Zhone Tech Tip TT#33

February 15, 2011

900 Power Cable Maintenance

This procedure is provided to our customers experiencing intermittent and unexplained PSU alarms that raise and clear on their own. Please refer to Zhone Field Advisory bulletin 20071206-2 ***FAB – IMACS Power Supply OOS Alarm*** in order to clear these alarms.

This Tech Tip is written to describe the process used to clean the power cable on the IMACS-900 shelf. Please refer to Zhone Tech Tip #34 for the proper procedure if maintenance to clean the power cable is required on an IMACS-600 or IMACS-800 shelf. The IMACS-900 uses a 18-pin wiring harness to connect the power PCB to the shelf PCB. The cable is shown in Figure 1.

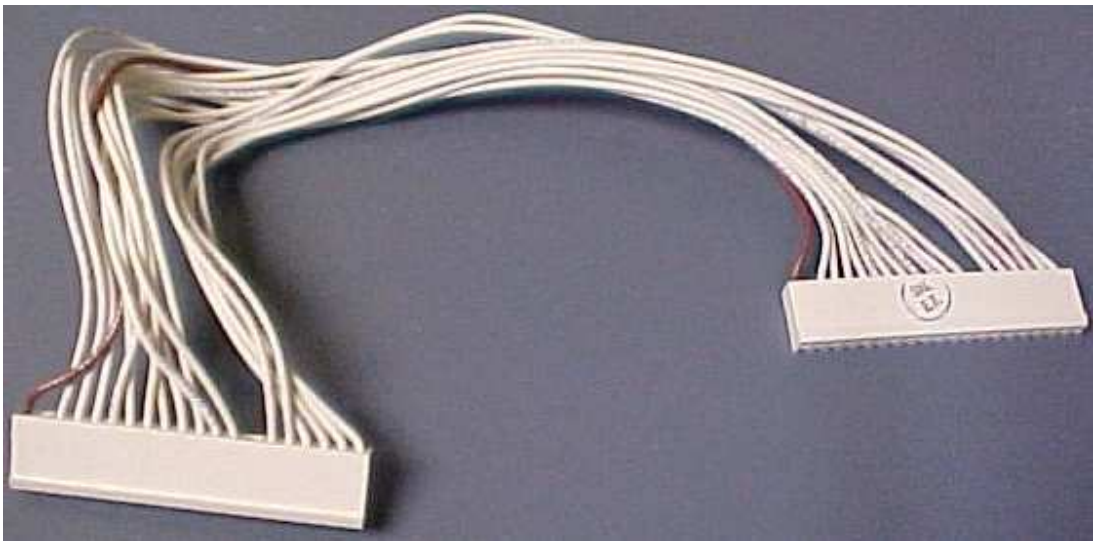

Figure 1: Power Cable IMACS-900

This procedure is provided to augment the Field Advisory bulletin 20071206-2 ***FAB – IMACS Power Supply OOS Alarm***. This Tech Tip provides greater detail on the item under the section for Valid Alarms of that bulletin, and specifically the note that indicates:

- **Bad physical connection on the wiring harness cable due to oxidation or poor environmental conditions. Remove wiring harness, clean with degreaser and alcohol solvent, apply NO-OX-ID lubricant and reconnect wiring harness.**

NOTE: This procedure requires that the IMACS be powered-down to perform this service. Be sure to remove all power sources from the IMACS before beginning this

procedure. It is also recommended that all jewelry (rings, watches etc.) be removed prior to working on the IMACS shelf. Failure to use caution before beginning this procedure could result in shock and / or injury. A properly grounded work area is required to prevent any damage to the equipment.

Tools Required:

The following tools will be required:

- Slotted screwdriver
- Phillips screwdriver
- Degreaser such as ElectrO-Wash by Chemtronics.
- Non-conductive oxidation reducer such as NO-OX-ID
- Pair of wire cutters
- Two zip ties

Procedure Overview:

This procedure to clean the power supply cable is for the IMACS-900 shelf. It is suggested that this procedure be performed on any IMACS shelf over ten years old at the same time as the Interface card battery replacement. To find out more about the Interface card battery replacement, call your Zhone representative and ask about GSS service product codes 3021AR and 3021FG. This power cable maintenance procedure can be done anytime a PSU OOS intermittent alarm condition exists, and should also be performed as routine maintenance once a shelf reaches ten years old. This procedure details the location of the cable, the removal and cleaning of the cable and posts, the re-installation of the cable and confirmation of the IMACS service level at the end of the procedure.

