

Internet Monitoring Services

This document introduces MISTRAS Group's Substation Reliability Internet based, Remote Monitoring Services. These services offer a complete monitoring solution to complement our complete line of advanced Acoustic Emission and Services.

Our internet monitoring systems allow the user to monitor the status of a remotely located power equipment (transformers, breakers, instrument transformers, gas-insulated substations, etc...), over the internet, in the comfort of his/her office or home and feel safe knowing that the equipment is being monitored continuously around the clock and that a staff of NDT specialists are regularly analyzing and reporting on its integrity.

Our Internet Data Acquisition, Monitoring, Analysis and Alarm services include the following:

- ↳ These services are of reasonable cost and minimize the use of already stretched maintenance staff within a company.
- ↳ We can install a remote AE system, connect it to the internet and automatically and continuously download summary and statistical data, alarm status information and parametric (other sensors) data. We also monitor for alarm conditions, alerting and contacting the appropriate persons in case of an alarm or emergency.



- ↳ We provide an internet web site where the user (customer) can log into his/her private area for reviewing the system status and alarm information, any time, 24 hours a day.
- ↳ We provide a service to retrieve the raw AE data from the system, analyze the data on a regular (pre-arranged and contracted) basis (daily, weekly, biweekly, monthly, etc.) and provide an analysis report that is deposited on the web site for review and downloading by the customer.
- ↳ We provide daily monitoring engineering services as required or requested by the customer to determine severity of a problem.

Internet Monitoring Website Example

An example of our standard Internet Monitoring Web page is provided. This can be modified easily to provide specific customer information on the site activity.

www.rma.mistrasgroup.com

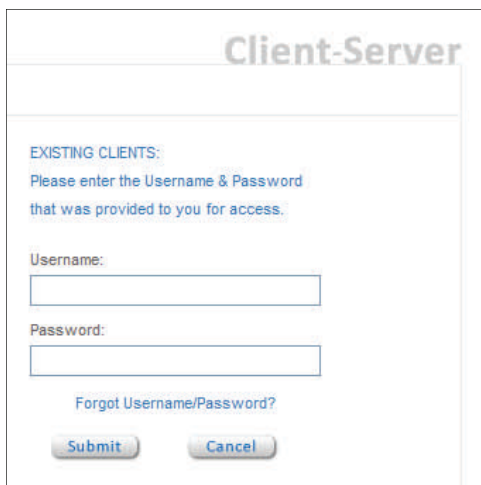


Figure 1. Login Screen

Upon entering the Remote Monitoring Web Services page using a web browser and entering his/her private login and password (figure 1), the customer's Site Summary page is displayed (figure 2). This site is only available for viewing by those authorized by the customer and those providing MISTRAS Group Analysis services. All data is private and is not divulged.

The site summary screen usually shows a picture of the unit being monitored (top left), provides summary management information about the site (top center) including, important contact points and the equipment. It also provides summary AE system statistics about the latest monitoring period, below the management information, usually updated hourly, although the user can request a higher or lower update rate. On the left of the screen a launch site menu is provided for viewing other information related to the installation or activity (note the

menu's on the left of the screen in figure 2). Menu choices allow for the viewing of activity graphs (graphs of AE parameters versus time) as shown in



Figure 2. Site Summary Screenshot Example

figure 3, Channel activity plots (graphs of activity against channel) as shown in figure 4, a report review or pickup area as shown in figure 5 and sensor location charts a typical example of which is shown in figure 6.

Internet Monitoring Website Example *(continued...)*

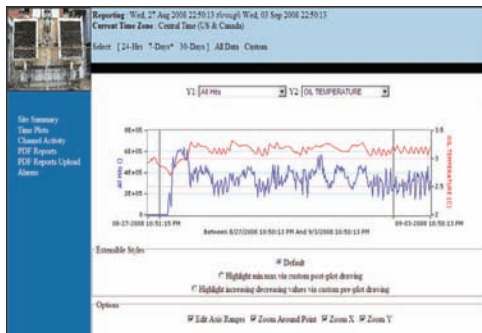


Figure 3. Activity vs. Time Graphs Example

Figure 3 shows a typical AE activity versus time graph. Independent parameters can be displayed. The selection box allows many different parameter selections including; viewing hits, events, event group, counts, energy, ASL and or parametrics (load or environmental reading) versus time. The user can also select any specific time period for review.

Figure 4 shows an example of a Channel activity graph. Channel Activity can be monitored over a selected period of time and multiple variables. Selections include Hit activity versus channel, ASL versus channel, event versus event groups is available.

