



Medical Gas Outlet Analyzer

Model G2000

Model G2500

Electrical Receptacle Analyzer

Model R6000

Model R6500

**Report Generator™
for
Windows®**

User's Guide

Testing made easy. Safety made simple.

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CHAPTER 1: MEDICAL GAS OUTLET ANALYZERS

INTRODUCTION

Now you don't have to juggle pressure gauges, flow meters, pens and paper. Just strap the lightweight Model G2500 Medical Gas Outlet Analyzer around your neck and start testing. It's that simple. The G2500 automatically does a complete analysis in just under fifteen seconds. You'll know immediately if the outlet is acceptable or not and the G2500 will store the results directly in its memory. The test is quick, easy and reduces user error, helping you and your facility meet NFPA and The Joint Commission requirements.

The NST Model G2500 Medical Gas Outlet Analyzer tests oxygen, medical air, nitrous oxide, nitrogen, and vacuum outlets for pressure, flow, pressure drop and correct gas type. The analyzer automatically performs the tests on each outlet, shows the results immediately on a built-in-display and saves the outlet location, test results and a tester's note in its memory.

The printed report from the test results is created using the supplied analyzer-to-computer cable and NST Report Generator™ software to send the data to your Windows® compatible computer. You can then print a report on your computer's screen or printer. The NST Report Generator™ software also provides format capabilities to filter and sort the report, combine multiple reports into one large report, and export data to excel.

The outlet analyzer system includes the analyzer, gas adapters for the five gases, charger, cable and software to connect the analyzer to a Windows® compatible computer, this manual and carrying case.

BECOMING FAMILIAR WITH NST GAS OUTLET ANALYZERS

How to Begin

Begin by attaching the gas hose fitting and its attached 9-pin connector to the rear of the analyzer. Finger tighten the gas hose fitting, tight enough to prevent rotation of the hose. Then, plug the attached 9-pin connector into the back of the analyzer.

Turn on the analyzer by pressing the ON button. If the screen does not light, charge the batteries as described in the section *Caring for NST Medical Gas Outlet Analyzers*.

Connect one of the five gas adapters to the end of the gas hose by pushing the adapter straight into the socket until you hear a click indicating that the adapter is locked into position.

NOTE: The analyzer will shut down automatically to save battery power if not used for five minutes.

Analyzer Display

Take a look at the display. You will see something similar to the following:

aSE rXRAY001 o01 nBR

Notice the lower case letters a, r, o and n. These letters stand for area, room, outlet and note, respectively. To the right of each of these labels are spaces for you to identify each outlet's location (area, room, and outlet number) and enter a note. The area identification can be two characters long and the room identification seven characters long. This information is printed on the report along with the test results.

Changing Outlet Identification Information

You can change each of the characters for area, room and outlet number. First, press the left or right arrow button until the character you want to change is underlined by the cursor. Then, press the up or down arrow button until the letter or number that you want appears.

Helpful Hints:

- If you hold a button down, it will step automatically until released.
- To enter a blank space, press the up and down arrows at the same time or the up or down arrow until the space comes up.
- When entering the outlet identification, you can enter numbers from 01 to 31.
- Changing the area or room number erases any entered note and also sets the outlet number to 01.

Entering Tester's Notes

To select a note, use the left or right arrow button to move the underline symbol to the letter "n". The full length note will then replace the area/room display. Press the up or down arrow button until the note you want is shown. Once the desired note is displayed, press either the left or right arrow button to return to the area/room display. Notice that now the note abbreviation is shown in the area/room display after the letter "n". This note will remain until you clear it or until the room number is changed. You can select one of the following notes to describe a particular condition or perform a special function:

BL	Broken or Loose	Use this note if the outlet or mounting plate is loose, broken or cracked and requires repair. Remember to tag the outlet so you can locate it easily later. The "red dot" stickers supplied with the analyzer are for this purpose. Refer to the section, <i>Untestable Outlets</i> for more information.
DP	Delete Previous	Use this note to remove the results of the last test you did from the analyzer's memory. Refer to <i>Removing a Test Result from Memory</i> for more information.
IT	Improper Type	Use this note if the outlet is the wrong type. Refer to the section, <i>Untestable Outlets</i> for more information.
IC	Incorrect Cover	Use this note if the cover plate for the outlet is incorrect.
LC	Leaky Connector	Use this note if the outlet leaks before or during insertion of the adapter.
NA	Not Accessible	Use this note if the outlet cannot be reached, or if a critical patient support device is plugged into the outlet. Refer to the section, <i>Untestable Outlets</i> for more information.
NS	Non-Standard	Use this note if the outlet type is acceptable for the location, but can't be tested by the analyzer (i.e. not one of the five testable gasses or an outlet for which no probe is available). Refer to the section, <i>Untestable Outlets</i> for more information.
SC	System Check	This note is used to document system checks. Refer to the section, <i>System Check</i> for more information.
SR	Suppress Recording	Use this note if you want to do a test but don't want to store the results in memory.

TESTING MEDICAL GAS OUTLETS

Step by Step Instructions for testing Oxygen, Medical Air, Nitrous Oxide & Nitrogen

1. If necessary, press the ON button to turn on the analyzer. If prompted, remove the adapter from the end of the gas hose.
2. Attach the desired adapter for the outlet to the gas hose (the screen will display the gas probe type momentarily). If necessary, change the area identification.
3. Change the room identification and approach the left most outlet in the room.

4. **Purge the outlet if you suspect that it might contain moisture or contamination.**

Do not use the analyzer to test outlets with liquid or solid contamination or outlets with over 200 psi pressure. Visually inspect the outlet and enter the appropriate note.

5. Plug the adapter into the outlet to be tested. The analyzer will display the message "TESTING...WAIT" and a few seconds later, "UNPLUG PROBE". Remove the adapter from the outlet. Be careful not to separate the adapter from the hose.

Special Instructions for Vacuum Tests:

Follow the instructions below for your type of adapter. Your analyzer will come with one of two types of vacuum adapters

Vacuum Flow Test (using the "Vacuum" adapter with brass flow orifice)

1. Set the flow in a nearby vacuum inlet, on the same zone as the inlets to be tested, to 3SCFM (85 lpm). This can be done easily using the Vacuum Flow Regulator.
2. Using the vacuum adapter with the brass flow orifice, cover the flow orifice on the vacuum adapter with your finger before plugging the inlet to be tested. When prompted by the display to: "ALLOW FLOW, PRESS ➡", remove finger and press the right arrow button on the analyzer front panel to perform the flow test on the inlet being tested.
3. The analyzer will display the message "TESTING...WAIT" and a few seconds later, "UNPLUG PROBE". Remove the adapter from the outlet. Be careful not to separate the adapter from the hose.

