The Inspector Newsletter

SKF Microlog Inspector

SKF

SKF Microlog Inspector Newsletter Q1, 2013

A Passion for Reliability

By John Yolton

Zellstoff's Celgar market pulp mill is nestled in the Columbia river valley in the southern Canadian Rockies where the Kootnay and Columbia rivers converge.

This mill produces approximately 520,000 Air Dried Metric Tonnes (ADMT) of Northern Bleached Softwood Kraft (NBSK) pulp annually.

It is one of the largest and most modern single line kraft pulp mills in North America following the completion of a project to increase production and efficiencies in 2007. Subsequently in 2010 Celgar completed its Green Energy Project. The C$64.9 million project included the installation of a second turbine-generator set with a design capacity of 48 MW to increase the mill's installed generating capacity to 100 MW. The mill sells excess electricity to BC Hydro under a long term contract.

Starting in 2007 the mill's reliability team recognized improvements in asset efficiencies would require additional, more accurate and timely data from which to make decisions.

Assets Monitored

The new Turbine Generator, generating additional revenue for the mill, changed the criticality of the existing assets requiring a modification of the mind-set within the mill's culture. Today the assets being monitored consists of:

- 2 Steam Turbines, (48MW and 52 MW)
- 652 Pumps

- 8675 Electric Motors and 6 Hydraulic motors
- 456 Gearboxes
- 4 Compressors
- Lots of process rolls, in both slow and variable speed applications

Technology Deployed

Machinery health information is derived from the following technologies:

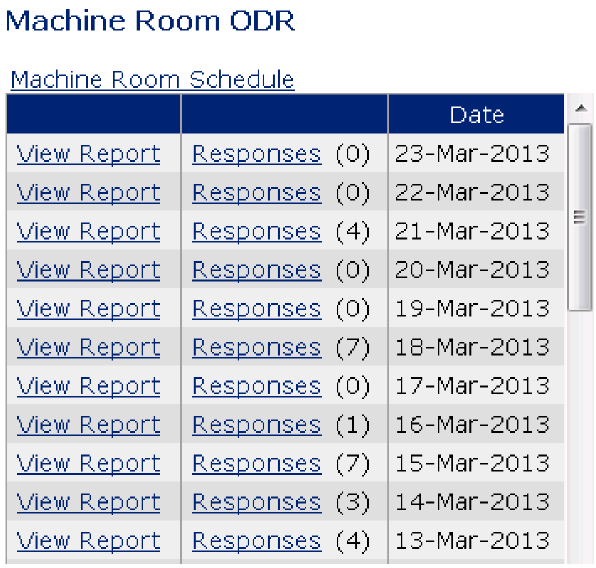
- Condition monitoring system,
    - SKF @ptitude Monitoring Suite
        - @ptitude Analyst, (Route Based, and wireless)
        - @ptitude Monitor, (DMx's)
        - @ptitude Inspector (ODR)
        - @ptitude Decision Support (@DS)
- MOPS, DCS process data/ Data historian
- Avantis CMMS system integration with @DS
- Root cause analysis, (Apollo),
- Operating Investigation Reports, (OIR)
- ESSO's EPLUS lubrication software

The Process

Involving operators in collecting condition monitoring data was essential to the program's success as the Operator Driven Reliability (ODR) process routinely monitored specified critical equipment on a shift-by-shift, daily basis.

Five (5) SKF Microlog Inspectors are in use within the Pulp Dryers (2), Recaust and Wood Room areas, with the Digester area next following recommendations derived from the SKF RCM (SRCM) study.

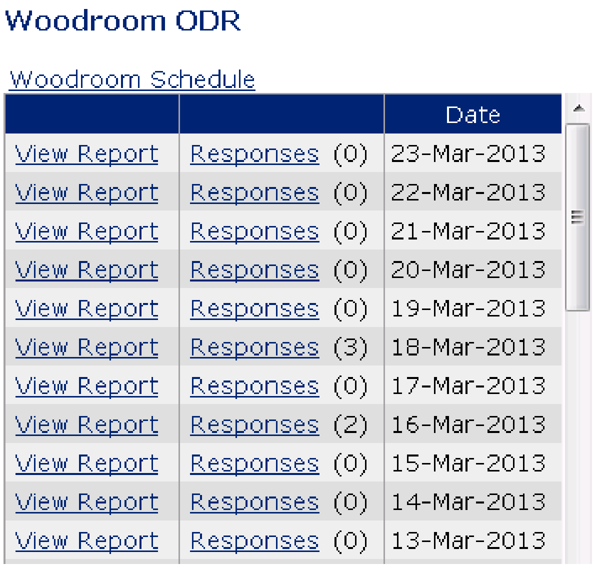
The Operator Driven Reliability (ODR) program has grown in its sophistication through the years to the point that there is a 'home page' for ODR reports on the company's main information page, shown below. Typically there are 35-40 weekly alarms/alerts triggered by ODR inspections to which there is instant response prioritized by asset's 'criticality'.



