

## Introduction:

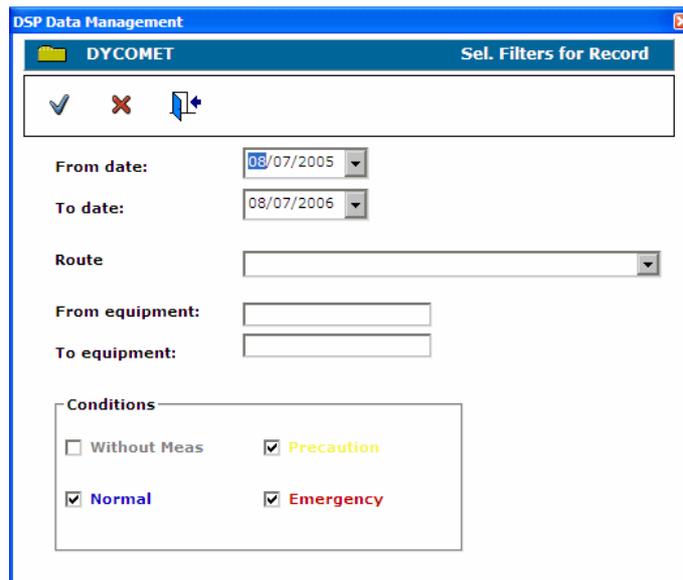
The **Records** application is normally accessed after the plant configuration has been finalized and route and/or off-route measurements have been taken. In the **Records** application one can observe the list(s) of plants, equipment, and measurement values.

Access to the **Records** application is from the main window, after clicking on any existing plant:

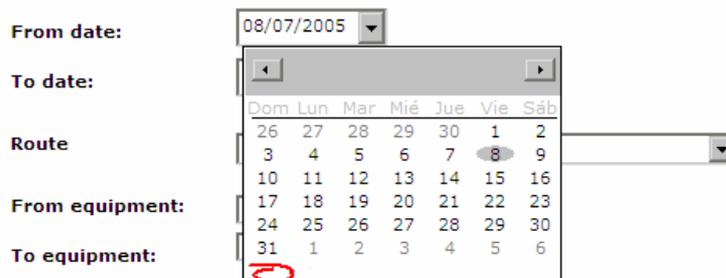


## Searching in Records:

Once a plant has been selected and the **Records** option is clicked, a window opens which allows searching by date, route, equipment, and conditions.



Dates can be easily input by either typing in the MM/DD/YYYY format and/or by using the convenient drop-down calendars.

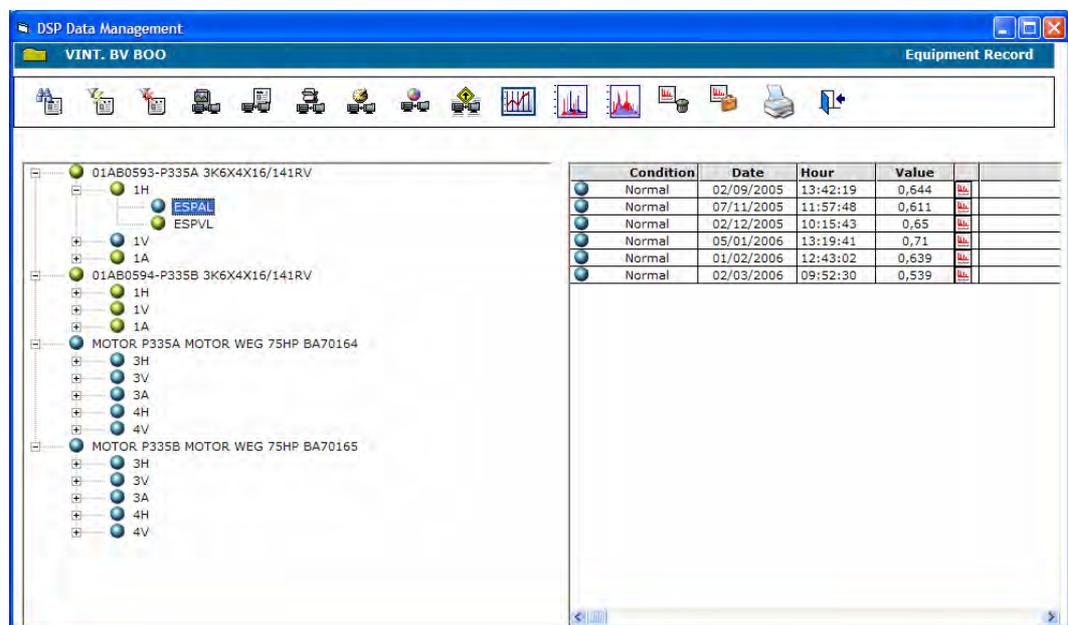


In **Records** it is possible to see the complete history of all equipment, including all points and measurements made.

The filters also allow a lookup of the history for equipment that has not been measured (Without Meas), or equipment that is in Normal, Precaution, or Emergency condition, between any two given dates.

It is also possible to search any equipment by route or to search from one piece of equipment to another.

Once the filter is selected, the Equipment Record window appears. Here is an example:



From this window the user can view the equipment created in the database, as measured over the selected period, as well as the details of the points (including status) and measurements.

### Main Functions of the RECORDS Menu:

-  ICON to search equipment in the Records database.

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-  ICON to filter equipment in the Records database.

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-  ICON to deactivate any selected filter.

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-  ICON to access the image associated with the equipment.

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-  ICON to access the document associated with the equipment.

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-  ICON to access the comment history for any selected equipment, and to add comments

	ICON to open the global measurements window for the equipment.
	ICON to see the state of all plant equipment in a pie chart.
	ICON to select equipment with increased vibration values.
	ICON to view the global value trend chart for a measurement point.
	ICON to view a 3-D chart which compares multiple measurement points in cascade format.
	ICON to view a 2-D chart which compares multiple measurement points.
	ICON to delete measurement records for selected equipment.
	ICON to open measurement briefcase.
	ICON to print out the record.
	ICON to leave the equipment record.

### Status Condition of Measurements:

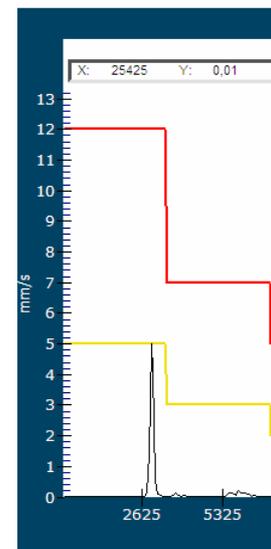
The DSP Data Management software has an alarm system associated with the status condition of equipment, points, and measurements. The status is shown by alarm masks which are composed of two values: one for PRECAUTION and one for EMERGENCY.

The status of a measurement is determined according to the “worst” value.

**Example:** When taking a velocity measurement, the rotational component (or the 1X) of a machine exceeds the PRECAUTION limit in that frequency; however, the first harmonic (the 2X) exceeds the EMERGENCY limit. Therefore, the condition or state of the measurement will be **EMERGENCY**.

If no component exceeds the limits of PRECAUTION or EMERGENCY, the condition of the measurement will be **NORMAL**.

In the spectrum, the PRECAUTION limit is identified by a yellow line, and the EMERGENCY limit by a red line.

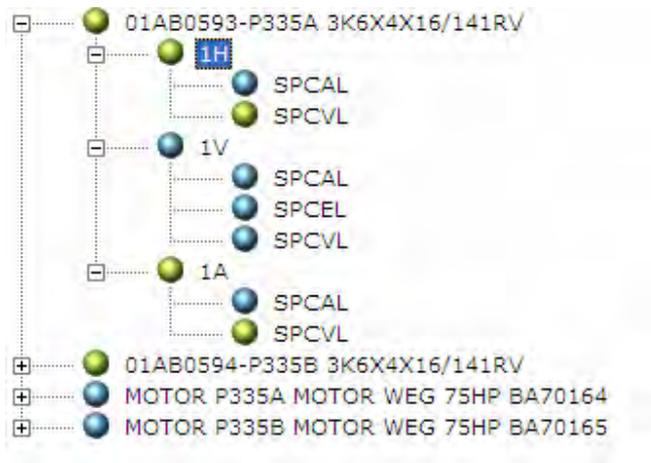


Exact PRECAUTION and EMERGENCY values are visible in the upper bar of a spectrum graph (as shown below). When the cursor is moved over any spectrum graph, these values will correspond to the current position of the cursor.

X: 25425	Y: 0,01	Warning 2,00	Emergency 5,00
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The state of any measurement will be identified by various colors:

**Normal : Blue    Warning : Yellow    Emergency : Red**



Any listed equipment on which measurements have not been taken will be identified in gray.

The status of the measurement and its associated date, hour, and global value will be shown for all equipment. For measurements that have a spectrum graph, a graph symbol will be displayed. When this symbol is clicked, the spectrum graph will appear.

### Equipment Record - Comparison of Spectra:

Being able to compare spectra is very useful tool because the condition of a point of any equipment over time, or comparing measurements on different equipment, can be demonstrated.

This tool also allows comparing spectra taken from different equipment, but this requires a common process variable be used as a basis for comparison. In such case, the value range of that variable can be selected as well.

The procedure for working with this application is as follows:

For measurements on any selected point, double click in the dates. Once the measurements have been selected, one must choose the method of comparison.

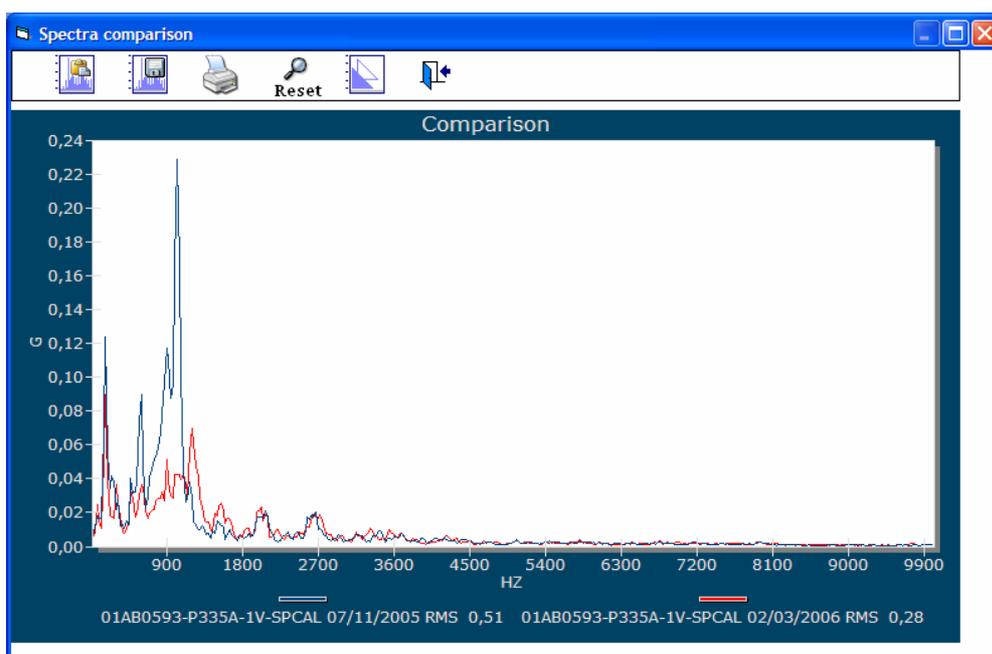
	Condition	Date	Hour	Value		
	Normal	02/09/2005	13:42:29	0,338		
	Normal	07/11/2005	11:57:54	0,511		
	Normal	02/12/2005	10:15:51	0,323		
	Normal	05/01/2006	13:19:48	0,344		
	Normal	01/02/2006	12:43:09	0,383		
	Normal	02/03/2006	09:52:40	0,275		

The software offers the following two comparison options:

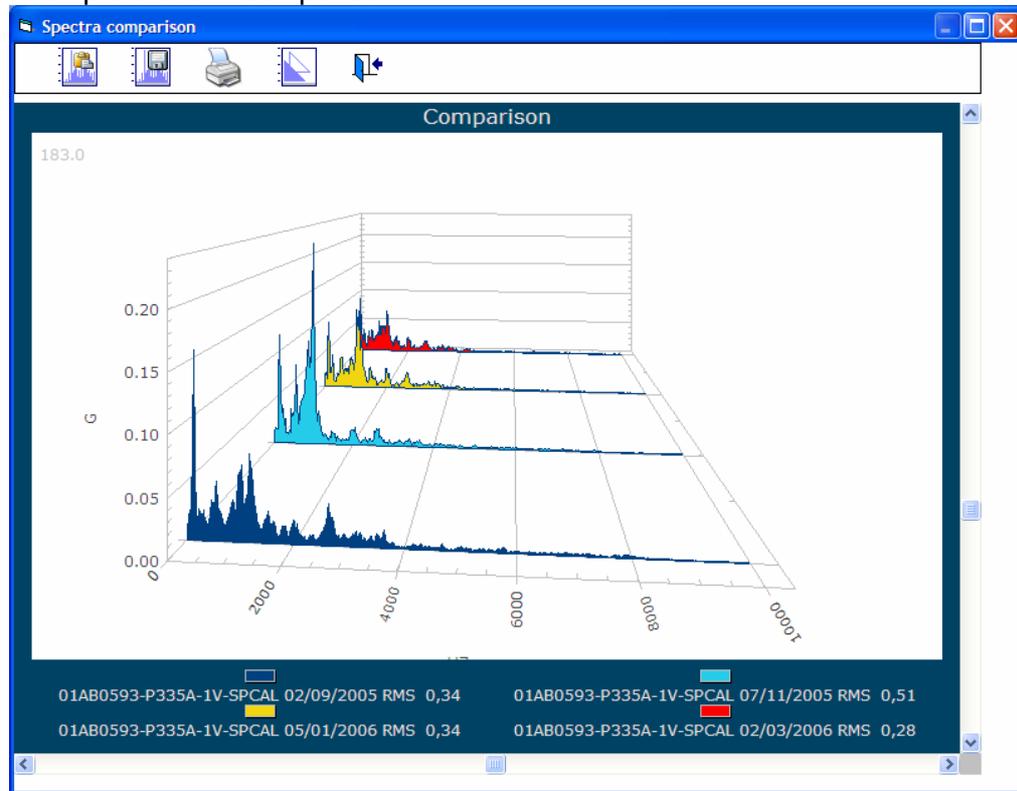
2-dimension:

3-dimension:

Example of a 2-D Comparison:



Example of a 3-D Comparison:



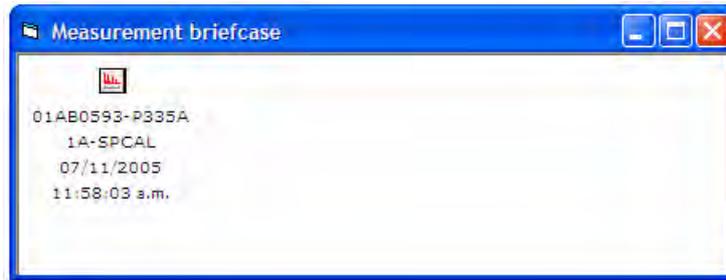
To compare different points of any equipment, or to compare points on different equipment, the software offers a **Briefcase**, into which the user can select and save the points to be compared.

The first point entered into the briefcase serves as a basis for comparison. Additional points are filtered automatically to determine if they are compatible with the first point.

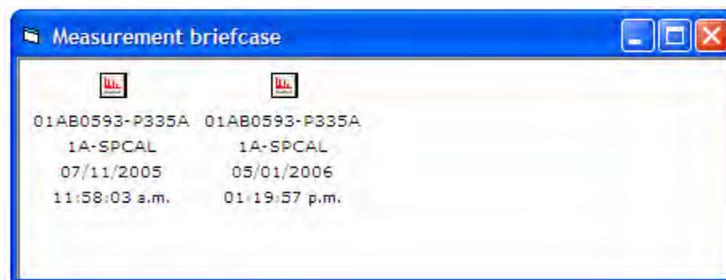
To activate the briefcase, right-click on the date of the measurement record and click on the “Add to case” command.

	Condition	Date	Hour	Value	
	Normal	02/09/2005	13:46:22	0,427	
	Normal	07/11/2005	11:19:51	0,167	
	Normal	02/12/2005	10:19:28	0,408	
	Normal	05/01/2006	12:00:07	0,34	
	Normal	01/02/2006	12:00:07	0,397	
	Normal	02/03/2006	09:56:02	0,29	

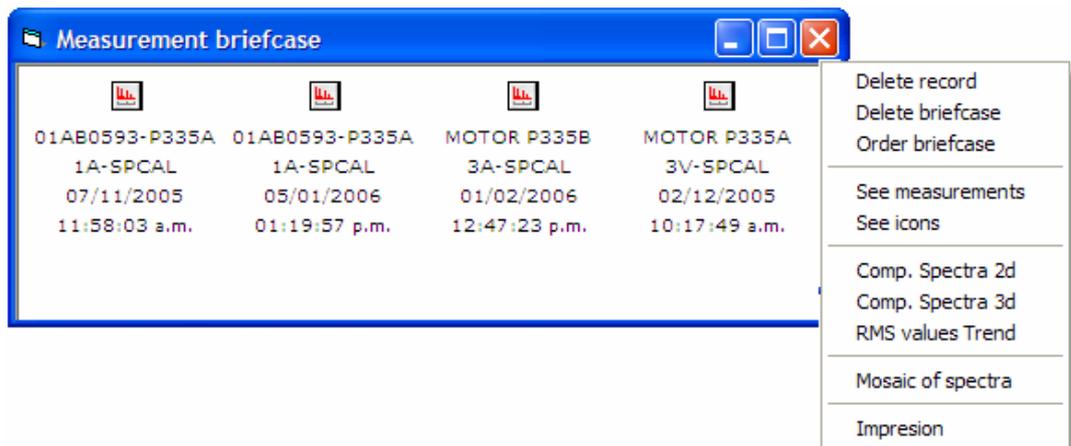
A window called “Measurement case” will open up and show that the measurement has been added to the briefcase.



Once multiple measurements are added to the briefcase, the 2-D and 3-D comparison functions can be used.



The briefcase functions are activated using the right-hand mouse button:

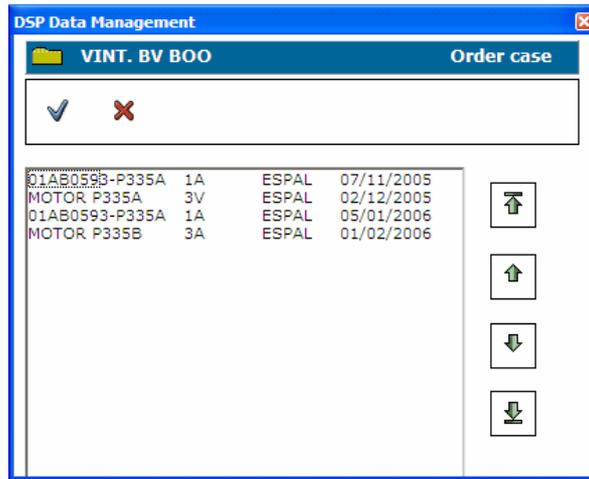


**Briefcase Functions for Measurements:**

**Delete record:** deletes selected measurement from the briefcase.

**Delete case:** deletes all contents of the briefcase.

**Order case:** allows order of briefcase contents to be re-arranged.



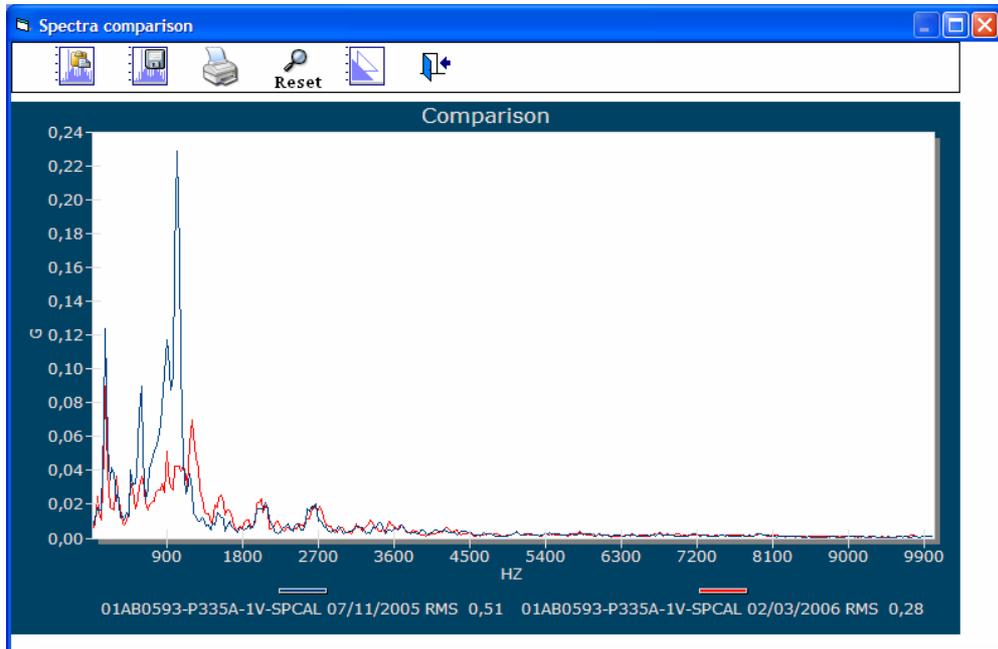
**See measurements:** Displays details of the briefcase contents in a matrix.

	Equipment	Point	Measurement	Date	Hour	Valor
▶	01AB0593-P335A	1A	SPCAL	07/11/2005	11:58:03 a.m.	0,765
	01AB0593-P335A	1A	SPCAL	05/01/2006	01:19:57 p.m.	0,586
	MOTOR P335B	3A	SPCAL	01/02/2006	12:47:23 p.m.	0,241
	MOTOR P335A	3V	SPCAL	02/12/2005	10:17:49 a.m.	0,137

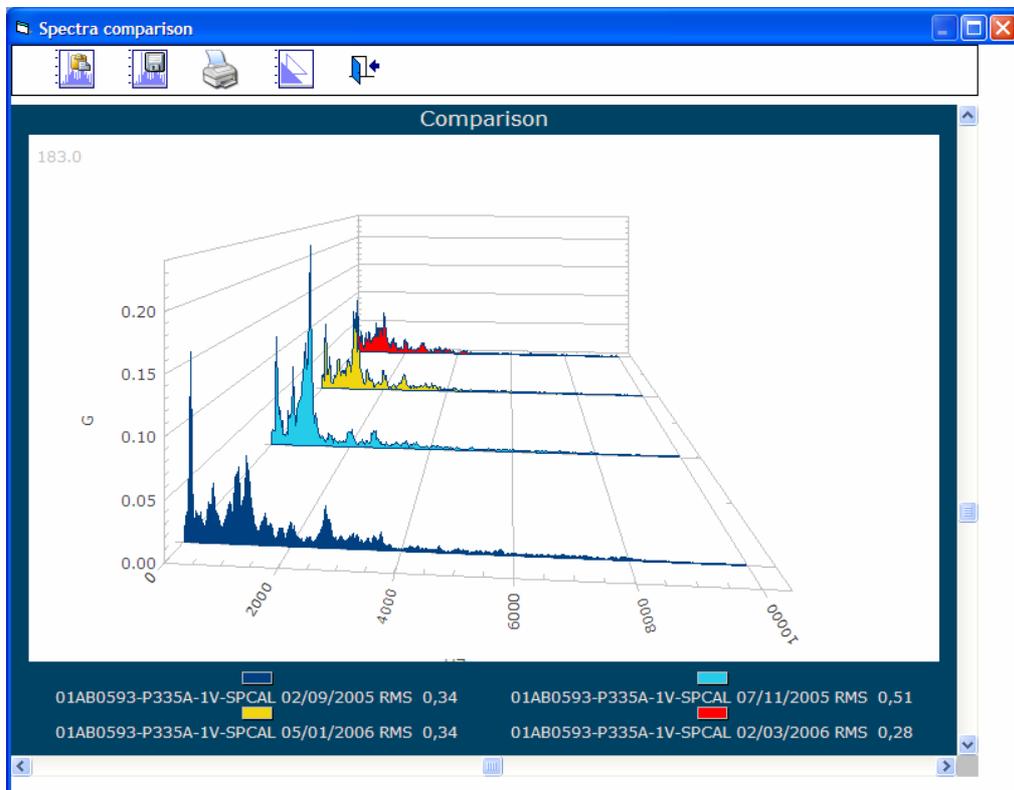
**See icons:** Displays details of briefcase contents as icons, with color differentiation the various type of measurements.