Vacuum Pressure Test (using the "Vacuum Pressure Only" adapter)

1. Set the flow in a nearby vacuum inlet, on the same zone as the inlets to be tested, to 3 SCFM (85 lpm). This can be done easily using the NST Vacuum Flow Regulator.
2. Using the Vacuum Pressure Only adapter, plug the adapter into the inlet to be tested. When prompted by the display to: "SET 85 LPM, PRESS ➡", be certain that step one has been performed and press the right arrow button on the analyzer front panel to perform the static pressure test on the inlet being tested.
3. The will display the message "TESTING...WAIT" and a few seconds later, "UNPLUG PROBE". Remove the adapter from the outlet. Be careful not to separate the adapter from the hose.

Chapter 1: Medical Gas Outlet Analyzers (Models G2000 – G2500)

After testing a gas or vacuum outlet, the analyzer will beep and display one of the following results:

Message on screen	Meaning	# of Beeps
OUTLET IS OK	OK in any location.	1
OUTLET IS BAD	Detected gas different from expected gas.	5
OUTLET IS BAD	Pressure or flow beyond limits or bad note.	2
NO TEST PERFORMED	The note entered requires no test. Note and the location of outlet will still be saved.	1

If you want to see the actual test values, press the up arrow before the area/room display returns, usually within 3-4 seconds. Each time you press the up arrow another test value will be displayed. Parameters beyond test limits are tagged with a “*”. Press the right arrow to return to the area/room display or wait for it to return automatically.

If there are more outlets in the room, advance the outlet number and go back to step 4.

Remember to do a visual inspection, enter appropriate notes and tag any bad outlets with the supplied “red dot” stickers

If you try to do a second test with the same outlet number the analyzer will display the message “**Pull, Edit Outlet**”. Pull out the adapter to return to the area/room display, and then make any changes. If you want the same outlet number, change the outlet number, then change it back again.

Key Points to Remember

1. Carefully choose letters and numbers to identify the area and room. Be both systematic and creative, and don't choose anything you might not understand later. Be consistent from year to year so that comparing data will be easier. Look at the sample report for examples.
2. Be consistent with the way your outlet numbers relate to the outlets in the room. For example, upon entering a new room, always turn to the left to find the first outlet. Then, continue to move around the room in a clockwise direction.

3. Always set the outlet number on the display to identify the next outlet to be tested. The analyzer will tell you to edit the outlet number if you try to do more than one test without changing the outlet number. If you really want to keep the same outlet number (such as when retesting an outlet), change the outlet number, then change it back again.
4. If appropriate, clear tester's note back to 'no note' before testing the next outlet. This happens automatically when an area or room character is changed.
5. Purge any line suspected to contain contamination or moisture prior to testing.
6. Examine the analyzer frequently for contamination from the gas lines. Clean if dirty.
A dirty analyzer can give incorrect results!

Untestable Outlets

Some outlets can't be tested. If you find an untestable outlet, first attach the appropriate adapter. Enter the area, room, and outlet and select an appropriate note (Not Accessible, Improper Type, etc.). Lastly, disconnect the adapter from the hose while the note is on the screen. The analyzer will record the outlet's location, then display the message "**NO TEST PERFORMED.**" Press the right arrow to return to the area/room display.

Removing a Test Result from Memory

Perhaps you did a test and then realized that the area or room was incorrect. Or, maybe you removed the adapter from the outlet too soon. If this happens, you might want to remove the results of the last test from memory and retest the outlet. This way, the mistake won't appear on the printed report. To delete the last test from memory, follow the steps listed below:

1. Increase the outlet number.
For example: To delete outlet number 10, increase the outlet number to 11.
If you are at the highest outlet number permissible by the analyzer, increasing the outlet number will set the number to 1.
2. Select the note "Delete Previous" from the note menu.
3. Remove the adapter from the gas hose. The analyzer will display the message "**OUTLET DELETED**" and the "**Delete Previous**" note will be cleared automatically.

4. After deleting the unwanted test, return the outlet number to the previous number and retest the outlet.

For example: To retest outlet number 10, change the outlet number from 11 back to 10 and retest outlet number 10.

NOTE: The "Delete Previous" function can only remove the most recent test performed. Performing a "Delete Previous" twice in succession will not delete two tests.

CARING FOR NST MEDICAL GAS OUTLET ANALYZERS

System Check

We recommend that you perform a System Check before and after each test session and after exposure to contamination or pressures over 200 psig. Using this feature, you can check the accuracy of the analyzer by testing positive-pressure outlets with accurately known pressure and flow characteristics.

To perform a System Check, select the note "System Check," then plug the appropriate adapter into a positive-pressure gas outlet with known pressure and flow characteristics. Also check the analyzer with each gas type. Examine the test results by repeatedly pressing the up arrow. If the results seem incorrect, discontinue testing and call NST.

Batteries

The analyzer should operate for about 15 hours per battery charge. To recharge, plug the charger into the back of the analyzer. If the analyzer is on, the message **"PROBE: CHARGER"** will appear on the analyzer screen. An overnight charge is sufficient. Battery life will be shortened if you overcharge the batteries.

Cleaning

Keep all areas in the analyzer where gas flows clean. The gas hose and plumbing are transparent to facilitate inspection. Below is the back manifold cleaning procedure:

1. Remove the two screws on the bottom of the analyzer, turn the analyzer over and remove the top portion of the case.
2. Remove the two screws that hold the brass hose connector to the Plexiglas manifold and gently remove the brass hose connector from the manifold.

3. Remove the two screws on the inside of the analyzer which hold the motor mount to the Plexiglas manifold and gently slide the motor mount back until the piston or valve has been removed from the manifold.
4. Using a cotton swab wet with only water, gently clean the Plexiglas area where the piston is normally positioned.
5. Remove a portion of the cotton to reduce the diameter of the swab and clean the long chamber in the Plexiglas.
6. Gently remove the small diameter clear tubing from the hose barb on the inside of the analyzer.
7. Gently clean the small flow port, which intersects the long chamber by sliding a small diameter piece of wire through the hose barb and into the Plexiglas manifold.
8. Reassemble the small diameter clear tubing, motor mount and brass hose connector being careful not to over-tighten any of the screws.
9. Reassemble the analyzer case so that the tongue and groove pattern on the side of the case match up properly and be careful not to over-tighten the screws.

CAUTION: Use only hot water when cleaning the Plexiglas manifold and do not lubricate the piston. Some solvents and lubricants are not compatible with Oxygen and can also be harmful to the Plexiglas finish.

Flow Valve Maintenance

The flow valve on the NST Medical Gas Outlet Analyzer is designed to open and close freely under normal operating conditions. However there are times when the valve can become restricted due to contaminants which have built up in the Plexiglas manifold. These restrictions can often cause the analyzer to display the message “**FLOW VALVE PROBLEM**” and automatically shut down. The earlier model of the Gas Analyzer flow valve shown in Figure 1, will experience this problem more often than the latest version shown in Figure 2. To help avoid this problem it is very **IMPORTANT** to purge the outlets before testing with the analyzer and to keep the chambers in the Plexiglas manifold clean at all times. To clean the Plexiglas manifold follow the cleaning instruction outlined above.