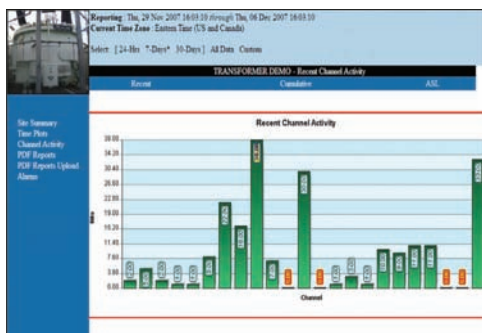


Figure 4. Channel Activity Graph Example

Figure 5 shows a location for reviewing and picking up analysis reports that have been deposited to the site in a regular manner by MISTRAS Group analyst's. These reports have been formatted as "Acrobat" PDF files for compression and easy internet reading and review. The customer can review the reports directly on the site by right clicking the mouse over the desired report or the user can download the PDF report to his own computer for personal review and archival. Report intervals are determined by the contract set with MISTRAS Group. MISTRAS Group regularly collects the raw data from the site, archives the raw data, and performs detailed analysis using the latest

location analysis, clustering techniques and pattern recognition tools to spot trends, find and locate possible problem areas. These reports summarize the data in the form of a Management summary, graphics for easy understanding, observations, analysis results, conclusions and recommendations.

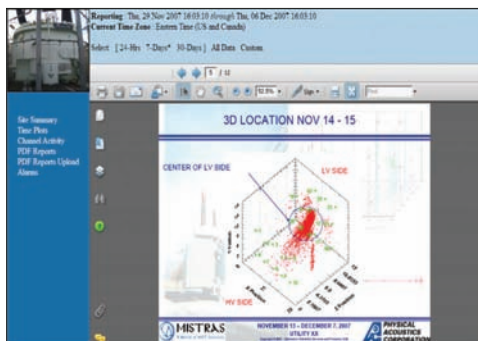


Figure 5. Analysis Report Page Example

Figure 6 shows a typical sensor location diagram. This sensor location diagram may provide one or multiple views of the various locations of each sensor on the transformer. This helps the customer identify where data as shown in some of the previous activity graphs, channel graphs or event graphs may be occurring on the unit. The customer may see a trend where something of significance is happening on the structure. At this point, the customer may ask MISTRAS Group to perform some further analysis in this area and report back. This service is available at any time in order to help identify problem areas immediately.

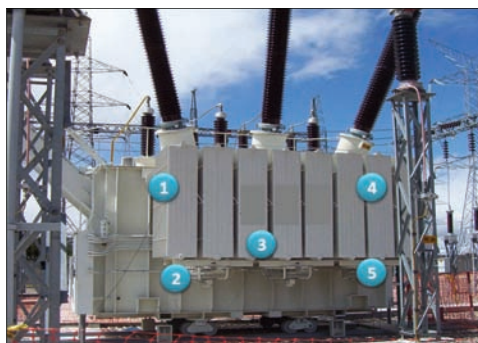


Figure 6. Sensor Location Diagram Example

Remote Control Engineering Services

As a part of our MISTRAS Group monitoring services, we also provide remote control Engineering services to make sure that the system is being fully maintained and that all system settings are kept appropriately. Via the internet, we can modify system pa-

rameters or setups as required or requested to be sure that the system remains as sensitive as possible towards the detection of important activity. This service cuts down on the need to constantly travel on-site, ultimately saving significant time and money.

Service Contracts for Instrumentation and Installation

In addition with the remote control services, we can offer remote maintenance and diagnostics for the customer. With a service and maintenance contract we can troubleshoot the system remotely, and schedule repairs in a more cost effective manner for the customer. We can upgrade software remotely and install new software options as requested by the customer without the need for the customer to take chances himself to perform these complex installations.

Summary

We hope this small insight into our monitoring services has given you an idea of the power, and convenience we offer in the managing one's power equipment inventory and continuously assuring its safety and structural integrity.

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MISTRAS Group Inc. provides nondestructive testing products and services under well-known industry recognized brand names including CONAM Inspection & Engineering Services Inc., Physical Acoustics Corporation, and Vibra-Metrics as well as regional or product specific brand names.

MISTRAS provides Asset Inspection and Mechanical Integrity solutions to the Oil & Gas, Power Generation, Aerospace, Infrastructure and Manufacturing sectors as well as strategic on-line instrumentation that facilitates Plant Asset Management.

In addition, MISTRAS provides Enterprise Solution Software that aids in the safe and profitable operation of industrial facilities worldwide.

MISTRAS GROUP... A World of NDT Solutions!