Power Supply Cable Location:

The following illustrates the location of the Power Supply Cable.

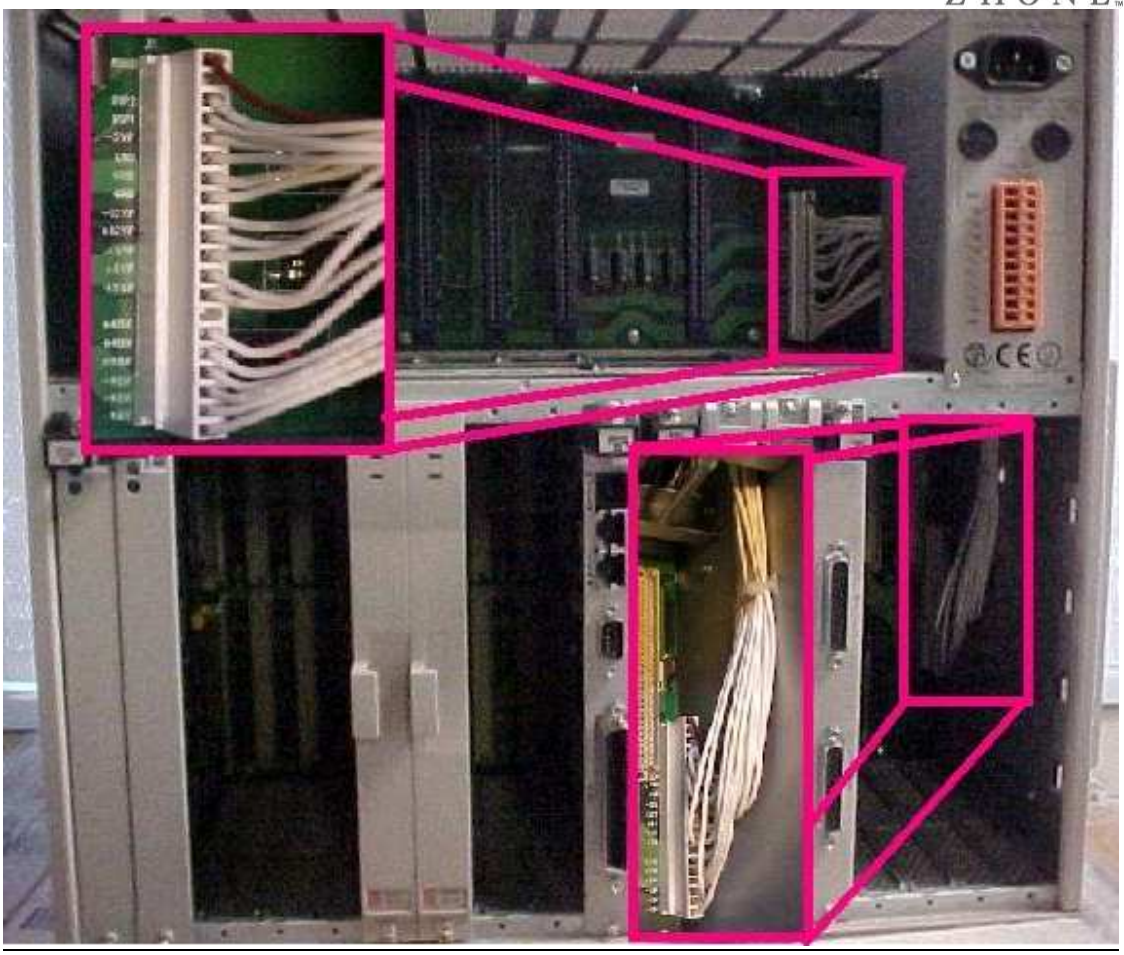

Figure 2: IMACS-900 Power Cable Location

The Power Supply cable is located on the front of the IMACS-900 and extends between the top power supply portion of the shelf behind slot F2 and the lower shelf backplane behind circuit card slot U8.

Note that the brown wire of the cable is oriented to the top of the cable connector.

Cable Removal:

In order to remove the cable, it will be necessary to remove power from the shelf. Prior to starting, it should be recorded what cards occupy which slots. It is highly recommended to perform a database backup prior to beginning the procedure (save to flash, save off-shelf). In order to have room to maneuver, it is recommended that the cards around the cable connector be removed to allow for plenty of room to work on the shelf.