Figure 1

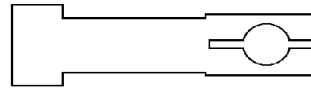


Figure 2

If your analyzer is experiencing problems with the flow valve sticking or remaining open, the following procedure will explain the steps necessary to free or close the valve.

1. Attach the Battery Charger to the Gas Analyzer and press the right arrow button (⇒) on the front panel to turn the analyzer 'ON'.
2. With the analyzer displaying the message **"PROBE: CHARGER"**, press and release the up (↑) and down (↓) arrow buttons on the front panel simultaneously. The analyzer display should change from **"PROBE: CHARGER"** to **"PROBE: NONE"** or **"ADC MSB P: ### F: ###"**. The analyzer is now in the manual test mode.
3. While watching the flow valve, press and hold the right arrow button (⇒) on the front panel. This will free the restricted flow valve and continue to open the flow valve until the button is released.
4. Once the flow valve has been freed, release the right arrow button (⇒).
5. While watching the flow valve, press and hold the left arrow button (⇐) on the front panel. This will close the flow valve until it is resting against the brass manifold connector on the rear of the Plexiglas manifold. Once the valve is closed, release the left arrow button (⇐).
6. Repeat steps 3, 4 & 5 two or three times to ensure that the valve is free.
7. Press and release the up (↑) and down (↓) arrow buttons on the front panel simultaneously to exit the manual test mode.

This procedure should free the valve, allowing more testing to be completed. Purging the outlets prior to testing and keeping the Plexiglas manifold clean will help reduce the frequency of the **"FLOW VALVE PROBLEM"**. If you continue to have these problems contact NST at 800-NST-7074 to arrange having your analyzer returned for evaluation.

Annual Calibration

If you own the analyzer, we strongly recommend that the system be returned to NST for yearly replacement of consumable components, cleaning, and calibration. You must also return the analyzer if you want to alter the minimum and maximum pass/fail pressure limits.

GAS OUTLET ANALYZER TESTS PERFORMED

Expected Gas Type

The gas type of the probe attached to the gas hose determines the expected gas type. Probes are available for oxygen, medical air, nitrous oxide, nitrogen, and vacuum.

Detected Gas Type

The detected gas type is determined by measuring the percent O₂ and percent N₂O in the gas. The range of acceptable values for each gas are as follows:

Detected Gas	Pressure	Min. % O₂	Max. % O₂	Min. % N₂O	Max. % N₂O
Air	over 4 psig	10	30	0	30
Oxygen	over 4 psig	70	100	0	30
Nitrogen	over 4 psig	0	10	0	30
Nitrous Oxide	over 4 psig	0	10	70	100
Vacuum	over 1 inHg				
Unknown	any gas not falling within the above limits.				

Pass/Fail Limits

The analyzer decides the pass/fail status of each outlet by comparing test results with pressure and flow limits programmed into the analyzer and support software. The information that was preprogrammed into your analyzer was obtained from an employee of your institution prior to delivery of the analyzer. You can have these values changed by returning the analyzer to NST. The pass/fail limits for your analyzer and support software appear on page two of each printed report.

Static Pressure

Static pressure is the gauge gas pressure when no gas is flowing. It is measured one second after the screen first displays “**TESTING...WAIT**”. When testing vacuum outlets, be sure that the max. flow port on the gas adapter is covered before insertion or the static pressure result will be incorrect. The outlet fails the static pressure test if the pressure is not within the pass/fail limits programmed into the analyzer and support software.

Flow Pressure (For Non-Vacuum Gasses)

Flow pressure is the pressure at the output end of the test probe when gas is flowing at the specified rate. The analyzer opens an internal valve until the specified flow is reached or the pressure drops below the minimum pass/fail value. If the specified flow is reached

first, the pressure is recorded. (The pressure is measured within the analyzer and is corrected for pressure drop in the hose.) If the minimum pressure is reached first, then the flow value is recorded and the analyzer displays “OUTLET BAD”. The outlet fails the flow pressure test if the flow pressure is not within the pass/fail limits programmed into the analyzer and support software at the specified flow rate.

Pressure Drop

The pressure drop is the difference between the static pressure (no flow) and the flow pressure at the preprogrammed value. It is calculated and displayed in psi to the nearest 1/10 of a PSI. Outlets fail the pressure drop test if the pressure drop is not within the pass/fail limits programmed into the analyzer and support software.

Vacuum Flow (Performed with the Vacuum adapter with the brass flow orifice)

Vacuum flow is the flow that occurs when the outlet is opened wide. This flow occurs when the operator allows flow through the orifice on the vacuum adapter when prompted by the analyzer. The small pressure drop across the orifice is measured by the analyzer and is used to compute the flow. The outlet fails the flow test if the measured flow is below the pass/fail limit programmed into the analyzer and the support software.

Vacuum Pressure (Performed with the Vacuum Pressure Only adapter)

Vacuum pressure is a test of the vacuum inlet static pressure. This test is performed while an adjacent vacuum inlet on the same zone is flowing at 3 SCFM (85 lpm). The flow is set using the Vacuum Flow Regulator. The inlet fails the static pressure test if the pressure is not within the pass/fail limits programmed into the analyzer and support software. This test is labeled “**ADJACENT INLET FLOW**” on the printed reports.

CHAPTER 2: ELECTRICAL RECEPTACLE ANALYZERS

INTRODUCTION

Now you don't have to juggle OKX lights, meters, tension testers, pens and paper. Just strap the lightweight Model R6500 Electrical Receptacle Analyzer around your neck and start testing. It's that simple! The R6500 automatically does a complete analysis in just two seconds. You'll know immediately if the receptacle is acceptable or not and the R6500 will store the results directly in its memory. The test is quick, easy and reduces user error, helping you and your facility meet The Joint Commission requirements.

The NST Electrical Receptacle Analyzer Model R6500 tests 120 volt standard, isolated power and GFCI protected parallel blade three prong receptacles and associated wiring. The analyzer automatically performs up to twelve tests on each receptacle and associated wiring. It shows the results immediately on a built in display and stores each test result in its memory so that a printed report may be generated.

The printed report of test results is generated using the supplied cable and Report Generator™ software to send the data to your Windows® compatible computer. You can then print a report on your computer's screen or printer. The NST Report Generator™ software also provides format capabilities to filter and sort the report, combine multiple reports into one large report, and export data to excel.

The receptacle analyzer system includes the analyzer, reference/power cord, test probe, cable and software to connect the analyzer to a Windows® compatible computer, this manual and carrying case.

BECOMING FAMILIAR WITH NST ELECTRICAL RECEPTACLE ANALYZERS

How to Begin

Begin by attaching the test probe (armored cable with black body) and the reference/power cord (35 foot, gray) to the appropriate connectors on the rear of the analyzer. The connectors mate with a twist, so no force should be necessary.

Next, plug the reference/power cord into any 120 volt electrical outlet in the room.

DO NOT LEAVE THE ANALYZER UNATTENDED WHILE PLUGGED IN!