Machine Room ODR

Machine Room Schedule

		Date
View Report	Responses (0)	23-Mar-2013
View Report	Responses (0)	22-Mar-2013
View Report	Responses (4)	21-Mar-2013
View Report	Responses (0)	20-Mar-2013
View Report	Responses (0)	19-Mar-2013
View Report	Responses (7)	18-Mar-2013
View Report	Responses (0)	17-Mar-2013
View Report	Responses (1)	16-Mar-2013
View Report	Responses (7)	15-Mar-2013
View Report	Responses (3)	14-Mar-2013
View Report	Responses (4)	13-Mar-2013



Woodroom ODR

Woodroom Schedule

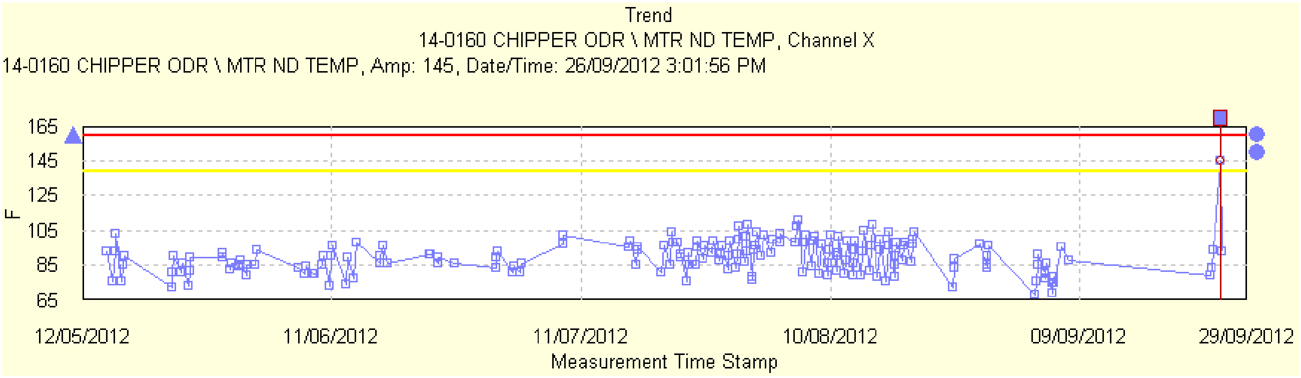
		Date
View Report	Responses (0)	23-Mar-2013
View Report	Responses (0)	22-Mar-2013
View Report	Responses (0)	21-Mar-2013
View Report	Responses (0)	20-Mar-2013
View Report	Responses (0)	19-Mar-2013
View Report	Responses (3)	18-Mar-2013
View Report	Responses (0)	17-Mar-2013
View Report	Responses (2)	16-Mar-2013
View Report	Responses (0)	15-Mar-2013
View Report	Responses (0)	14-Mar-2013
View Report	Responses (0)	13-Mar-2013

This 'game-changing' process has resulted in a role change for the PdM analysts from one of collecting data on time-based routes to much needed maintenance of the asset database and follow through on reported events found through the ODR program and the installed online monitoring systems.