Icon	Equipment	Point	Measurement	Date	Hour
	01AB0593-P335A	1A-SPCAL	07/11/2005	11:58:03 a.m.	
	01AB0593-P335A	1A-SPCAL	05/01/2006	01:19:57 p.m.	
	MOTOR P335B	3A-SPCAL	01/02/2006	12:47:23 p.m.	
	MOTOR P335A	3V-SPCAL	02/12/2005	10:17:49 a.m.	

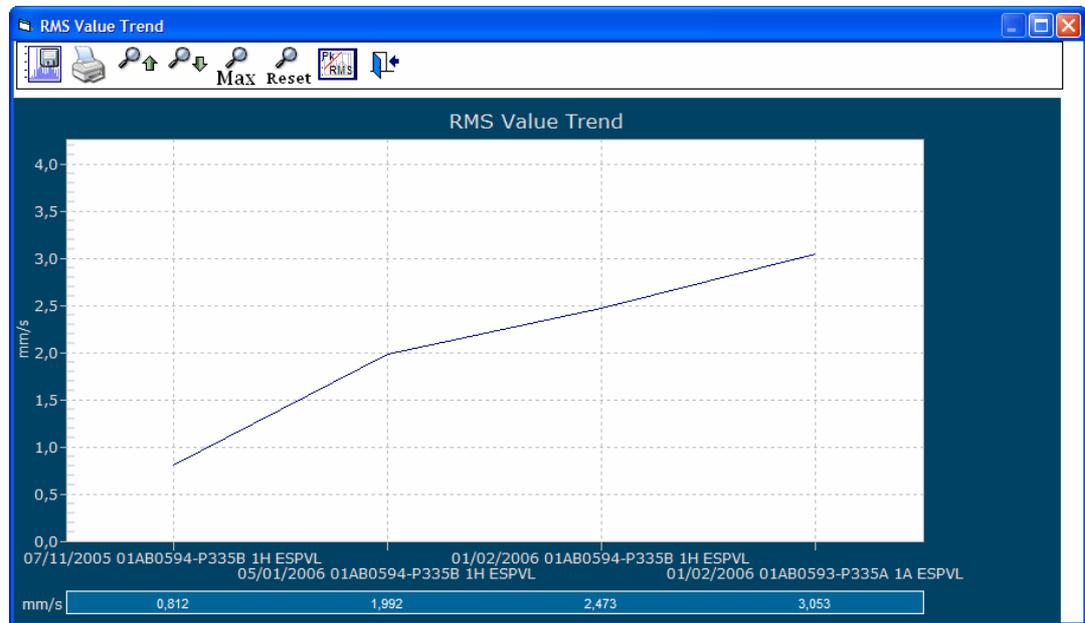
**Compare spectra 2-D:** shows the briefcase contents as spectra in two dimensions, and in the order selected.



**Compare spectra in 3-D:** shows the briefcase contents as spectra in three dimensions, and in the order selected.



**RMS Values Tendency:** selecting this option shows the RMS vibration values associated with the spectral measures stored in the briefcase. They are shown in a trending graph like this example:



**Tools for spectra comparison graphs:**

There are several tools available for analysis of the spectra comparison graphs, for work in both 2-D and 3-D. These tools are located in the upper zone of the Spectra Comparison window:



Click this icon to copy the image of the comparison to the clipboard, to paste into other applications such as Word, Excel, etc.



Click this icon to save the comparison as a JPG image. The file will be stored in the folder corresponding to the Plant.



Click this icon to shade (and un-shade) the area between graphic lines and the x-axis.

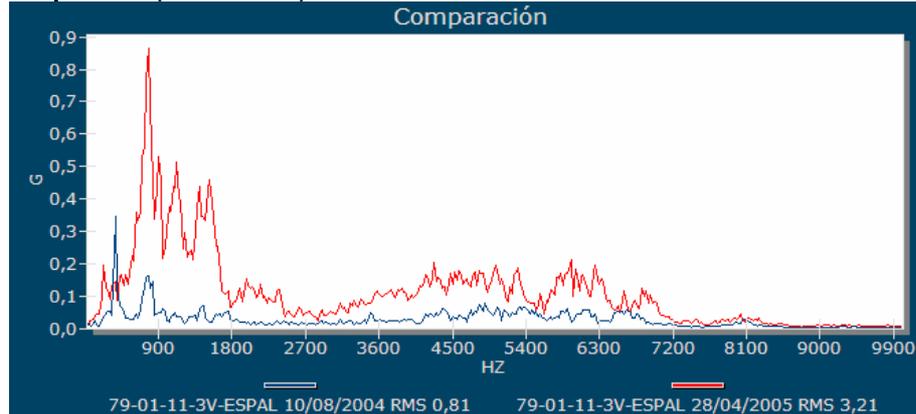


Click this icon to print the spectral graphic as viewed onscreen.

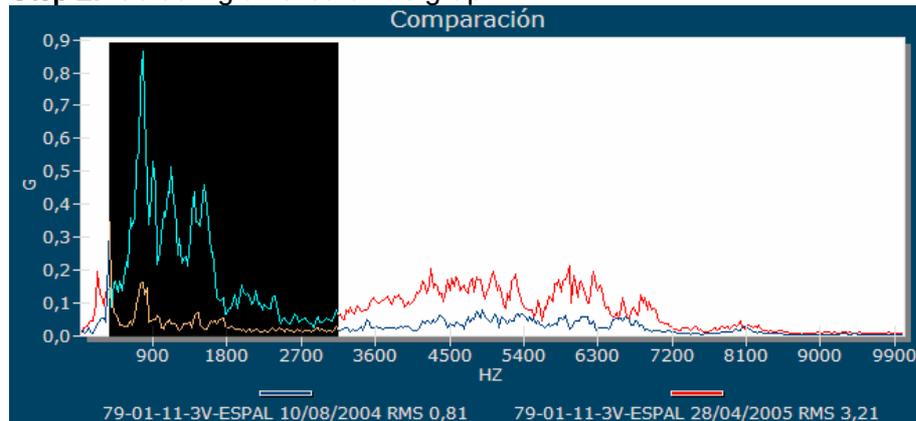
**2-D Graphic Functions:**

When viewing a spectra comparison in 2-D, there is an unlimited ZOOM tool available. To use it, press and hold the left-hand mouse button to select an area of the graph. The selection will then increase in size to fill the graph, which allows more detailed viewing.

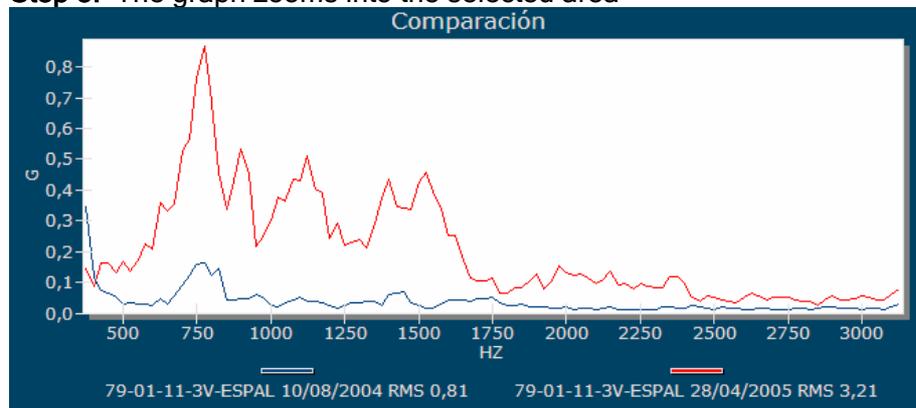
**Step 1: A spectra comparison in 2-D**



**Step 2: Selecting an area of the graph**



**Step 3: The graph zooms into the selected area**



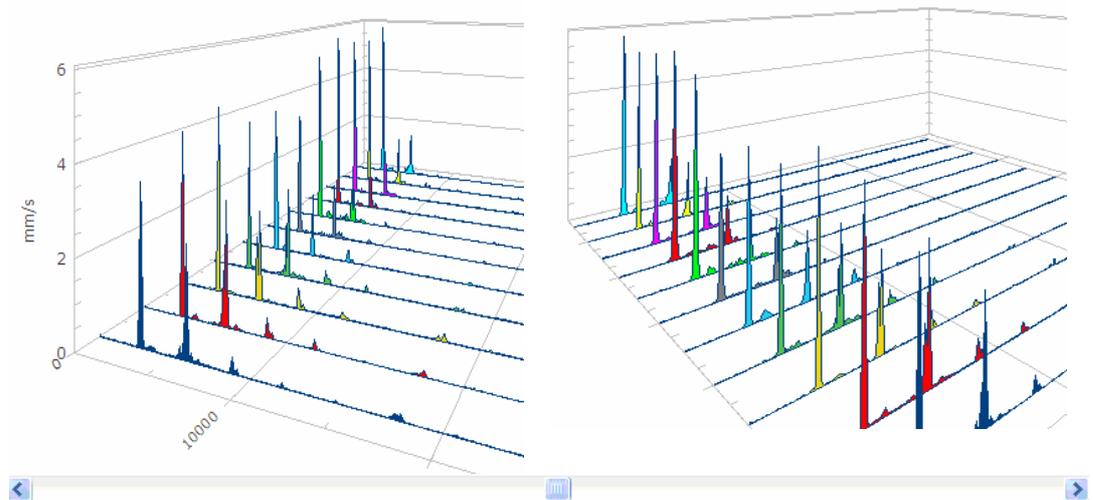
To restore the original graph, click on this icon:



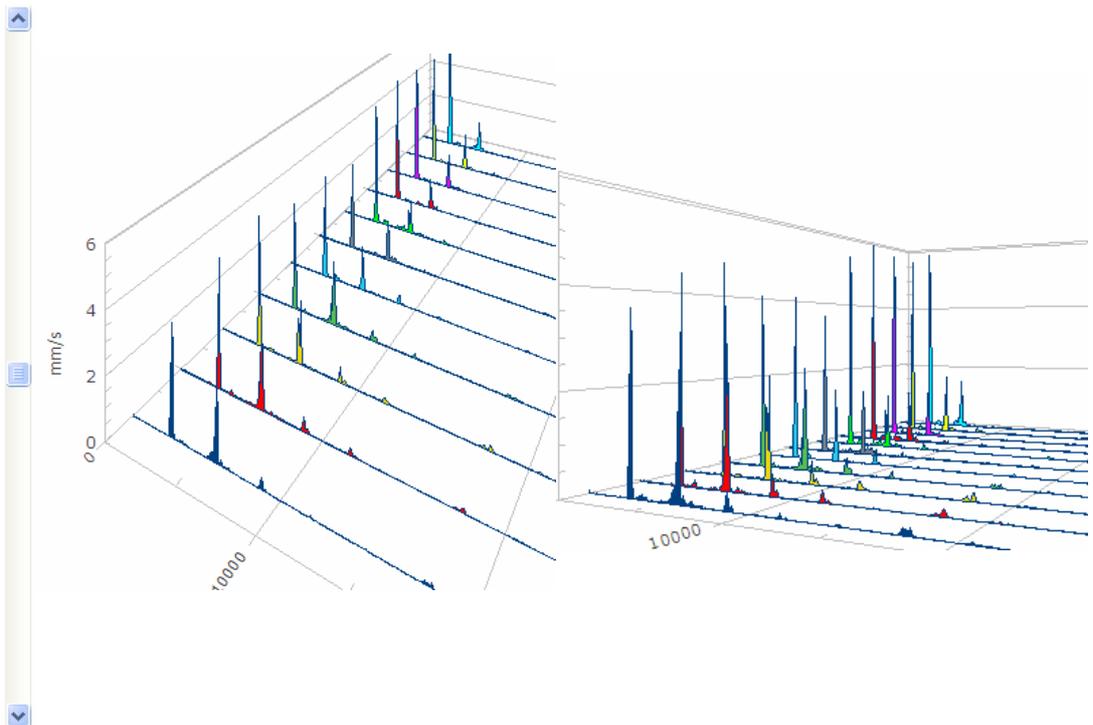
**3-D Graphic Functions:**

When viewing a spectra comparison in 3-D, many different spectra are visible, which may be confusing and may conceal a particular component. To eliminate this problem, the view of the 3-D graph can be rotated horizontally and vertically by using the scroll bars which appear on the right and bottom sides of the graph.