Analyzer Display

Take a look at the display. You will see something similar to the following:

aSE rXRAY001 o01 nBR

Notice the lower case letters a, r, o and n. These letters stand for area, room, outlet and note, respectively. To the right of each of these labels are spaces for you to identify each receptacle's location (area, room and outlet number) and enter a note. The area identification can be two characters long and the room identification seven characters long. This information is printed on the report along with the test results.

Changing Outlet Identification Information

You can change each of the characters for area, room and outlet number. Press the left or right arrow button until the character you want to change is underlined by the cursor. Then, press the up or down arrow button until the letter or number that you want appears.

Helpful Hints:

- If you hold a button down, it will step automatically until released.
- To enter a blank space, press the up and down arrows at the same time or the up or down arrow until the space comes up.
- When entering the outlet identification, you can enter numbers from 01 to 63 or RE for reference outlet.
- Changing the area or room number erases any entered note and also sets the outlet number to RE (for Reference Outlet).

Entering Tester's Notes

To select a note while testing a receptacle, use the left or right arrow button to move the cursor to the letter "n". The full-length note will then replace the area/room display. Press the up or down arrow button until the note you want is shown. Once the desired note is displayed, press either the left or right arrow button to return to the area/room display. Notice that the note abbreviation is now shown in the area/room display after the letter "n". This note will remain until you clear it or until the area or room number is changed.

You can select one of the following notes to describe a particular condition or perform a special function:

NA	Not Accessible	Use this note if the receptacle cannot be reached or if a critical patient support device is plugged into the receptacle. Refer to <i>Recording Untestable Receptacle</i> on page 18.
BR	Broken or Loose	Use this note if the receptacle or mounting plate is loose, broken, or cracked and requires repair. Remember to tag the receptacle so you can locate it easily later. The “red dot” stickers supplied with the analyzer are for this purpose. Refer to <i>Recording Untestable Receptacle</i> on page 18.
IT	Improper Type	Use this note to document the location of receptacles that are the wrong type, such as two-prong receptacles. Refer to <i>Recording Untestable Receptacle</i> on page 18.
NS	Non-Standard	Use this note if the receptacle type is acceptable for the location, but can’t be tested by the analyzer (i.e. twist-lock and explosion proof receptacles). Refer to <i>Recording Untestable Receptacle</i> on page 18.
IP	Isolated Power	You <u>must</u> use this note when testing isolated power receptacles. Refer to <i>Testing Isolated Power Receptacle</i> on page 18.
GP	GFCI Protected	You <u>must</u> use this note when testing receptacles wired through a Ground Fault Circuit Interrupter. Refer to <i>Testing GFCI Protected Receptacle</i> on page 17.
SC	System Check	This note is used to document system checks. Refer to <i>Performing</i> on page 20.
DP	Delete Previous	Use this note to remove the results of the last test you did from the analyzer’s memory. Refer to <i>Removing A Test Result From Memory</i> on page 18.
SR	Suppress Recording	Use this note if you want to do a test, but don’t want to store the results in memory.

Display Entry Error Checking

The analyzer will display the message “**PULL, EDIT ROOM**” if you try to begin a test in a new room without changing the area and room description (it knows you’ve entered a new room because the reference/power cord was unplugged).

Pull out the test probe to return to the area/room display, then make any changes. If you really want to keep the same area and room description, change one character in the area or room identification and then change it back again.

The analyzer assumes that you will be testing duplex receptacles. If you try to do a third test with the same outlet number, the analyzer will display the message “**PULL, EDIT OUTLET**”. Pull out the test probe to return to the area/room display and then make any changes. If you really want the same outlet number (such as when testing a double-duplex), change the outlet number, then change it back again.

TESTING ELECTRICAL RECEPTACLES

Step by Step Instructions

1. To test the receptacles in a room, you must first locate an acceptable reference outlet. Plug the reference/power cord into the upper half of the first duplex on the left, when entering the room.
2. Set the area and room description. If this is the first outlet entered for this area and/or room, the outlet number will be automatically set to “RE” for Reference Outlet.
3. The analyzer will display the message “**TESTING...WAIT**” and a few seconds later, “**PULL SLOW & STRAIGHT.**” Pull out the test probe smoothly without applying any twisting or side forces on the pins.
4. After the test, the analyzer will beep and will display the test results as follows:

Message On Screen	Meaning	# of Beeps
OUTLET IS OK	OK in any location.	1
BAD IN NEW CONSTRUCT	Bad in new construction area, OK elsewhere.	2
BAD IN NEW, CC AREA	Bad in new construction and Critical Care Area, OK elsewhere.	2
BAD IN ANY AREA	Unacceptable at any location in hospital.	2
NO TEST PERFORMED	The note you entered requires no test. The location of the receptacle and note will still be saved.	2

5. If the lower half of the duplex tests “OK,” a valid reference has been established. Move the power plug to this outlet. The outlet number displayed on the analyzer will automatically change to 01.

If the outlet fails, move the power plug to another duplex and continue with step 3. Repeat these steps until a good reference outlet has been established.

6. Once a good reference has been established, test the other receptacles in the room. Move around the room in a clockwise direction, starting with the outlets remaining in the same duplex or double-duplex as the reference (these should be numbered 01). Advance the outlet number for each duplex or double-duplex (or after a simplex if one is tested).

Remember to do a visual inspection, enter appropriate notes and tag any bad receptacles with the supplied “red dot” stickers.

Testing Tips:

1. The analyzer will automatically change the outlet number to 01 after a reference test.
2. If the first receptacle in the duplex tested OK, you can test the 2nd receptacle without waiting for the area, room display to return. Pressing the **right arrow** button will return you to the area, room display immediately after testing an outlet.
3. After testing an outlet, you may review the results of each test performed. To do this, you must press the up arrow within 5 seconds, before the area/room display returns. Each time you press the up arrow, another test value will be displayed. Parameters bad in any area are tagged with a “*”. Parameters bad only in new construction or critical care areas are tagged with a “?”.

Press the right arrow to return to the area/room display or wait for it to return automatically. You can abort the result display by plugging the test probe into the next receptacle.

Testing GFCI Protected Receptacles

To test a receptacle wired through a Ground Fault Circuit Interrupter, follow the same procedure used above and **set the note to “GFCI PROTECTED” or “GP”**. If this note is not set, the GFCI will trip and make the test results invalid. Don’t forget to clear the GP note after testing GFCI receptacles.

Testing Isolated Power Receptacles

This test is more successful when the reference outlet is a standard outlet, not an isolated power outlet. To test a receptacle that is part of an isolated power system, follow the procedure above and **set the note to “ISOLATED POWER” or “IP”**. If this note is not set, the analyzer will not do the tests correctly. Don't forget to clear the IP note after testing isolated receptacles.

NOTE: The analyzer may activate the alarm in your isolated power monitor.

Recording Untestable Receptacles

Some receptacles cannot be tested. If you find an UNTESTABLE receptacle, first enter the area, room, and outlet. Then, select an appropriate note (i.e. Not Accessible, Improper Type or Non Standard). Lastly, pull on and release the test probe's ground pin.

The analyzer will record the receptacle's location and display the message **“NO TEST PERFORMED.”** Press the right arrow to return to the area/room display.