Procedurally:

1. Back up system image to flash. On the main login screen, enter 'Y' for system. Select 'B' for backup, and change 'PROTOCOL' from ASCII to

'FLASH' and then enter 'G' for GO. If prompted, choose 'y' to overwrite the existing saved copy of nvram.

2. Back up system image off shelf (ASCII, TFTP). If unclear how to perform this action, please refer to section **4.12.1 Test, Debug, Backup & Restore** of the ***System Reference Guide*** for more information.
3. Disconnect all power from the shelf.
4. Remove all jewelry on fingers and wrists, up to the elbow.
5. Remove power supply cover from the front of the shelf.
6. Record circuit pack locations – refer to Table 1.
7. Remove circuit packs around the work area to allow for maneuvering.
8. Remove the power cable.
9. Clean the power cable.
10. Clean the posts.
11. Replace the IF card battery on shelves nine years old or older.
12. Replace the power cable.
13. Replace the circuit packs.
14. Reconnect power to the shelf
15. Validate service.

In order to service the power cable on the IMACS 900, the power block at the upper right hand corner of the shelf must be removed. Refer to figure 3 below to identify the securing screws which must be removed in order to service the unit.

Figure 3: Power Block Screw locations

The removal of the power block will reveal the locations of the tie-wraps which must be cut in order to allow for the removal of the power cable. Refer to figure 4 below to identify the locations to cut the tie-wrap holders. Use extreme caution when cutting these tie-wraps to ensure that the power cable is not accidentally damaged.