Movements using the horizontal scroll bar



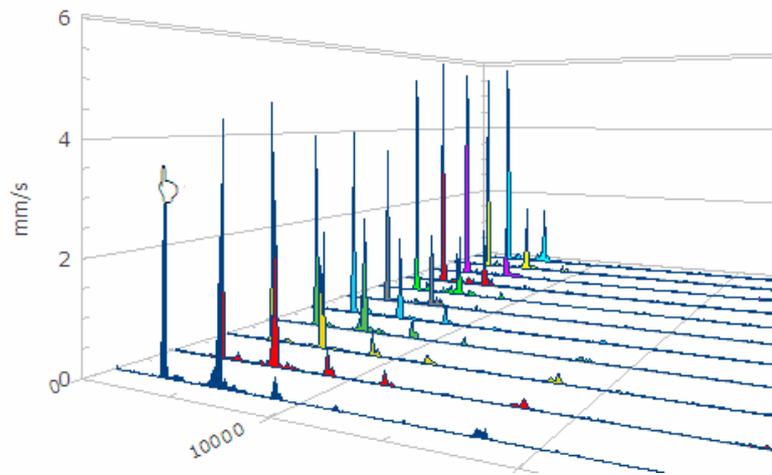
Movements with the vertical scroll bar



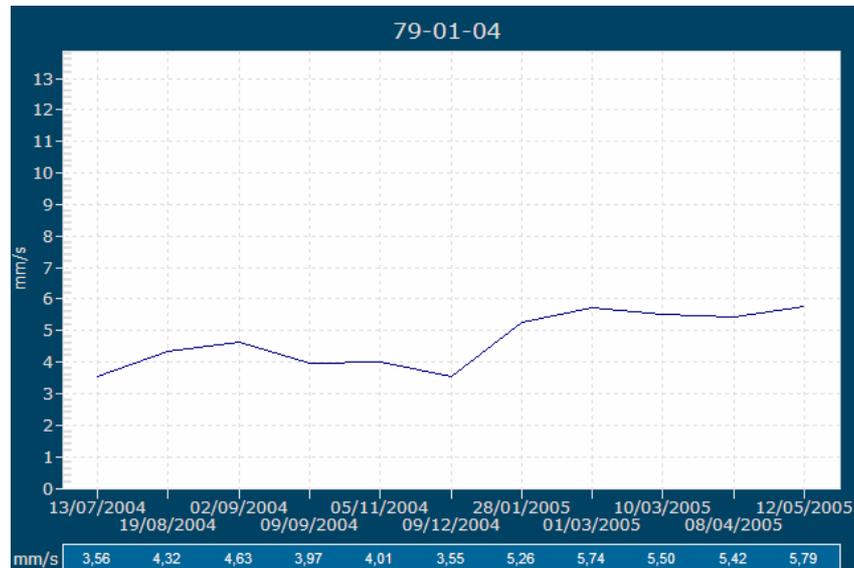
In addition to adjusting the movements with the scroll bars, automatic 360° rotation of the graphic is activated by double-clicking the image of the graph. Double-clicking again will stop the rotation.

**Trend of any spectral component:**

For both 2-D and 3-D spectra comparison graphs, the user can access a graph of any specific frequency component to see the component's trend over time. To access such a graph, the user will position the cursor at the peak of any component, as shown here:



By double-clicking on the component, a graph will open to show the different levels of that component found on each of the spectra:



**Tendency Graphs:**

Tools are available to clarify or highlight the vibration values shown in the tendency graphs. These tools apply to all tendency graphs for any value or program function.



Click on the above ICON to print out the tendency graph.



Click on the above ICONS to increase or decrease the amplitude axis range in order to more clearly see the trend data.



This function maximizes the amplitude scale of the graph.



Resets the graph settings to their original states.



Clicking this function allows a comparison of the measurement values to the severity levels defined in ISO Standard 10816-3. For this it is necessary that global and spectral measurements be made in **velocity**, as the system checks the RMS measurement values against the ISO Standard. The proper operation of this tool depends of the equipment configuration (see chapter 2). If the equipment was not configured to any group listed in the Standard, the software will require assignment to a listed group.

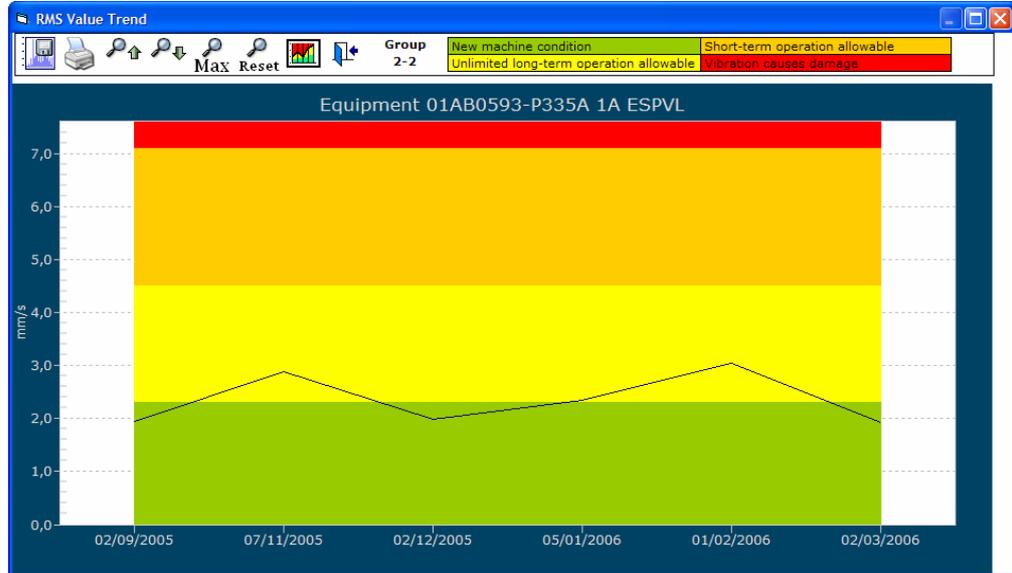
This tool compares only RMS values in velocity. To compare values of acceleration and envelope, standard values obtained from historical measurements are used as reference.

It is recommended that these values be considered as merely informative. In all cases, the operating speed of the equipment under test must be the main factor to consider.

**Values and Velocity References:**

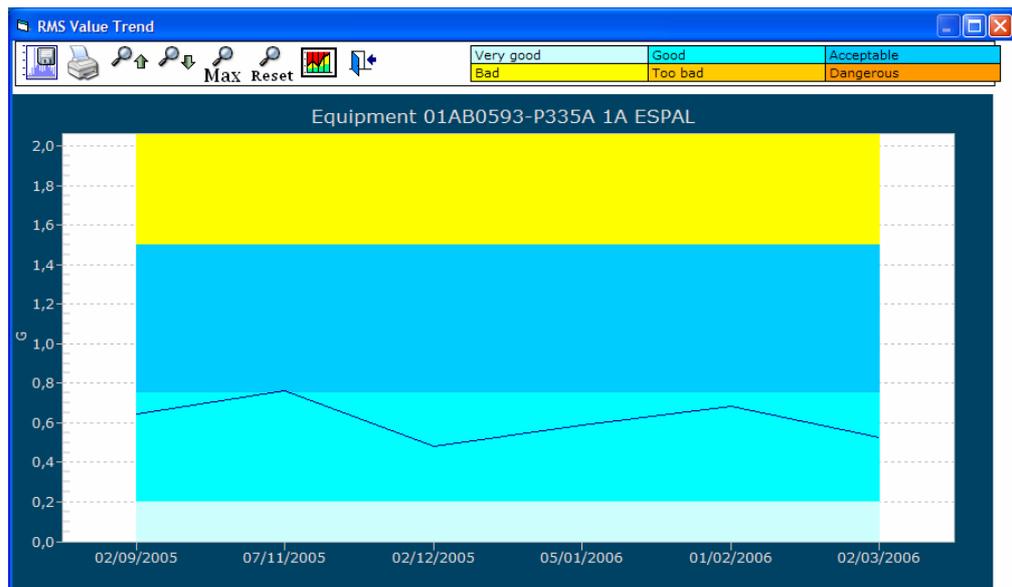
Vibration causes damage		Red
Short-term operation allowable		Orange
Unlimited long-term operation allowable		Yellow
New machine condition		Green

The severity levels of ISO 10816-3 which corresponding to the equipment will be shown in the left side of the of the table.



Values and References for Acceleration and Envelope:

Dangerous	Orange	Orange
Very Bad	Light orange	Light orange
Bad	Yellow	Yellow
Acceptable	Sky blue	Sky blue
Good	Turquoise	Turquoise
Very Good	Light Turquoise	Light Turquoise



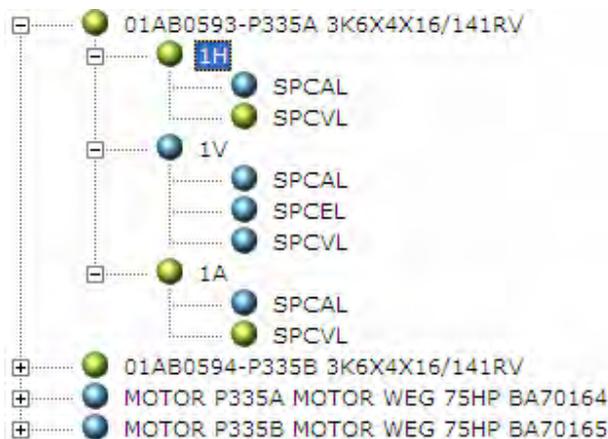
**Tendency Graphs for Spectra RMS Values:**

The tendency graphs are oriented to indicate only global values for RMS, 0 to Peak and Peak to Peak. However, if only spectra exist in the equipment records, the system will search for their RMS values and display their evolution over time.

Both measurements are shown graphically using this command:



The first step is to locate the equipment and the point in the Record window. Next, click on the graph icon, and the system will display it.



	Condition	Date	Hour	Value		
	Normal	02/09/2005	13:42:29	0,338		
	Normal	07/11/2005	11:57:54	0,511		
	Normal	02/12/2005	10:15:51	0,323		
	Normal	05/01/2006	13:19:48	0,344		
	Normal	01/02/2006	12:43:09	0,383		
	Normal	02/03/2006	09:52:40	0,275		

**Graphics of Spectra:**

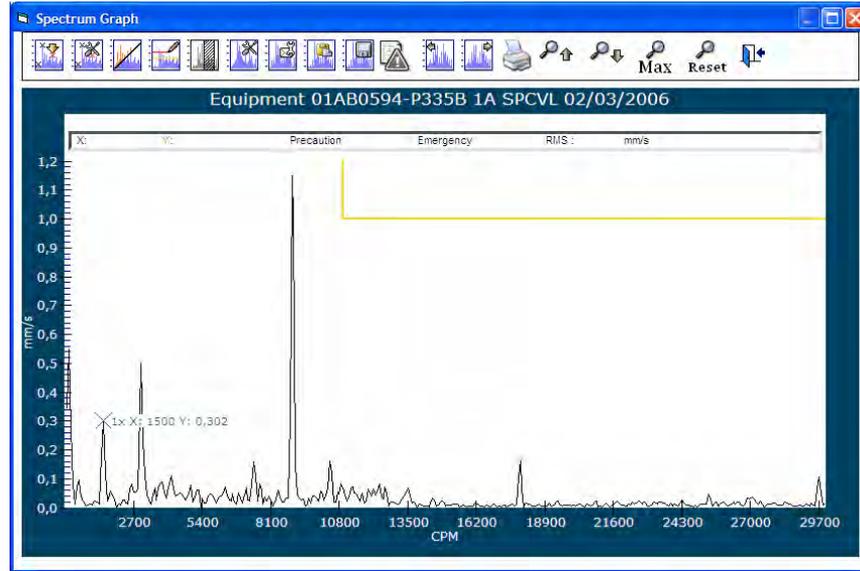
The spectra graphs are 2-D diagrams of RMS amplitude vs frequency. The amplitude and frequency shown are related with each measurement and fixed for each variable.

Variable	Amplitude	Frequency
Acceleration	g	Hz/ CPM
Velocity	mm/sec	Hz/ CPM
Velocity	In/sec	Hz/ CPM
Displacement	μ	Hz
Envelope	g	Hz
Electric Current	Amperes	Hz
Auxiliary	Amplitude	Hz
Ultrasonics	dB	Hz

The tools applied to spectra give cursors with positions in both axes, which are always shown in the spectrum.