Sometimes the note “Broken or Loose” applies to an untestable receptacle. If a receptacle is so badly damaged that it can't be tested, identify the area, room and outlet, choose the note “Broken or Loose,” then pull on and release the test probe's ground pin. The analyzer will display **“WIRING BAD”** because the test probe wasn't plugged into a receptacle, but the note will appear in the report.

Removing A Test Result From Memory

Perhaps you did a test and then realized that the area or room was incorrect. Or maybe you pulled out the test probe too soon. If this happens, you might want to remove the results of the last test from memory and retest the outlet. This way the mistake won't appear on the printed report. To delete the last test done from memory, follow the steps listed below:

1. Increase the outlet number.
For example: To delete outlet number 10, increase the outlet number to 11.
If you are at the highest outlet number permissible by the analyzer, increasing the outlet number will set the number to 1.
2. Select the note “Delete Previous,” from the note menu.
3. Pull on the ground pin of the test probe and then release. The analyzer will display the message **“OUTLET DELETED”** and the “Delete Previous” note will be cleared automatically.

4. After deleting the unwanted test, return the outlet number to the previous number and retest the outlet.

For example: To retest outlet number 10, change the outlet number from 11 back to 10 and retest outlet number 10.

NOTE: The “Delete Previous” function can only remove the most recent test performed. Performing a “Delete Previous” twice in succession will not delete two tests.

Key Points to Remember

1. DO NOT LEAVE THE ANALYZER UNATTENDED WHILE PLUGGED IN!
2. For each room, always establish a valid reference outlet for the reference/power cord and label it “**RE**” on the analyzer display. The reference/power cord carries test signals used for the ground to ground and phase tests. If the analyzer reference/power cord is not plugged into a receptacle that tested “OK,” all other outlets in the room may appear bad.
3. Always set the outlet number on the display to identify the next receptacle to be tested. Except for the reference outlet, each receptacle within a duplex, double-duplex, etc. should be tested with the **same outlet number**. Look at the *Sample Report* to see examples of how outlets should be numbered. Notice that the reference outlet is RE and that the other receptacle in the same duplex as the reference is numbered 01. Each duplex after that is numbered 2-2, 3-3, 4-4, etc.
4. If you try to do more than one test with the outlet number set at RE or 01, or more than two tests with any other outlet, the analyzer will tell you to edit the outlet number. If you really want to keep the same outlet number, such as when testing a double-duplex, change the outlet number and then change it back again.
5. Carefully choose letters and numbers to identify the area and room. Be both systematic and creative, and don’t choose anything you might not understand later. Be consistent from year to year so that comparing data will be easier. Look at the sample report for examples.

6. Be consistent with the way your outlet numbers relate to the receptacles in the room. For example, upon entering a new room, always turn to the left to find the first receptacle. Then, continue to move around the room in a clockwise direction.
7. If appropriate, clear the tester's note back to 'no note' before testing the next receptacle. This happens automatically when an area or room character is changed.
8. You don't have to wait until the memory is full before transmitting the data to your computer or to NST via the modem, for leased analyzers. The analyzer will hold data for approximately 2200 receptacles. When the memory is full the analyzer will display the message "**MEMORY FULL**". At this point, the data has to be removed from the memory before additional receptacles can be tested.

CARING FOR NST ELECTRICAL RECEPTACLE ANALYZERS

Performing a System Check

The receptacle analyzer includes a self-check feature. We recommend that you do a system check occasionally to make sure the analyzer is operating properly.

To do a system check, select the note "System Check," then plug the test probe into the receptacle on the rear of the analyzer. If the analyzer displays an "Edit" message, make an appropriate change, then try again. This receptacle should test "OK." If it does not test OK, discontinue testing and call NST at 800-NST-7074 or 610-408-0555.

IMPORTANT: The receptacle on the rear of the analyzer should never be used to power another piece of equipment. Internal damage to the analyzer may result.

Routine Maintenance

1. Check for corrosion on the test probe and reference/power cord pins. This can cause high resistance for some of the measurements. You can polish the pins with 600-grit sandpaper. Some emery cloth is supplied with the analyzer for this purpose.
2. Check the test probe ground-pin for wear. If this pin becomes very worn, the analyzer will not measure ground-pin contact tension correctly and can also result in high resistance measurements. Return the test probe to NST for ground-pin replacement.

Annual Calibration

The NFPA requires that electrical safety test instruments shall be tested periodically, but not less than annually, for acceptable performance (Section 4.3.3.1.5 NFPA 99 Health Care Facilities, 2005 edition).

We recommend that the analyzer be returned to NST for annual calibration or when improper operation is suspected. We will check its accuracy, adjust it as necessary, and install any updates or enhancements.

ELECTRICAL RECEPTACLE ANALYZER TESTS PERFORMED

Wiring

Connection of the three wires in the wall to correct receptacle screw terminals is important for proper power delivery and patient safety.

Standard and GFCI Wiring

Three wiring tests are performed corresponding to the standard “OKX” test.

1. The “O” test is a measure of proper hot and neutral wiring. An “O” is printed in the wiring column only if the hot to neutral voltage exceeds 50 volts.
2. The “K” test is a measure of proper hot and ground wiring. A “K” is printed in the wiring column only if hot to ground voltage exceeds 50 volts.
3. The “X” test is a measure of proper neutral to ground wiring. An “X” is printed in the wiring column if the neutral to ground voltage exceeds 4 volts.

Isolated Power Wiring

On receptacles that are part of an isolated power system, proper wiring is confirmed by two wiring tests:

1. The “PWR” test is a measure of proper hot wiring. “PWR” is printed in the wiring column if the open circuit voltage across the hot pins is less than 50 volts.
2. The “ISO” test is a measure of isolation of the hot wiring from ground. “ISO” is printed in the wiring column if either hot pin resistance to ground is less than approximately 200 ohms per line volt.

If both power and isolation tests pass, “OK” is printed.

Line Voltage

Line voltage delivered to medical devices must be within proper limits for proper equipment operation and to prevent equipment damage. Open-circuit line voltage is measured between the hot and neutral pins of the test probe. Voltages below 100 volts and above 130 volts are considered unacceptable.

Phase

The phase difference between the test probe and power hot to ground voltages is measured. The phase is considered “IN” if the shift is less than 30 degrees and “OUT” if over 30 degrees. The phase will be “IN” if the test probe and power receptacles are both connected to the same side of the 220-volt line and out of phase if connected to opposite sides of the 220-volt line. Both conditions are acceptable, but “IN” is preferred because of lower worst-case leakage path voltages.

Neutral To Ground Voltage

High voltage implies either a poor connection between the neutral and ground circuits or high line voltage drop because of improper power wiring or excessive loading. This voltage is measured between the test probe neutral and ground pins in pass/fail fashion. Voltage above 4 volts is unacceptable.