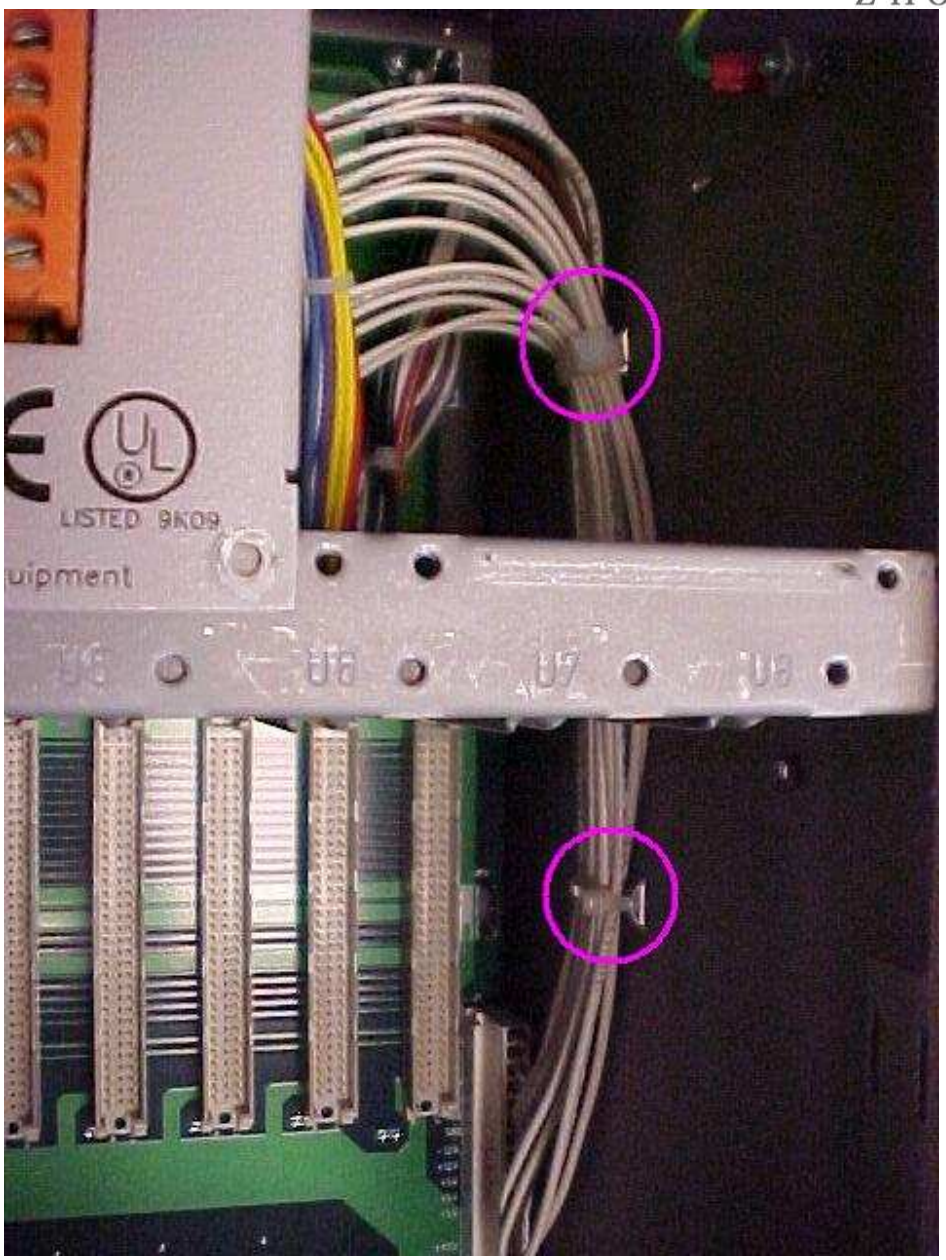

Figure 4: Power Block moved - tie-wrap locations

Once the tie-wraps have been cut and removed, the power cable can then be removed from the shelf by threading the cable through the slot to the right of location U8.

The cable is held in place by locking edges on the connector and the mating connector housing. This mechanism is used to securely hold the cable to the motherboard – see Figure 5 below.

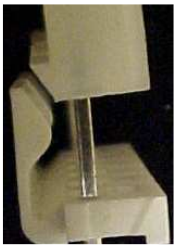

Figure 5: Mate and Lock Connector

This cable will take some force to overcome this connection. Room to maneuver inside of the IMACS housing will allow for maneuverability. Care should be taken to not break the lip on the backplane side of the connector, as a ten-tear old connection might become brittle. Upward force on the cable, or a small wedge (such as a screwdriver tip) inserted between the two flat surfaces can result in a successful de-coupling of the connector.

Cable Cleaning

Both ends of the cable can be cleaned in turn by using a spray degreaser into the receptor holes of the cable. The degreaser should mention that it is suitable for use on PC boards. Once both ends of the cable have been cleaned, then a non-conductive oxidation preventative can be applied directly into the receptor holes of the cable connector.

Post Cleaning

Similar to the cable ends, the posts on the IMACS backplanes should also be cleaned with the degreaser used above. A non-conductive oxidation preventative should be rubbed onto the metal posts to ensure complete coverage and coating.

Cable Replacement

Once the cable and posts have been thoroughly cleaned and coated, the cable can then be replaced.

When re-installing the cable, ensure that the brown wire is oriented towards the top of the connector, matching the original.

Be careful to thread the cable through the slot to the right of user card U8, so that the cable can then be re-fastened to the side wall of the IMACS-900 shelf. The action of installing the cable onto the posts also provides some abrasive cleansing, so placing the cable onto the posts and then removing it a few times helps to ensure a more thorough contact area.

Take care to line up the cable with the posts to ensure all pins are mating with the cable connector. The cable ends have a lip on them that will mate and lock with the connector on the board side. Use some force when installing the cable connector to make sure that it locks into place on the board. If the cable does not lock, make sure it is oriented properly.

Reconstructing the Unit

Now that the cable has been replaced, the two tie-wraps that were cut in order to remove the cable need to be replaced. Thread a tie-wrap through the metal holders located on the side wall of the IMACS-900 shelf as illustrated in Figure 4 above. These cable ties secure the cable to the shelf, so that they do not interfere with the user card in slot 8, nor with the power block that has been temporarily moved out of the way.

Once the tie-wraps have been used to secure the cable to the side of the enclosure, the power block can then be placed back into its original location as illustrated in Figures 2 and 3.

With the power properly routed, the individual cards should be replaced as documented in Table 1. Care should be taken to properly secure each card into its respective slot in accordance with the recorded data.

Validation

With all the cards now firmly in place, the unit is ready for power to be applied. Reconnect the power source to the IMACS shelf, and validate the proper status displayed on the individual cards, when such status indicators exist. Log into the IMACS shelf, and validate that the status of each card is correct, and validate services. Once the unit has been verified, it is once again advised to save a database to an off-site location.

Designator	Card		Designator	Card
C1			IF	
C2			W1	
P1			W2	
P2			W3	
P3			W4	
U1			F1	
U2			F2	
U3			R1	
U4			R2	
U5			HP1	
U6			HP2	
U7			NS1	
U8			NS2	

Table 1: Card Locations