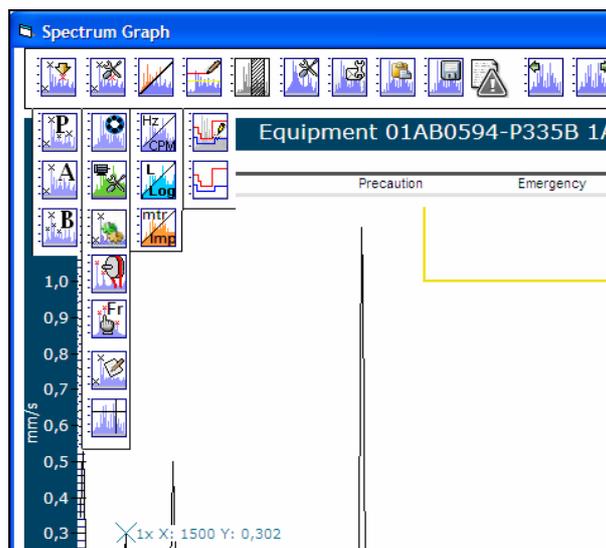
**Analysis Tools:**

Once the spectra window is open, the cursor may be located on any component, activating it by clicking the mouse.



Once the cursor is selected, the tools located in the upper zone of the window become available. These tools are arranged according to function and can be found via a drop-down menu that appears when the cursor is positioned over the reference ICON.

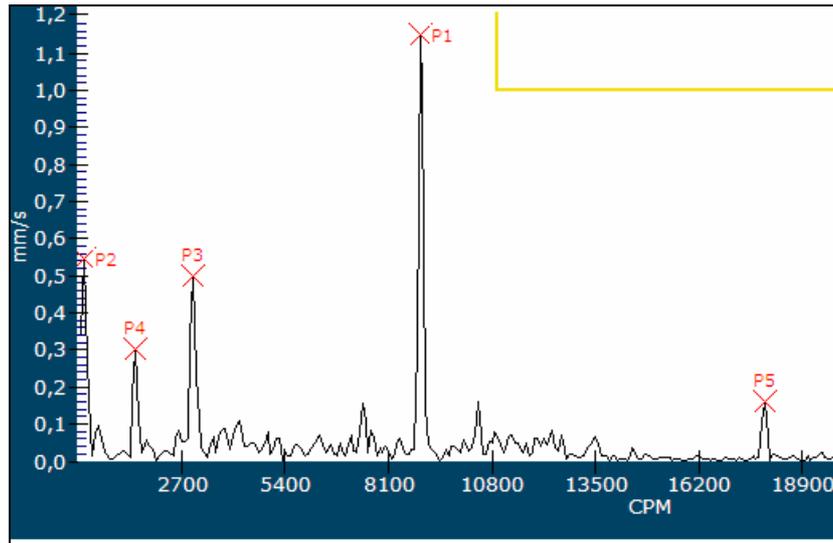
The following figure shows all functions corresponding to the main ICONS in the upper bar (all drop-down menus are visible):





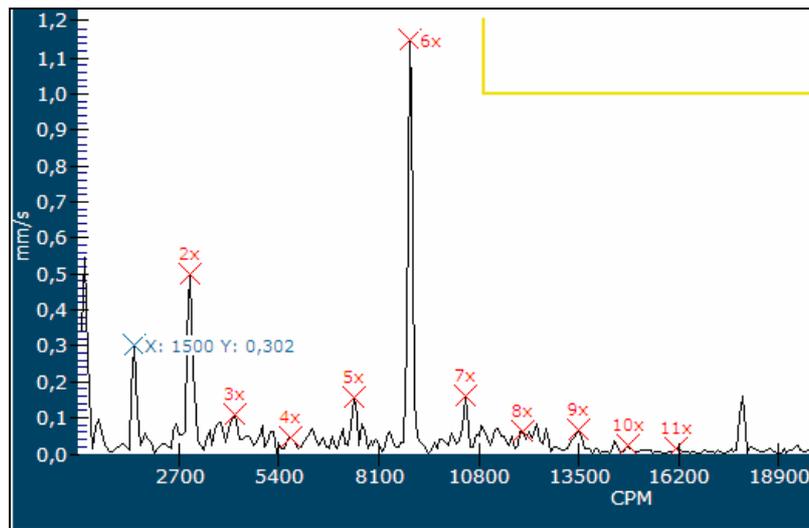
MAXIMUM PEAKS

With the spectrum graph open, this tool locates and indicates the maximum peaks in the spectrum.



HARMONICS

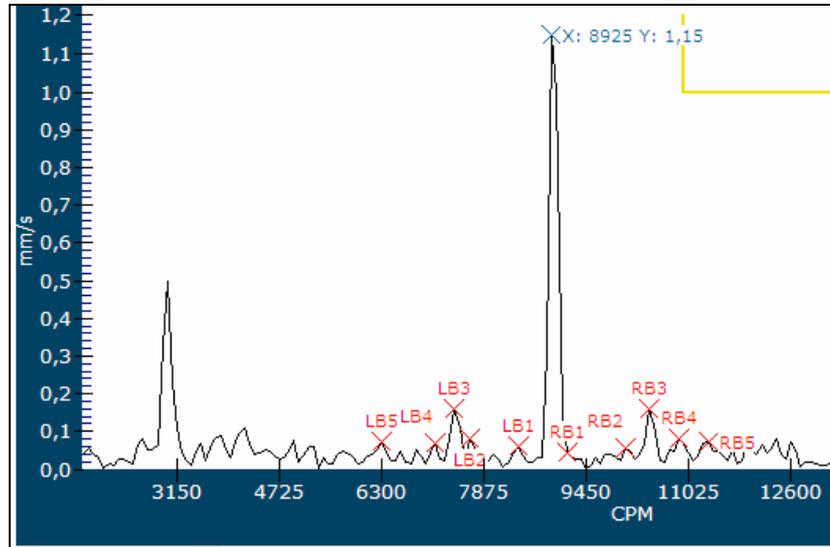
Once a specific component is selected, this tool will indicate its harmonics.





**SIDEBANDS**

Once a component is selected, this tool displays both sidebands of the component, taking into account the configured separation.



**Main ICON of Analysis Tools**

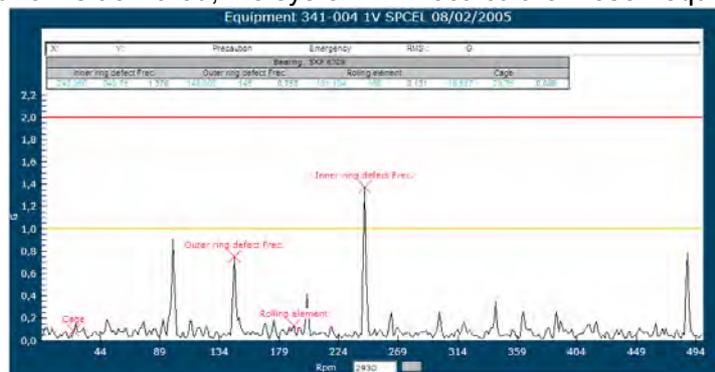


**BEARING FAULTS**

This tool activates the searching for fault frequencies corresponding to the configured bearing of the measurement point. This tool is only available for the following spectra:

- Envelope: **SPCEL, SPCEM, SPCEH**
- Velocity: **SPCVM, SPCVH**
- Acceleration: **SPCAL, SPCAM, SPCAH**

The bearing fault frequencies will be identified in the graph. These frequencies are computed based on machine running speeds (RPM) configured in the points. If the RPM values differ during measurement, the actual value will have to be entered. When the button is activated, the system will recalculate these frequencies.



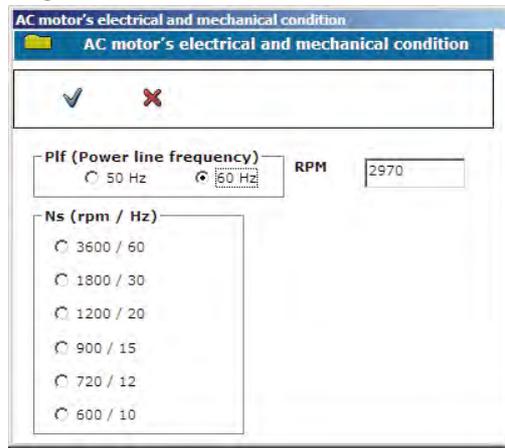
**Harmonics Function:**

When activated, shows the harmonics found in the spectrum that correspond to each fault frequency.



**ANALYSIS OF CURRENT AND CORRECTIVE ACTIONS**

This function only works in spectra of electric current measured with an apermometric clamp (current clamp). The analysis of the status of a motor is made automatically providing the operator knows and has input the data required by the software. All of the data is required and only correct data will ensure an accurate diagnosis.



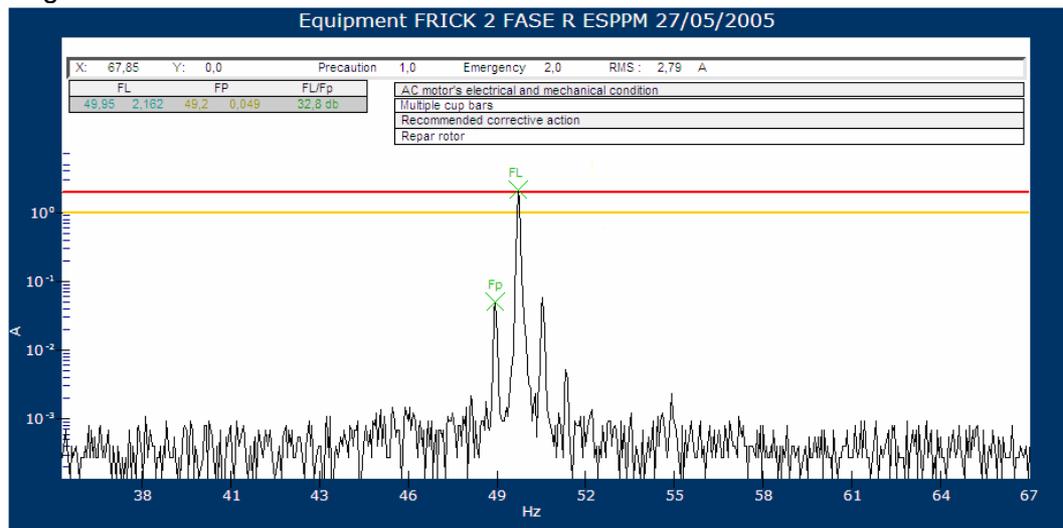
**FL:** The line frequency supplying the motor needs to be selected.

**Ns:** The synchronous speed of the motor needs to be selected, so the software can calculate the pole-pass frequency.

**RPM:** Entering the running speed of the motor is a vital factor to obtain accurate results.

The exact value of the motor's RPM at the time of measurement must be entered for the software to analyze with accuracy. The RPM may be measured using electronic tachometers, or by computing the RPM using a spectrum of at least 4,000 lines and maximum low frequency.

Once all data required by the system have been entered, this tool's automatic functions will identify in the spectrum the line frequency and pole-pass frequency, calculate the difference in amplitude between them in dB, and deliver a precise diagnosis.



Inside the spectrum, the calculated values will be shown in a chart or table, like this:

FL	FP	Razón FL/Fp
49,95	22,235	49,15 0,467 33,6 db

The software will also show its recommendations and suggestions that correspond to the tolerance table:

AC motor's electrical and mechanical condition
Multiple cup bars
Recommended corrective action
Repar rotor

Whenever the analysis and electrical condition function is active, the analyzed spectrum can be seen without zoom and in linear scale, but via zoom functions accessed by right-clicking the mouse and selecting a window, it is possible to enlarge a sector and observe its details. Additionally, by activating the logarithmic scale function with the ICON shown below, the smaller peaks can be seen with better definition, and they can be compared with the dominant peak (which generally coincides with the line frequency).



LF/PPF	Evaluation of Rotor Condition	Recommended Corrective Action
≥ 60 dB	Excellent	None
54-60 dB	Good	None
48-54 dB	Acceptable	Continuing surveillance of tendency only.
42-48 dB	Small cracks may be developing in the rotor bars or high-strength joints.	Shorten intervals between surveillance and trending.
36-42 dB	Two bars likely broken or cracked, and/or problems in high-strength joints.	Perform vibration testing to confirm origin and severity of problem.
30-36 dB	Multiple bars and end rings broken or cracked. Problems in end rings and broken joints also likely.	Repair rotor.
≤ 32 dB	Severe problems with broken bars and end rings likely, extending to the entire rotor.	Repair or replace rotor.