Neutral To Ground Resistance

Low neutral to ground resistance is important for proper operation of fuses and circuit breakers. Low resistance prevents high neutral to ground voltage. The resistance is measured between the neutral and ground pins on the test probe. A 60 Hz full wave rectified unfiltered test current of 0.7 ampere peak is used to generate a voltage across the neutral to ground resistance. The test starts at a zero crossing of the test current and lasts for 0.3 second or until the generated voltage rises above 0.5 volt (whichever comes first). The average generated voltage is used to compute the resistance by Ohm's law. Resistance over 1.0 ohm is unacceptable. The resistance measurement includes:

- Resistance of the neutral and ground screw contacts in the receptacle.
- Resistance of the neutral and ground wires back to the common connection point (usually the distribution panel).
- Corrosion and dirt on the receptacle neutral and ground contacts.
- Corrosion and dirt on the analyzer test probe neutral and ground pins.

A short test duration and low test current have been chosen to minimize risk to patients connected to the power system and to prevent false low-resistance values caused by welding. Consequently, this test will not detect fusing effects caused by poor contacts in the presence of large fault currents.

Ground To Ground Voltage

Ground to ground voltage is measured between the test probe ground pin and power plug ground pin. High ground to ground voltage poses a significant shock hazard to patients connected to more than one medical device at a time. In critical areas, the maximum allowable voltage is 0.02 volt for new construction and 0.04 volt for old construction. In non-critical areas, 0.5 volt is allowable.

Ground To Ground Resistance

Low ground to ground resistance is critical to patient safety because it prevents dangerous voltage buildup induced by leakage currents flowing in the ground system. It is measured between the test probe ground pin and the power plug ground pin. A 60 Hz full wave rectified unfiltered test current of 0.7 ampere peak is used to generate a voltage across the

Chapter 2: Electrical Receptacle Analyzers (Models R6000 – R6500)

ground to ground resistance. The test starts at zero crossing of the test current and lasts for 4/60 second or until the generated voltage rises above 0.5 volt (whichever comes first). The average generated voltage is used to compute the resistance by Ohm's law. The resistance measurement includes:

- Resistance of the ground screw contacts in the two receptacles.
- Resistance of the ground wires between the two receptacles.
- Corrosion and dirt on the two receptacle ground contacts.
- Corrosion and dirt on the analyzer test probe and power plug ground pins.

A short test duration and low test current have been chosen to minimize risk to patients connected to the power system and to prevent false low-resistance values caused by welding. Consequently, this test will not detect fusing effects caused by poor contacts in the presence of large fault currents.

Contact Tensions

Low contact tension can cause unreliable electrical contact and poor retention of the plug in the receptacle. The gripping force or "contact tension" of the hot, neutral, and ground contacts in the receptacle are independently measured in a pass/fail fashion and are considered unacceptable if below four ounces (eight ounces in California). Hot and neutral tension results are displayed as power tension and are unacceptable if either tension is low. Ground tension is displayed independently.

Accuracy of Data for Tests Performed:

Wiring polarity:	standard OKX test valid between 99 - 135 VAC
AC Line voltage:	100 - 130 Volts ± 2 VAC
Neutral-to-ground resistance:	$\pm 20\%$ ± 0.01 ohms between 0 - 2 ohms
Neutral-to-ground voltage:	$\pm 20\%$ < 4 volts
Ground-to-ground resistance:	$\pm 5\%$ and ± 0.01 ohm between 0 - 0.2 ohms
Ground-to-ground voltage four ranges:	20 mV $\pm 20\%$ 40 mV $\pm 15\%$ 500 mV $\pm 10\%$ 500 mV - ∞ $\pm 10\%$
Tensions:	4 oz (115 g.) ± 0.4 oz $\pm 10\%$ (California 8 ounces)

Data Collection Capacity:

Stores test results for approximately 2,200 outlets.

CHAPTER 3: REPORT GENERATOR™

INTRODUCTION

National Safety Technologies' Report Generator™ for Windows® allows you to collect, store and view data collected from your Medical Gas Outlet and Electrical Receptacle Analyzers. Report Generator allows you to prepare comprehensive reports for The Joint Commission audits as well as shorter, more specialized reports for troubleshooting and system repairs.

HARDWARE REQUIREMENTS & INSTALLATION INSTRUCTIONS

Report Generator™ requires Windows 95 or higher operating system. A serial port (COM1 or COM2, 25 or 9 pin) is also required for downloading data from the NST analyzers. If your computer does not have a serial port please contact NST for a USB to serial adapter.

The Report Generator™ for Windows® software is provided on one CD-ROM, which contains the program installation files.

Note for Users of Previous Versions of Report Generator™ for Windows®:
Report Generator™ for Windows® will not overwrite previous versions of Report Generator™ for Dos for the Medical Gas Outlet or Electrical Receptacle Analyzers.

Installation Instructions for Windows 95 or Higher

1. Insert the installation CD into the CD-ROM drive.
2. Select **Start** and then select **Run**.
3. In the **Run** window, type **D:\SETUP** (where D is the label of the CD-ROM drive) and press **OK**.
4. Follow the instructions on the computer screen.
5. Click **INSTALL**.

STARTING REPORT GENERATOR™

From the **Start Menu**, click on **Programs** and then on **NST Report Generator**. After the opening screen, the **Main Menu** will appear. From the **Main Menu**, you can access all of the components of Report Generator. Following is a list of the primary buttons and their purpose:

Collect Data: This option is used to download test results that have been collected and stored in the analyzer and to save them to a data file.

View Report: This option will create reports using any of the data files that have been downloaded using Report Generator™ for Windows® or other versions of Report Generator. Using **View Report**, you can also format reports, print reports and export reports.

Print Report: This option allows you to select the reports to be printed and add any necessary formatting or comments before printing.

Export Data: This option allows you to select the reports to be exported and add any necessary comments before exporting into a comma-delimited file for inclusion into other compatible programs.

DOWNLOADING TEST RESULTS INTO REPORT GENERATOR

To download test results that you have collected in the analyzer, click on the **Collect Data** button on the **Main Menu**. When you click on **Collect Data**, instructions will appear describing how to connect the analyzer to your computer and begin the data transmission.

Saving Downloaded Data

After transmission, you will be prompted to enter a name for the new file containing your data. File names can contain up to 255 characters, including spaces. **File names cannot contain the following characters:** \ / : * ? “ < > |. File names should not contain any file extension. Report Generator™ will automatically detect the type of data that is collected and assign the appropriate 3-character extension.

Example:

If You Download Data From:	And You Enter the Following File Name	Your File Will Be Saved As”
Electrical Receptacle Analyzer	MyData	MyData.rec
Medical Gas Outlet Analyzer	MyData	MyData.gas

NOTE: Report Generator™ adds the appropriate 3-character extension so that the data can be properly viewed and printed. Do not overwrite these extensions.

HELPFUL HINT: Choose file names that relate in some way to the contents of the file. This may include the name of the building tested and/or the date the testing was completed (i.e. LAB112707 for Laboratory tested on 11/27/2007).

Erase or Resend?

