Processors I.A.W. AWIPS Modification Note 13 (for AS2 racks)
7	Equipment Code	AWIPS
8	Serial Number	1
15	Comments	Serial number of new LINUX PX 1: _____ Serial number of new LINUX PX 2: _____
17a	Mod. No.	13

Signature Not Verified

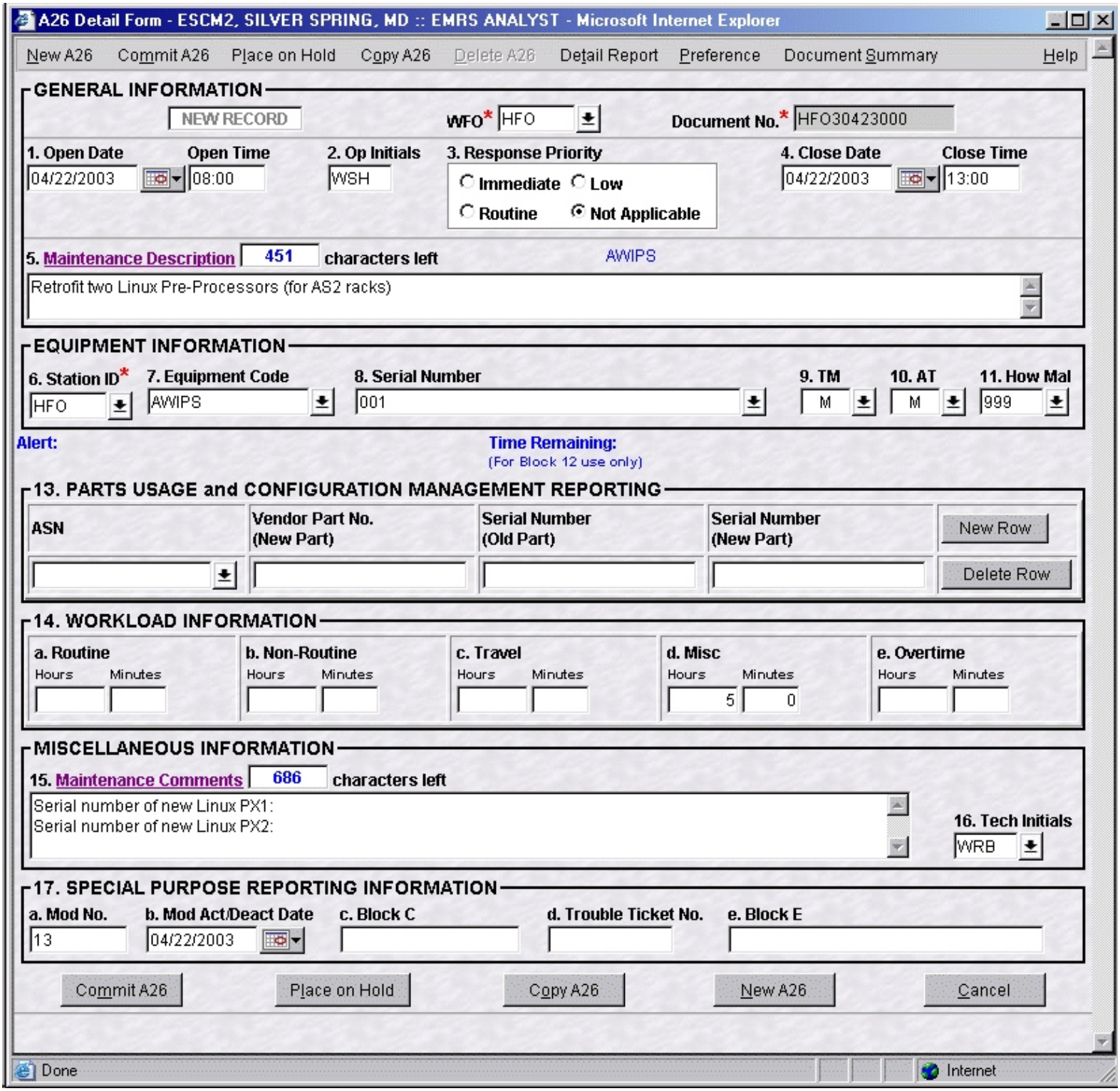
Mark S. Paese

Digitally signed by Mark S. Paese
DN: cn=Mark S. Paese, o=DOC/NOAA/NWS, c=US
Date: 2003.04.25 07:13:42 -04'00'

Mark S. Paese
Director, Maintenance, Logistics, and Acquisition Division

Attachment A - List of Affected Sites
Attachment B - Sample EMRS Report

Attachment A - List of Affected Sites

AWIPS ID	Region	City	State	Office Type
HFO	Pacific	Honolulu	HI	WFO
PBP	Pacific	Honolulu	HI	PRH
SPC	NCEP	Tulsa	OK	NCEP

Attachment B - Sample EMRS Report