### GEARMESH FREQUENCY CURSOR

Vibration arising from problems in gears are easily identified because normally they appear at the gearmesh frequency (the number of gear teeth multiplied by the RPM of the gear shaft).

Typical gear problems that produce vibrations with the gearmesh frequency: excessive wearing of teeth, lubrication failures, in coincidence between teeth, and foreign particles between teeth.

To determine these frequencies and their harmonics, it is only necessary to enter the required data in the configuration window of that tool.

Gear	RPM	Tooth gear quantity	Harm
Gf ( Gear frequency)1	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>
Gf ( Gear frequency)2	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>
Gf ( Gear frequency)3	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>
Gf ( Gear frequency)4	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>
Gf ( Gear frequency)5	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>

Each gear may be identified by a specific name. The software can search and analyze the fault frequencies of five (5) gears at a time.



**BELT FREQUENCY MARKER**

V-belts are a source of vibration, especially in machine tools, where vibration levels have to be minimized. The vibration problems associated with belts are:

- 1) Reaction of the belt to other disturbance force in the equipment.
- 2) Vibration caused by actual problems in the belt.

Given that belt vibration is more visible than vibrations on other points of a machine, and that belts are very easy to replace, changing the belt is often undertaken in order to correct a vibration problem.

To discover the frequencies produced by a belt problem, the operator must enter the values required by the software to make the calculations. These frequencies' harmonics will also be visible.

Frequency	pulley RPM	pulley diameter	Belt length (inch)	Harm
Bf ( belt frequency)1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>
Bf ( belt frequency)2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>

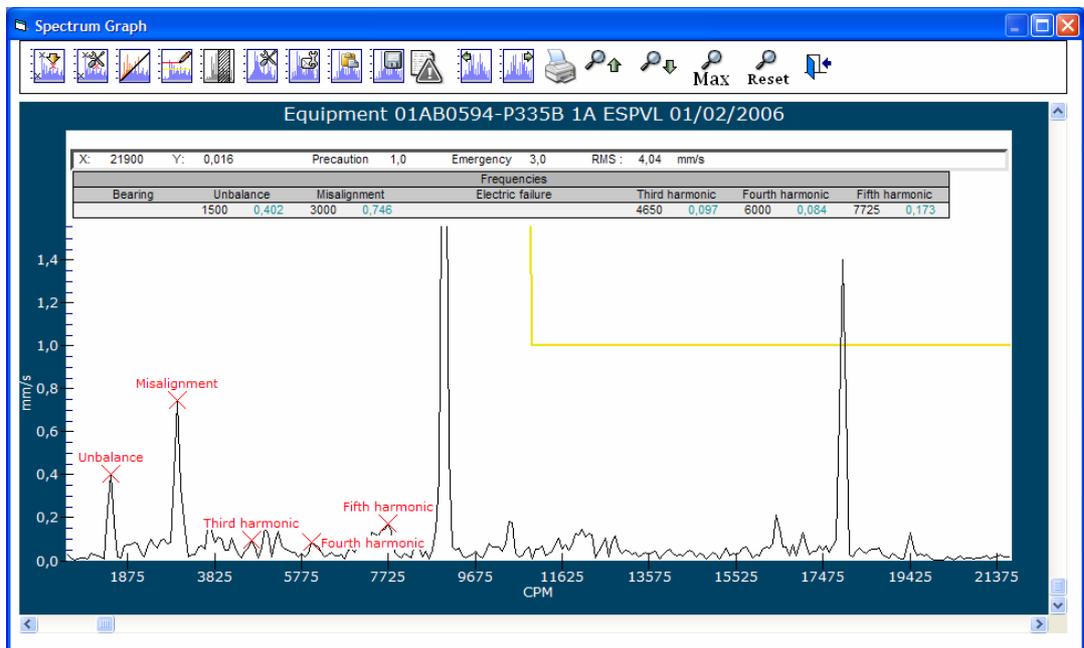
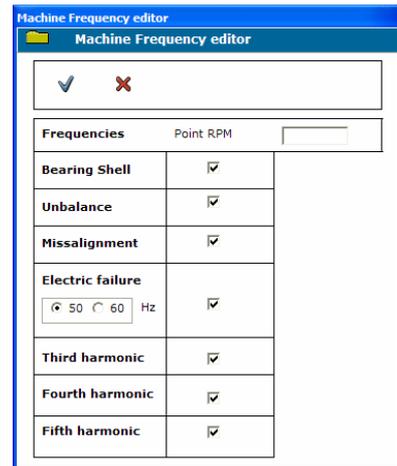
Each belt frequency may be identified by a specific name. The software can search and analyze the fault frequencies of two (2) belts at a time.



**FAULT FREQUENCY MARKER**

The marker of fault frequencies can locate in the spectrum the various frequencies coincide with mechanical or electric faults, taking the machine running speed as the reference. The software will take the RPM as configured in the point. In case this is not configured, the RPM value must be entered manually from the window:

Each frequency indicated in the spectrum may be enabled or disabled from the window. Once the components and other data have been selected and entered, by clicking the button the components will be seen in the spectrum:

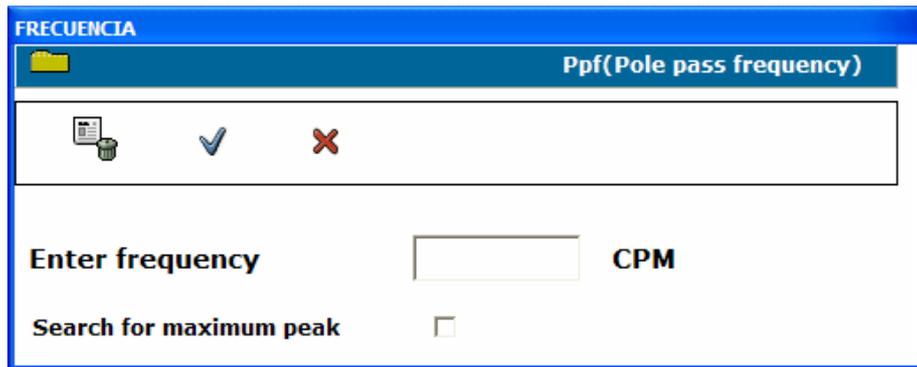




**ENTERING FREQUENCIES & MARKERS IN SPECTRUM**

The frequency marker is useful for locating a specific frequency and finding its amplitude.

For this option, enter the frequency value in the window of this tool, expressed in the corresponding unit (CPM or Hz)

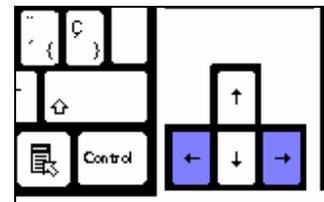


The option for searching maximum peaks activates a setting which allows the software to indicate the maximum peak and thus avoid errors in peak-detection generated by the spectral definition.

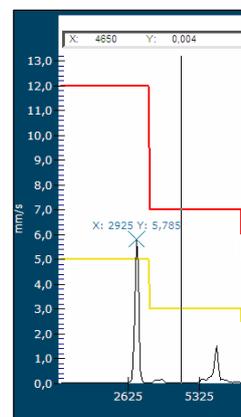
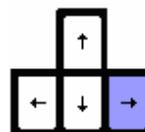
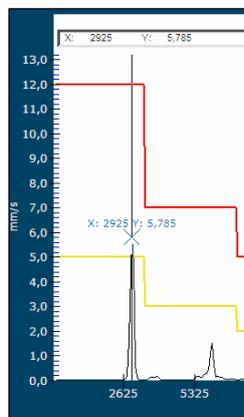


**LINE CURSOR BY STEPS**

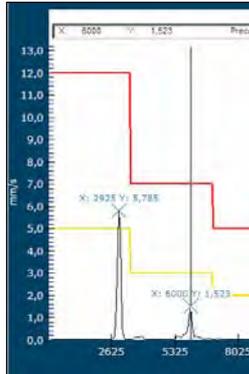
This cursor option draws a vertical line in the graph than can be moved to the right or left by using the arrow keys.



After activated, the vertical cursor appears in the first point of the spectrum. It can be placed close to the zone to be analyzed by simply clicking the left-hand mouse button on any component.



Each time that a point or a component is located inside the spectrum, and is activated by the positioning of the cursor, there will appear a cross showing the frequency and its amplitude.



It is also possible to add a legend or comment to this mark by double-clicking it. The program will open a window to edit the existing legend as shown in the figure:



CHANGING FREQUENCY UNITS

This ICON allows changing the frequency of any spectrum in the system from Hz to CPM. Nevertheless, this change is only temporary, as the default unit depends on the configuration.



CHANGING THE AMPLITUDE SCALE

This ICON allows changing the scale of amplitude in any spectrum, selecting either the LINEAR or the LOGARITHMIC scale.

The logarithmic scale may be useful when several components are similar in size and hard to distinguish. In vibrating machines, the early signs of bearing failures are signals of very small amplitude.

To establish a trend for levels of these components, it is better to track the logarithm of the amplitude instead of the amplitude itself. By doing this, one can view and interpret visually a dynamic range of least 5000 to 1, which is a bigger range - over 100 times larger! - than what one can see in a linear scale.

In a logarithmic scale, the amplification of signal level implies an addition. This means that if the amount of amplification applied to a vibration signal is changed, this change will not affect the shape of the spectrum.



**CHANGE OF SYSTEM OF SPECTRA MEASUREMENTS**

Using this ICON, it is possible to change the y-axis amplitude units in VELOCITY spectra, however defined, from the METRIC system to the ENGLISH system.

Velocity Measurements:

METRIC : mm/sec

ENGLISH : inches/sec



**Main ICON for editing alarms in the spectrum**



**EDIT ALARM MASKS**

When this button is pressed, a window opens to display the amplitude and frequency values configured for that mask.

The pre-configured spectral alarms can be changed after observation of the spectral graph and seeing how the components may interfere with the alarm line settings.

This is a very important tool to optimize the system and to ensure that early predictions of failures are successful. This novel and practical way to change the alarms while viewing the measured spectrum allows making more precise adjustments of the components.

**Frequency in**

**Range in mm/s**

**% Updating**

There are two ways to change a mask:

If the mask is configured correctly for the components, but the amplitude is suitable, changes can be made to increase or decrease the amplitude in steps of 10% of the existing alarm value.

In cases where the mask is unsuitable in both frequency and amplitude aspects, the user can fill in the tables with desired alarm values, and press this ICON to see the results.



DSP Data Management

Alarms updating

✓
✗

	RMS range		
	Max. Freq.	Precaution	Emergency
1	3975	7	16
2	7950	3,5	8
3	10950	2	5
4	30000	1	3
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0

Freq in

Range in mm/s

% Updating

These procedures will not affect the status of measurements already taken. The changes will only go into effect for future measurements made with the MX300 data collector.



## DELETE AN ALARM MASK

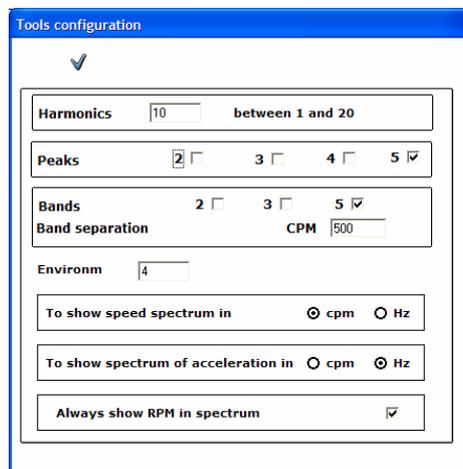
The alarm masks can be deleted when required; for example, in order to print or save an image without masks.



## TOOL CONFIGURATION

It is useful to configure tools that empower the analyst. In cases where values are very similar to each other, the precision of cursors can be adjusted in the settings window. The smaller the interval, the more precise the result.

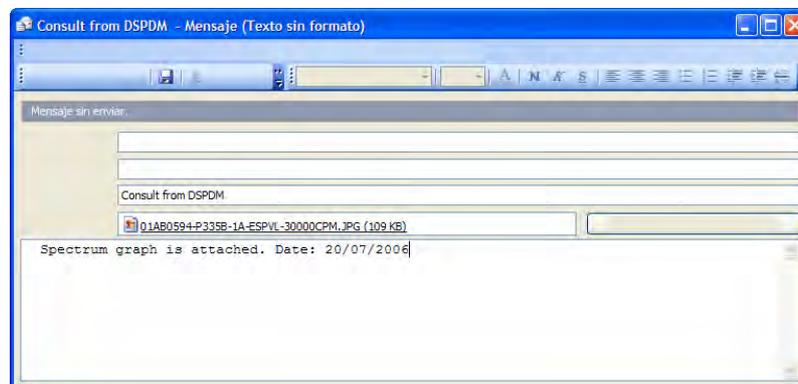
All settings of these tools can be saved and each user can save his own configuration.