After the data is transmitted from the analyzer, the analyzer display will show "**⇐ ERASE OR RESEND ⇒**". Before you erase the analyzer's memory, view the results on your computer's screen to insure that all of the data was downloaded successfully. Once you have viewed the newly downloaded data, you should erase the memory in the analyzer so that it will be available for continued testing. To erase data after downloading, press the left arrow ⇐. The display will change to "PRESS ⬆ TO ERASE". Press the analyzer's up arrow ⬆ to erase the memory, and verify that the analyzer displays "MEMORY ERASED". If this message fails to appear, call NST for service.

VIEWING REPORTS

Report Generator™ for Windows® allows you to collect, view and store data from both NST Medical Gas Outlet Analyzers and NST Electrical Receptacle Analyzers. To view files containing NST test result data, choose the **View Report** option from the main menu.

After clicking on **View Report**, you will first need to select the data files containing the test results that you would like to see. To choose which type of file you would like to view, click on the appropriate file heading, either **Receptacle Analyzer Files** or **Gas Analyzer Files**. When you click on these headings, all of the data files available will appear. To choose a file, click on the file name and then click OK. The report will then be created.

Combining Multiple Data Files into One Report

You can combine an unlimited number of the same type of data files into one report. Due to the different types of data collected by each analyzer, you can only view multiple data files collected from the same type of analyzer. To do this, click on each file to be included. Clicking on the file name will highlight the file. To deselect a file, click on the file name a second time and the highlight will be removed. Once you have selected all of the files to be combined, choose **OK** to generate the report.

Understanding Reports

Report Generator™ creates a column for each type of data collected by the analyzer. The first four columns of every report contain the following:

Reference			Area	Room	Outlet	
File	No.	C				

The Reference Column (File, No. and C) is to assist in the identification of the test results. The “File” column lists a number assigned by Report Generator™ for each data file contained in the report. For reports containing only one data file, the File number will be listed as 01 for the entire report. For reports containing multiple data files, the earliest file is numbered 01 and each file created thereafter is numbered sequentially from earliest to latest. When viewed on the screen, each file name and associated number is listed at the top of the screen. When printed, this information is shown on the cover page of the report.

The “No.” column shows the line number for a particular outlet tested. This number is specific to the data file from which it originated. Report Generator™ assigns the first outlet tested the line number of 1 and each test thereafter is numbered sequentially.

The “C” refers to comments. If a comment is entered for a particular outlet, these comments will be listed separately and a “C” will appear in this column.

After the Reference column, the Area, Room and Outlet columns are displayed. The tester enters these the time of testing.

The last two columns of every report are as follows:

	Tester’s Note	Status
--	---------------	--------

The Tester’s Note displays any additional notes that may have been entered at the time of testing. The Status describes the condition of the outlet as determined by the given test results.

Color Coding of Reports

When viewed on screen, outlet data is color coded for easy reference. Black indicates that the outlet tested OK, red indicates that one of the testing criteria is beyond acceptable limits and green indicates that the outlet may be beyond acceptable limits. If you have a color printer, the reports can be printed in this same format.

Viewing the Report Summary

To view summary information about a report, click on the **Summary** button when viewing a report. This will display totals and percentages for each test result.

FORMATTING REPORTS

All formatting is done from the **View Report** option of the Main Menu. While you cannot change any of the test results or any of the information entered by the tester, you can modify fonts and column widths and add comments for further explanation or clarification of test results.

Font Selection and Column Widths

The default font for Report Generator™ for Windows® is `Courier New, Font Size 8`. This setting allows all of columns of data to fit on one page when printed in landscape format. To change this setting, click on the **Font** button at the top of screen in the **View Report** screen. While the font size can be changed, the row height for the report will remain fixed.

To accommodate a larger font, individual column widths can be adjusted. To adjust a column width, move the pointer of your mouse to the heading of the column width you want to change. Your pointer will change to $\swarrow$. When this happens, press the left mouse button and hold it down while sliding the column border to the desired width.

Default Button

This button will return the font to the default of `Courier New, Font Size 8`.

Adding Comments to a Report

While the actual test results cannot be changed or overwritten in any way by Report Generator™, comments can be added to provide explanation or clarification of test results. To add a comment to a particular test result, click on the reference column of that outlet. The outlet you have selected will be highlighted. Then, click on the **Edit Comment** button at the top of the screen. A box will appear in which you can type a comment or explanation. Click on the box labeled Enter Comment and begin typing your message. After you have typed in the desired message, click on **Save**. Report Generator™ will place a “C” in the Comments Column of the selected outlet.

To view all of the comments entered, click on **View Comments**. Report Generator™ will display a table as follows:

Reference File No. C	Comments
01 1 C	

When the test results are printed, a Comment Report containing this information will appear on a separate page following the test data.

Comments can be entered at any time. It does not matter whether the data is being viewed in a report of only one data file or with multiple data files. Once entered, comments are saved to a comment file in the NSTdata folder. Since all saved comments are assigned to the outlet in which they were entered, these comments will appear every time the data file is viewed, regardless of whether the file is viewed separately or combined with multiple data files into a single report.

Changing or Deleting Comments

To change or delete a comment, click on the reference column of that outlet to highlight it. Then, click on the **Edit Comment** button. The comment box will appear in which you can delete or retype the comment. After you have made the necessary changes, click on **Save**. If the comment is completely deleted, the “C” will be removed from the Comment Column.

FILTERING TEST RESULTS

Report Generator™ for Windows® has several features to aid in the analysis of test results. Specifically, reports can be created which contain only the specific test results in which you are interested.

NOTE: All filtering of test results will be noted at the top of the screen in viewed reports and on the cover page of printed reports. Filtering is also noted on the Summary Report. If no filter has been applied, the filter name will be “(Display All)”.

To filter test results, click on **Filter/Sort** while viewing a report. Report Generator™ filters data using IF fields. To filter data in a report:

1. Click on the down arrow in the **Column to Test** box and select the title of the column containing the data you are interested in.
2. Click on the **Relationship** box and select the situation or condition you are interested in isolating.
3. Click on the **Limit** box and select or enter the testing criteria. This will determine which data will get displayed and which data will be omitted. All data that meets the criteria will be displayed.

NOTE: For more complex filtering, you can combine two IF statements by entering a second set of criteria after the ---AND---.

Examples of Filters for Medical Gas Outlets:

Column to Test	Relationship	Limit	Result of Filter
Status	Contains	Bad	This will display all outlets which contain the word “bad” in the Status column. In other words, this will display all failed tests.
Status	Contains	Untested	This will display all untested outlets.
Detected Gas	Contains	Air	This will display all outlets detected as air outlets.
Tester’s Note	Contains	Incorrect Cover	This will display all outlets in which the person doing the testing entered the code IC to indicate the cover plate for the outlet is incorrect.

