

***** DRAFT *****

CRS Transmitter Recovery During Severe Weather

These instructions are geared toward emergency recovery from CRS problems that effect one or more transmitters, but not the whole system. These problems have been intermittent at various sites and seem to occur during severe weather where the quick movement of multiple hazard events causes frequent CRS Schedule updates (i.e. rapidly moving lines of thunderstorms). The symptoms vary but include either silence or constant repetition of a single product (and only that product) on one or more (but not all) transmitters.

Another frequent issue is repeated CRS event alarms indicating that a “Non-broadcasted Active Watch/Warning Msg has EXPIRED!”. This causes frequent audible alarms and will block the broadcast of incoming products of identical type. Failure to quickly address this problem will cause a significant decrease in available system resources that will eventually leave the system unresponsive. This happens when a watch or warning product does not play at least once prior to its replacement or expiration.

While these conditions can generally be resolved by taking CRS down, loading a daily database backup ascii file and re-sending all AWIPS products; the downtime required for this has a huge negative impact during severe weather outbreaks. Prior to taking that step, here are some things to try to resolve the problem. Any impact and/or risk associated with each approach is noted to allow an informed decision by the WFO personnel as to what is feasible based on the weather conditions at the time.

1. REMOVE ALL NON-BROADCAST WATCH OR WARNINGS

Check the alert monitor messages for the error message and note the VIP ID number (you may need to scroll right to see it). Go into the “Messages” pull down menu, select “weather messages” and find the record with the noted VIP ID. Highlight the record and then press enter to select it. Set the record to INACTIVE then click on the save icon. This should make the alarms stop, if not, check to see if there are additional VIP IDs listed in the alert monitor. You will need to go through this process for each non-broadcasted watch or warning. Once the alarms have stopped acknowledge the alert monitor messages relating to the products made inactive to remove the alert monitor messages. In some cases the broadcast monitor screen will continue to show the problem product. If this occurs, close and re-open the broadcast monitor screen. If you still see the problem product you may “cut” the product from the broadcast cycle screen AFTER you have made it inactive.

(When time permits see longer description of this problem including causes and how to prevent on the CRS web site.)

2. DISABLE THEN RE-ENABLE THE PROBLEM TRANSMITTER(S)

Go into the Transmitter pull down menu – click on Transmitter Configure - select the transmitter with the problem – set it to disable and save. Wait about a minute then select the same transmitter – set it to enable and save.

3. SWITCH THE BACKUP FEP IN FOR THE ONE DRIVING THE PROBLEM TRANSMITTER

NOTE IMPACT: This will cause all transmitters on the switched front end processor to go silent during the switching process (generally 3-5 minutes). There is always the possibility when changing the configuration particularly with a pre-existing issue, that the switch could fail causing further impact. Weather (location and severity) will dictate whether this option is feasible.

Identify which front end processor is driving the hung transmitter. If in doubt go to the Maintenance pull down – select Site Configuration – select the Channels tab – click on transmitter # of problem transmitter from the “channels” section and the driving FEP will be displayed in the FEP field.

To perform the switch go to the maintenance menu – select Front End Processor Switch – switch the FEP driving the problem transmitter OUT and set backup processor to YES for the problem processor and save.

THE FOLLOWING STEPS SHOULD ONLY BE PERFORMED BY AN ADMINISTRATOR PROFICIENT WITH BOTH CRS AND UNIX

4. DIAGNOSE AND RESOLVE A HUNG VM_AO PROCESS

NOTE RISK: There is some risk associated with this procedure since it involves killing a process that is integral to the CRS system. While the system is usually able to re-spawn the vm_ao process, there is still some risk that the application restart will fail. If it cannot re-spawn the vm_ao process, there will be no output from CRS to the transmitter in question until CRS is stopped and successfully restarted.

Sometimes, the vm_ao process which actually drives the output to the dectalk card becomes hung. These processes run on whichever front end processor is driving the hanging transmitter. First try to determine whether this is the problem you have. In a unix shell, switch user to crs and rsh to the fep which drives the hanging transmitter. Find the vm_ao processes on the fep (`ps -ef |grep vm_ao`). You will see a vm_ao process for each processor that is driven by that fep – here is an example from 1fep which is

driving transmitters 1 (/crs/bin/vm_ao 1) through 4 (/crs/bin/vm_ao 4) and 14 (first playback channel):

```
1FEP{crs} ps -ef |grep vm_ao
  crs 18241 17045 TS 80 0 Jul 13 ?    4:16 /crs/bin/vm_ao 4
  crs 17493 17045 TS 80 0 Jul 12 ?    6:34 /crs/bin/vm_ao 3
  crs 17495 17045 TS 80 0 Jul 12 ?    0:02 /crs/bin/vm_ao 14
  crs 17492 17045 TS 80 0 Jul 12 ?    6:33 /crs/bin/vm_ao 2
  crs 18240 17045 TS 80 0 Jul 13 ?    6:16 /crs/bin/vm_ao 1
  crs 19465 19451 TS 85 0 11:21:49 inet/tcp022 0:00 grep vm_ao
1FEP{crs}
```

The number just to the left of the process name is the amount of CPU processor time used by that process. While the number varies depending on how active the transmitter has been, it should go up if the process is working. If you repeat the command every minute or two for at least three minutes, you should see all EXCEPT the vm_ao process for the hanging transmitter increase. If your hanging transmitter shows the same amount of clock time used while the other vm_ao processes go up, your problem is probably that the vm_ao process is hung.

Prepare to try to correct the problem by preventing audio output from CRS to the transmitter. You can unplug the output, or its phone line to do this. This is important because if you are successful in clearing the blockage, all interrupt products which have been sent to the hanging transmitter since the blockage began will play – complete with their associated EAS tones. On an active transmitter there could be a number of toned interrupt products (many of which have since expired) waiting to play.

Once you have prevented output to the transmitter, use the ps -ef |grep vm_ao command to make sure the process time still has not gone up on the hanging transmitter's process. Note the process id of the hanging process from the left most column of numbers displayed by the grep command. In the example above they are: 18241 for transmitter 4, 17493 for transmitter 3, 17492 for transmitter 2 and 18240 for transmitter 1.

Do a kill -9 on the hanging process (double check the command and PID before hitting enter. It should go away and be re-spawned by its parent with a new PID. It should then begin to use processor clock time.

It will play each interrupt product in its backlog – you can see this in the broadcast cycle screen but you may need to close it and open it again to update the broadcast cycle screen each time it goes to a new product. Once it plays each of the back logged products once, it will revert to its correct suite of multiple current products.

Once it is playing its correct suite of current products, reconnect the output so that CRS is again driving the transmitter. Close and re-open the broadcast cycle screen one more time and it should begin to update the schedule in the GUI display on its own as usual.

Advise your co-workers that the transmitter is back online, but that since the EAS tones are only played on the first broadcast of a product, any product sent during the blockage would have sent its tones during the recovery period when the transmitter was disconnected and therefore NOT broadcasting. Those products that have not expired will continue to broadcast, but if you would like to send the EAS TONES now that the transmitter is on-line you may resend an existing product or create a new one for just the transmitter which was silent.