## SEND SPECTRUM BY E-MAIL

This option allows attaching the spectrum image to an e-mail message, in order to perform a remote analysis.

The file attached to the e-mail will have data for the type of measurement, lines definition, and maximum frequency.





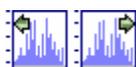
## COPY IMAGE TO CLIPBOARD

This function copies the spectral graph to the clipboard for pasting into another application, like Word, Excel, and so forth.



## SAVE SPECTRUM AS IMAGE

Saves an image of the spectrum into the directory of the plant, with a user-defined name and the "jpg" extension.



## VIEW SPECTRA BY DATE

These two ICONS show the spectra in ascending or descending chronological order, per date of measurement. It is possible to search all measurements of a point without opening each spectrum.



## PRINT



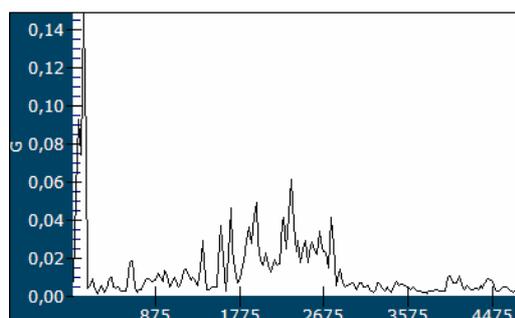
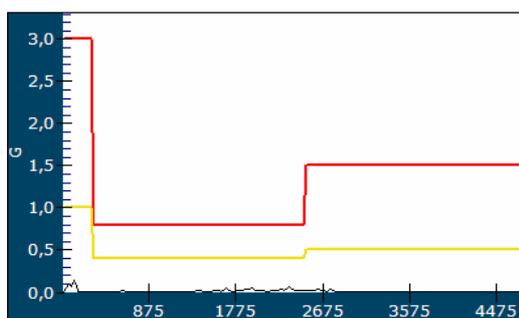
## ZOOM VERTICAL AXIS

Use these icons to increase or decrease the graph's y-axis amplitude values.



## Max MAXIMIZE THE SPECTRUM

This is a function for increasing or decreasing the amplitude in the vertical axis of the spectral graphic. Whenever a graph opens, the software tries to show all series, spectral graphs, and alarms. If the difference in amplitude between the spectral components and alarms is large, it will be very difficult to see the components. In such cases, the **Max** tool can be used to modify the amplitude scale.



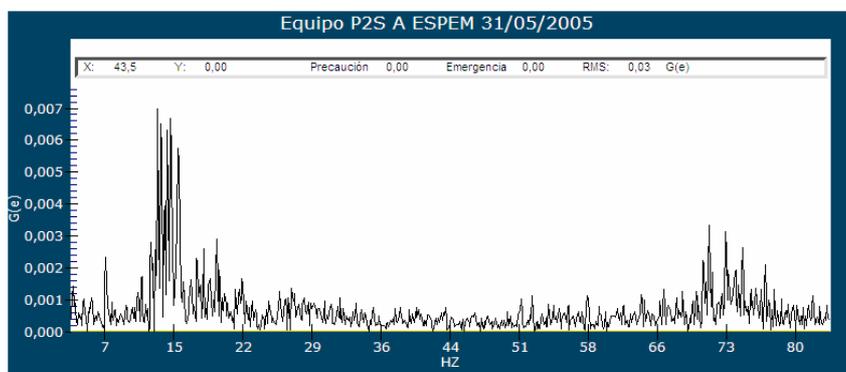
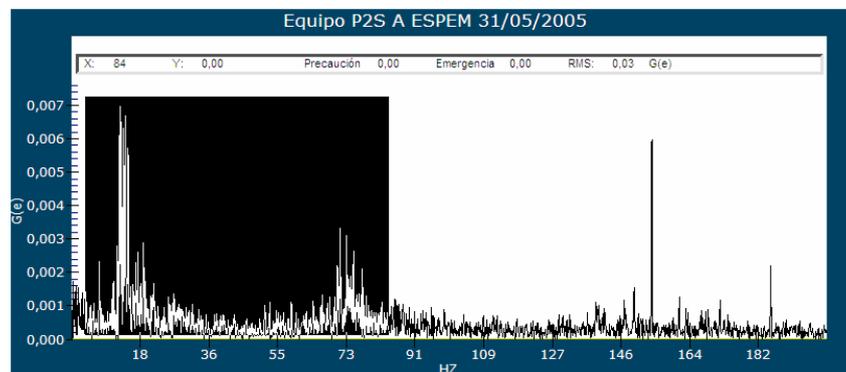
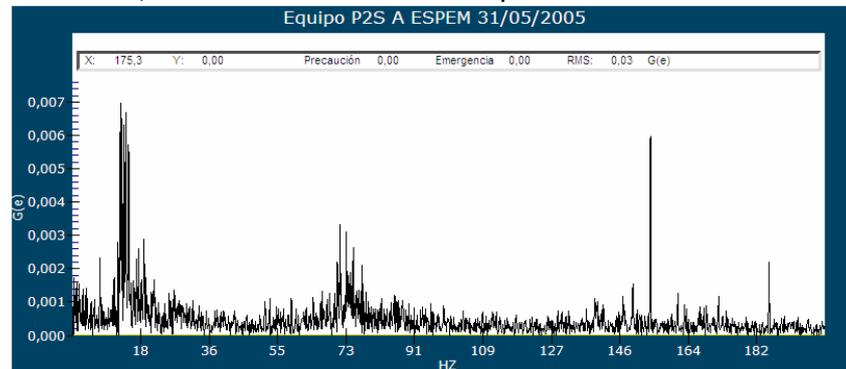
**Reset**

This function resets any zoom adjustments made, returning the graph to all default values and deleting any added pointers or comments. Resetting allows a fresh analysis of the original graph.

**Functions of Zoom in frequency :**

The spectra of the DSP software include Zoom tools for both axes: (amplitude and frequency). Although these tools are available for all spectra, they are recommended for use only on spectra of 2,000 and 4,000 lines. As the steps between frequencies are rather large in spectra of 400 lines, there is a resulting loss of resolution.

To Zoom on frequency, just press and hold the left-hand mouse button and move about the window, to define the zone to be amplified.



**Images and Documents Associated with Equipment:**

When Records are reviewed, images and documents associated with the equipment can be opened using the ICONS for such functions.



ICON to access the image of selected equipment.

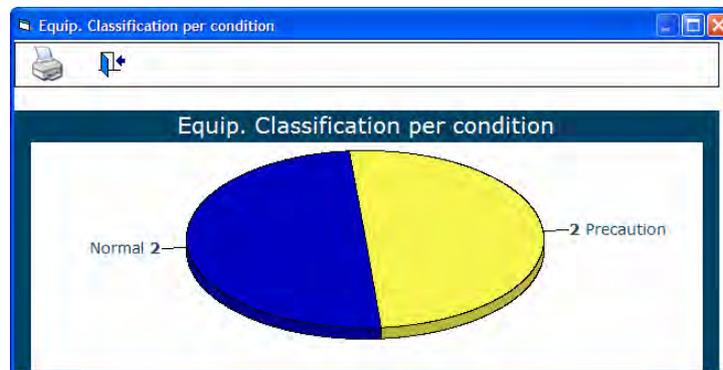


ICON to access document to selected equipment.

**Graphing Equipment by Condition:**



Clicking this ICON opens a pie chart which shows the equipment according to its alarm status:



**Adding Comments to Records:**

The software allows comments to be added to the equipment records, by entering them manually via this ICON:



**Comments by Equipment :**

Tools to input, edit and delete comments are available in the window, in which the record of comments by equipment can be seen.



ICON to add a new comment.



ICON to edit an existing comment.



ICON to delete a comment.

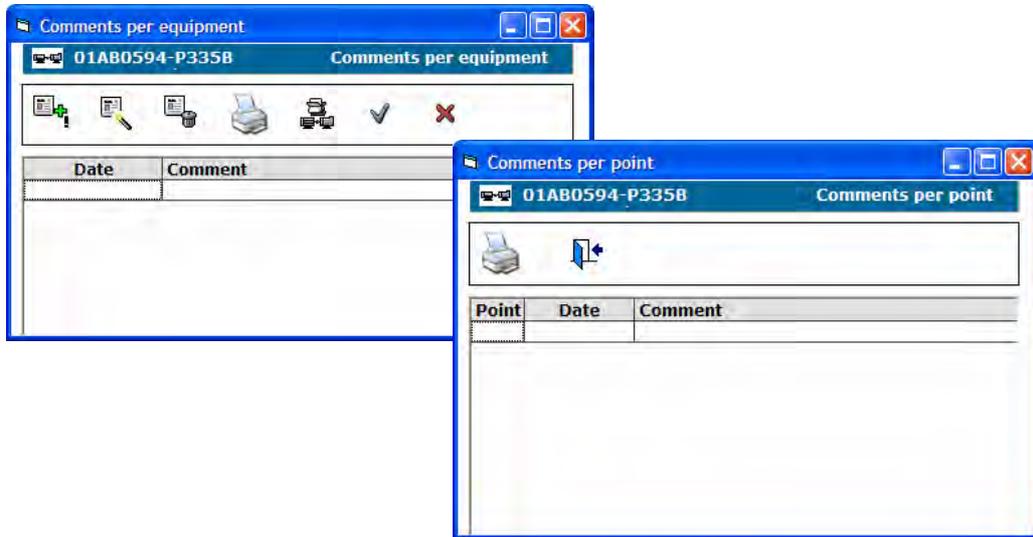


ICON to print comments.



ICON to read comments entered from the collector into points of the equipment

To apply a comment to any equipment, select the date and write the comment.



**Global Measurement by equipment :**

This function allows viewing a grid which contains the global measurement of an equipment, ordered by points, including spectra measurements. To use this function, select the equipment and click this ICON 

The viewing window will show the list of measurements performed over time, according to the selected filter.

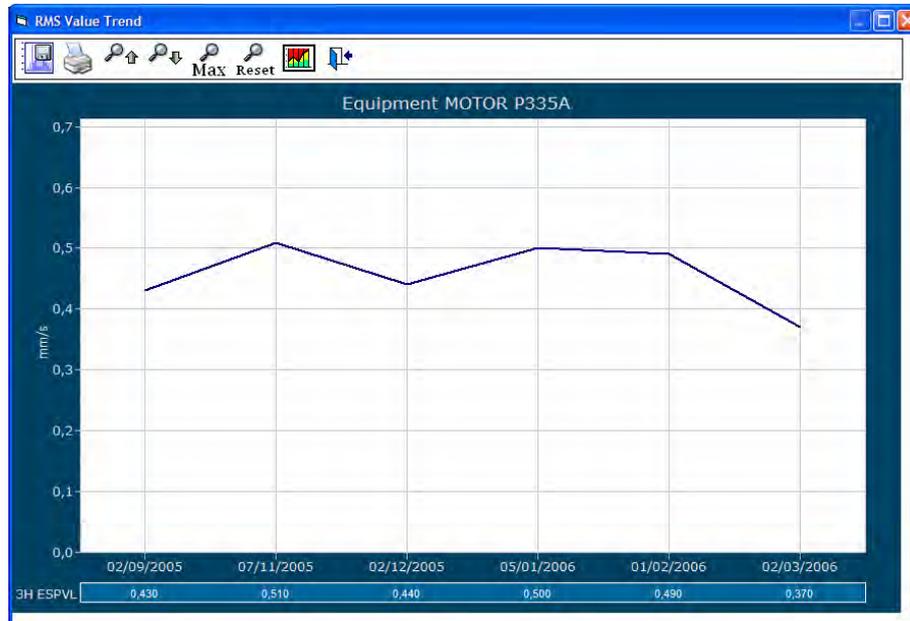
By double-clicking on any measurement, a trending graph for the measured values will be activated.