Examples of Filters for Electrical Receptacle Outlets:

Column to Test	Relationship	Limit	Result of Filter
Status	Contains	Bad	This will display all outlets that contain the word “bad” in the Status column. In other words, this will display all failed tests.
Status	Contains	Untested	This will display all untested outlets.
NEU-GRD	Starts With	Hi*	The Neutral to Ground Column displays two readings. First it shows voltage (Volt) and then resistance (Ohms). This filter will display all outlets in which the Voltage was over the limit.
NEU-GRD	Ends With	Hi*	This filter will display all outlets in which the Resistance was over the limit.
NEU-GRD	Contains	Hi*	This filter will display all outlets in which either the voltage or the resistance was over the limit.

Display only last test of each outlet

This is a check box located below the filtering criteria. When this box is checked, Report Generator™ will identify all test results that have the same Area, Room and Outlet Number. For these test results, Report Generator will display only the most recent test result. This feature is useful when retesting after doing a repair to an outlet. If an outlet has been repaired successfully and retested, only the “OK” test result will appear on the report.

Save & Recall

If there is a filtering routine that you will be using again, you can save that routine by clicking on the **Save** button. Saved filters can then be recalled at any time by clicking on the **Recall** button.

Clear Filter

To remove all filters applied to a report, click on **Clear Filter**.

SORTING TEST RESULTS

In addition to filtering, test results can be sorted in a multitude of ways to bring attention to specific information. To sort test results, click on **Filter/Sort** while viewing a report. Depending upon whether the report is a Medical Gas Outlet report or an Electrical Receptacle report, there will be several options available. Click on the desired option and then click **OK** to sort report.

When there is more than one criteria listed in the Sort option, Report Generator™ will sort the test results by the term listed first and then perform the additional sorting in the order in which they appear.

For Example:

Sorting Option:	Sorting Procedures Performed:
μ Area, Room, IOT	• First, data will be sorted by area – numerically and then alphabetically. • Next, within each area, the test results will be sorted by room. Numerically and then alphabetically. • Finally, within each Room, the outlets will be sorted in the order they were tested (IOT).

When test results are sorted, the Reference information (file number and outlet number) does not change. They remain based on the order in which the outlets were tested.

NOTE: Any sorting of test results will be noted at the top of the screen in viewed reports and on the cover page of printed reports. The default **Sort** setting is *In Order Tested (IOT)*. When this option is selected, the test results are shown in the order that they were collected.

PRINT REPORTS

From the **Main Menu**, you can print a report from either the **View Report** button or the **Print Report** button. Once one of these options has been selected, choose the files to be included in the report and click on **OK**. Format the report as desired. Apply any filters or sorts desired. Click on **Print**.

The following components can be included in a report by checking off the corresponding boxes:

- ☐ Header Pages
- ☐ Outlet Data and Comments
- ☐ Summary

Header Pages

There are two header pages. The first header page is the title page and the second header page is the Explanation of Codes. The title page includes the names of all of the data files in the report and the dates those data files were originally downloaded. This page also lists the filtering and sorting options applied to the report.

Additional information, which may be shown in the title page includes the names of the institution, the individuals performing the testing (the “Tester(s)”) and the department compiling the report. There is also space to provide a contact phone number and additional comments.

To edit this information, click on the **Review/Update Header Page Information** button located in the **Print Data** box.

NOTE: The information located in the **Facility(s)** box is information that has been entered into the analyzer by NST. This information cannot be deleted or overwritten.

The second page of the report is the Explanation of Codes for the report. This page describes all of the testing performed by the analyzer and the pass/fail criteria used for each

test. This information is based on NFPA and facility guidelines provided to NST upon purchase of the analyzer.

Outlet Data and Comments

The outlet data is printed in tabular form similar to what is viewed on the screen. The comments are reported in a table that is printed on a separate page at the end of the report.

Summary

The summary is printed on a separate page, after the test results. This table displays totals and percentages for each applicable outlet test.

EXPORT DATA

From the **Main Menu**, you can export a report from either the **View Report** button or the **Export Data** button. Once one of these options has been selected, choose the files to be included in the report to be exported and click on **OK**. Apply any filters or sorts desired. Click on **Export Data**. The Export Data box will appear. When you click OK to export the file, Report Generator™ exports the data into a file called *export.csv*. This file is put into the default folder, which contains all of the Report Generator™ data files. The default location for this is:

C:\NST Report Generator\nstdata

Export.csv is a comma-delimited file, which can then be converted to a number of different formats for a variety of spreadsheet and other applications.

When Report Generator™ exports data, the new file is always given the name *export.csv*. Therefore, once exported, this file should be renamed to prevent it from being over-written the next time data is exported. (Ex. Mydata.csv)

CHAPTER 4: ADDITIONAL INFORMATION

CONTACT INFORMATION

National Safety Technologies

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Paoli, PA 19301

Local Phone: 610-408-0555

Toll Free Phone: 800-678-7074

Local Fax: 610-408-9594

Toll Free Fax: 800-539-9319

On the Web

www.nst-usa.com

sales@nst-usa.com

techservices@nst-usa.com

RETURNING AN ANALYZER TO NST

Please Note: Analyzers suspected of having a problem should be returned to NST only after discussing the problem with an NST technician. Problems can often be solved over the telephone or visit our website at www.nst-usa.com for Technical Support.

1. Place each of the outlet analyzer components (analyzer, all adapters, cables, any battery charger AC adapters, software disks and analyzer-to-computer cables) in the storage brief case. Keep this manual for future reference.
2. If there are any questions with the operation of the analyzer, include a brief description of the question/concern along with the name of a contact person to discuss the question.
3. Place the storage brief case in a cardboard shipping carton with adequate protection around the brief case.
4. Ship to the Technical Support Office address above using one of the recognized carriers (UPS, FedEx, etc.). Please insure the analyzer for \$7,900 if a Medical Gas Outlet Analyzer or \$6,800 if an Electrical Receptacle Analyzer.
5. Call NST at 800-678-7074 to let us know the analyzer is on the way.

WARRANTY

National Safety Technologies warrants the Model G2500 Medical Gas Outlet Analyzer and the Model R6500 Electrical Receptacle Analyzer to be free from defects in material and workmanship under normal use and service for a period of one year from date of purchase. This warranty shall not apply to any unit or parts subject to alteration, misuse, neglect, accident, or abnormal conditions of operation. In addition, this warranty does not apply to any parts subject to normal wear during operation.

This warranty is limited to repair or replacement by NST of any parts found by NST to be defective. Such repair or replacement will be made without charge, provided the analyzer is returned within one year of the original date of purchase. If the failure is found to be caused by alteration, misuse, neglect, accident, or abnormal conditions of operation, parts and repairs will be billed at the prevailing charges.

NST's liability for damages from any cause whatsoever will be limited to the payment actually received by NST.

IN NO EVENT WILL NST BE LIABLE FOR ANY LOST PROFITS, INCIDENTAL DAMAGES, SPECIAL DAMAGES, OR CONSEQUENTIAL DAMAGES, EVEN IF NST HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN ADDITION, NST WILL NOT BE LIABLE FOR ANY DAMAGES OF THE CUSTOMER BASED UPON A THIRD-PARTY CLAIM.

THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS OF A PARTICULAR PURPOSE.

SAMPLE REPORTS

NOTES

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[illegible]



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