When the record of a measurement is selected, a trending graph can also be produced by clicking the ICON : 

Points	Measurement	02/03/2006	01/02/2006	05/01/2006	02/12/2005	07/11/2005	02/09/2005
1H	SPCVL	2,01	2,47	1,99	2,19	0,81	2,05
	SPCAL	0,63	0,63	0,63	0,72	0,25	0,53
1V	SPCVL	1,69	2,12	1,74	2,21	0,98	2,13
	SPCEL	0,33	0,64	0,34	0,32	0,17	0,38
1A	SPCVL	2,01	4,04	3,23	1,88	1,27	3,55
	SPCAL	0,48	0,68	0,60	0,62	0,37	0,64

Double-clicking on any value(s) will deactivate the value(s) and keep them from appearing in the trending graph.

Measurement	02/03/2006	01/02/2006	05/01/2006	02/12/2005	07/11/2005	02/09/2005
ESPVL	2,01	2,47	1,99	2,19	0,81	2,05

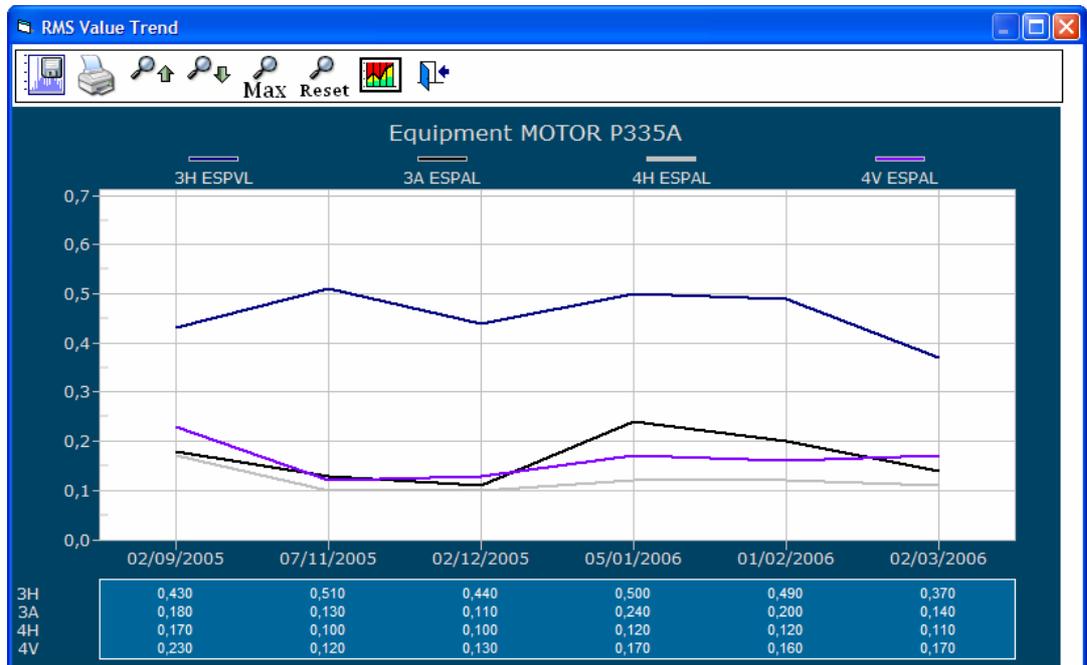


**Trend Graphs and Comparison Graphs for Points and Variables**

The Record function for equipment allows the operator to compare measurements made on different points of selected equipment, including different variables (velocity, acceleration, and envelope).

Select the points and measurements to produce the comparisons.

Points	02/03/2006	01/02/2006	05/01/2006	02/12/2005	07/11/2005	02/09/2005
3H	0,15	0,10	0,09	0,10	0,14	0,19
	0,37	0,49	0,50	0,44	0,51	0,43
3V	0,25	0,32	0,31	0,30	0,22	0,23
	0,48	0,67	0,59	0,45	0,32	0,42
3A	0,17	0,15	0,13	0,14	0,14	0,13
	0,14	0,20	0,24	0,11	0,13	0,18
4H	0,93	1,01	0,82	0,98	0,99	1,08
	0,34	0,36	0,39	0,34	0,43	0,31
4V	0,11	0,12	0,12	0,10	0,10	0,17
	0,29	0,25	0,31	0,25	0,27	0,37
	0,17	0,16	0,17	0,13	0,12	0,23
	0,88	0,68	0,64	0,72	1,31	1,00



**Standard Values with Trend Graphs of Multiple Variables:**

To produce graphs with the ISO Standard values, click this ICON:



The variable to be indicated in the graph must be selected as shown in the figure:



The variable must be selected each time the command is used.

**View Values of all Equipment Measurements per ISO 10816**

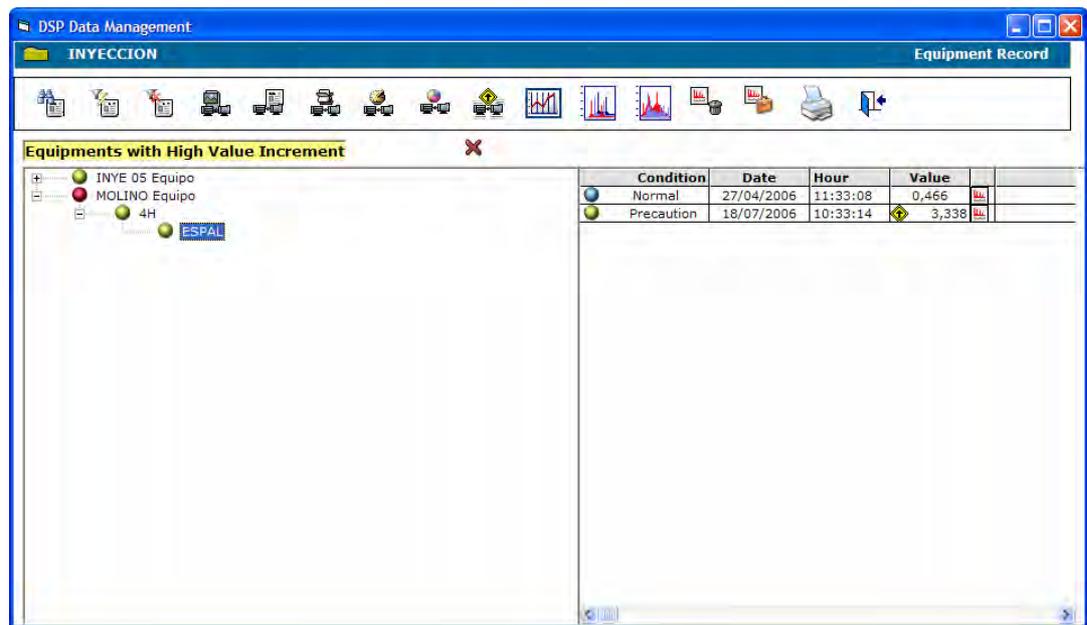
This function paints each value of the Record with a color according to ISO Standard 10816 for velocity values, and using severity criteria for acceleration values.

Points	Measurement	02/03/2006	01/02/2006	05/01/2006	02/12/2005	07/11/2005	02/09/2005
3H	ESPAL	0,15	0,10	0,09	0,10	0,14	0,19
	ESPVL	0,37	0,49	0,50	0,44	0,51	0,43
	ESPEL	0,25	0,32	0,31	0,30	0,22	0,23
3V	ESPVL	0,48	0,67	0,59	0,45	0,32	0,42
	ESPAL	0,17	0,15	0,13	0,14	0,14	0,13
	ESPEL	0,14	0,20	0,24	0,11	0,13	0,18
3A	ESPVL	0,93	1,01	0,82	0,98	0,99	1,08
	ESPVL	0,34	0,36	0,39	0,34	0,43	0,31
	ESPAL	0,11	0,12	0,12	0,10	0,10	0,17
4H	ESPEL	0,29	0,25	0,31	0,25	0,27	0,37
	ESPAL	0,17	0,15	0,17	0,13	0,12	0,23
	ESPVL	0,88	0,68	0,64	0,72	1,31	1,00

**Vibration Values on the Increase:**

When monitoring and performing route measurements on lots of equipment, important increases in measurements frequently are present but oftentimes go undetected. For these cases, the DSP software includes a tool to detect such increases, filtering the equipment and points affected.

This command is activated using this button   
 Here is the filtered Record showing that condition:



To disable the filter, use this button 

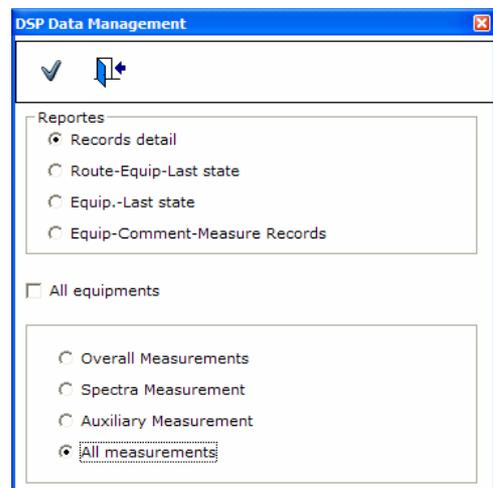
**Delete Records**

Deleting measurements of a point can only be done manually, point by point, using this ICON



**Record Reports:**

The Record application offers different reporting options, which can be selected by activating the printing function. Printing options will vary by the selection of equipment



All Record reports are first shown in a print-preview mode. This helps the user familiarize him self with the information before making a final print-out. The different options available can be selected from the printing window.

**Export Reports:**



Exporting reports can be done using this command.

All reports generated by the DSP software can be saved into other formats. This utility permits generating the desired file format for writing company reports, saving to files, sending via e-mail, etc. When the export command is activated, the format and final destination can be chosen from this window:



**Record Reports:**

Record Detail

**Record detail**

<b>Plant</b>	<b>VINT. BV BOO</b>			Printing Date: 20/07/2006
BETWEEN 20/07/2005 Y 20/07/2006				
<b>Equipment</b>	<b>01AB0593-P335A</b>	<b>3K6X4X16/141RV</b>		
<b>Measurem</b>	<b>Date</b>	<b>Hour</b>	<b>Value</b>	<b>Condition</b>
<b>Point 1A</b>				
ESPAL	02/09/2005	13:42	0,64	Normal
	07/11/2005	11:58	0,76	Normal
	02/12/2005	10:16	0,48	Normal
	05/01/2006	13:19	0,59	Normal
	01/02/2006	12:43	0,69	Normal
	02/03/2006	9:52	0,52	Normal
ESPVL	02/09/2005	13:42	1,95	Precaución
	07/11/2005	11:58	2,88	Precaución
	02/12/2005	10:16	1,99	Normal
	05/01/2006	13:20	2,35	Precaución
	01/02/2006	12:43	3,05	Precaución
	02/03/2006	9:52	1,94	Precaución
<b>Point 1H</b>				
ESPAL	02/09/2005	13:42	0,64	Normal
	07/11/2005	11:57	0,61	Normal
	02/12/2005	10:15	0,65	Normal
	05/01/2006	13:19	0,71	Normal
	01/02/2006	12:43	0,64	Normal
	02/03/2006	9:52	0,54	Normal
ESPVL	02/09/2005	13:42	1,62	Precaución
	07/11/2005	11:57	2,10	Precaución
	02/12/2005	10:15	1,78	Precaución
	05/01/2006	13:19	1,70	Precaución
	01/02/2006	12:43	1,88	Precaución

## Equipment Status by Route

## Condition of equip. Per route

<b>Plant</b> VINT. BV BOO	Printing Date: 20/07/2006
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BETWEEN 20/07/2005 Y 20/07/2006

Route	VINT. BV BOO	PLANTA BOOSTER
Equipment	Description	Condition
01AB0593-P335A	3K6X4X16/141RV	3 Precaución
01AB0594-P335B	3K6X4X16/141RV	3 Precaución
MOTOR P335A	MOTOR WEG 75HP BA7016	2 Normal
MOTOR P335B	MOTOR WEG 75HP BA7016	2 Normal

## Last Condition of Equipment

## Equip. Last condition

<b>Plant</b> VINT. BV BOO	Printing Date: 20/07/2006
---------------------------	---------------------------

BETWEEN 20/07/2005 Y 20/07/2006

Equipment	Description	Condition
01AB0593-P335A	3K6X4X16/141RV	3 Precaución
01AB0594-P335B	3K6X4X16/141RV	3 Precaución
MOTOR P335A	MOTOR WEG 75HP BA7016	2 Normal
MOTOR P335B	MOTOR WEG 75HP BA7016	2 Normal