Case History

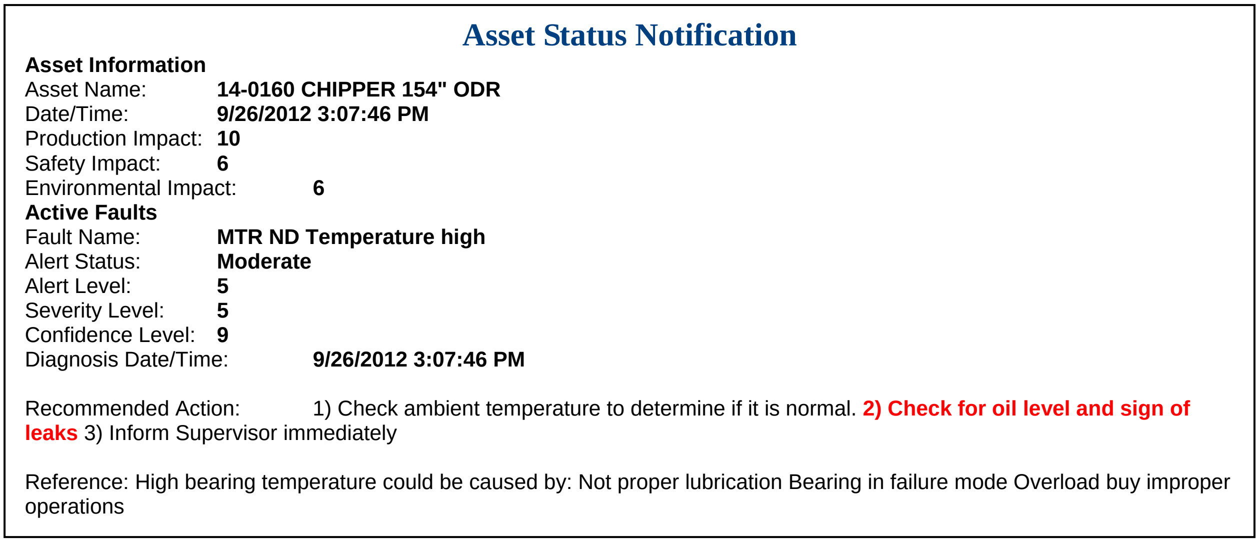
In the Wood Room the 154" diameter chipper is driven by an electric motor. Failure of this motor would severely impact the continuous operation of the mill should it fail and require replacement, especially unplanned replacement. This 'criticality' places the chipper motor on the ODR route.

One of the data points collected with the Microlog Inspector for this asset is temperature. On the chart below a sudden temperature rise is noted and recorded during a routine operator round.



This mill also incorporates @ptitude Decision Support to assist in making decisions based upon condition data collected from many sources, operator rounds included. Once this high temperature indication was received in the @DS application an alert was issued, shown below.

The wood room supervisor and operator immediately verified the oil level was low and replenished the lubricant as required.



Asset Status Notification

Asset Information
Asset Name: **14-0160 CHIPPER 154" ODR**
Date/Time: **9/26/2012 3:07:46 PM**
Production Impact: **10**
Safety Impact: **6**
Environmental Impact: **6**
Active Faults
Fault Name: **MTR ND Temperature high**
Alert Status: **Moderate**
Alert Level: **5**
Severity Level: **5**
Confidence Level: **9**
Diagnosis Date/Time: **9/26/2012 3:07:46 PM**

Recommended Action: 1) Check ambient temperature to determine if it is normal. **2) Check for oil level and sign of leaks** 3) Inform Supervisor immediately

Reference: High bearing temperature could be caused by: Not proper lubrication Bearing in failure mode Overload buy improper operations

Benefits

An unplanned downtime to replace the motor was averted. Avoided costs, which includes the downtime and unplanned replacement, as well as the cost of major repairs to the motor had it failed, represent savings well into six figures. Many other examples of avoided costs are evidence of this program's success.

Conclusion

By shift by day collection of asset condition data by operations plays a huge role in avoiding unplanned failures. Reducing unplanned outages improves asset reliability which provides increased production availability which in turn significantly adds to a mill's revenue stream thereby enhancing the future of the mill and its employees. No small task in this complex, competitive world.

We would like to acknowledge Dragan Trivanovic, the mill's PdM Leader, for his assistance providing information for this article.

PSM (Process Safety Management) Inspections

by Joe Schoultheis

Unexpected releases of toxic, reactive, or flammable liquids and gases in processes involving highly hazardous chemicals have been reported for many years in various industries that use chemicals with such properties. Regardless of the industry that uses these highly hazardous chemicals, there is a potential for an accidental release any time they are not properly controlled, creating the possibility of disaster.

To help assure safe and healthy workplaces, OSHA has issued the Process Safety Management of Highly Hazardous Chemicals regulation (Title 29 of CFR Section 1910.119) which contains requirements for the management of hazards associated with processes using highly hazardous chemicals. Many countries across the world have similar regulations. [1]

Any facility that stores or uses a defined "highly hazardous chemical" must comply with OSHA's process safety management (PSM) regulations, as well as the quite similar United States Environmental Protection Agency (EPA) Risk management program (RMP) regulations (Title 40 CFR Part 68). The EPA has published a model RMP plan for an ammonia refrigeration facility, which provides excellent guidance on how to comply with either OSHA's PSM regulations or the EPA's RMP regulations.

Why did OSHA develop PSM regulations? Bhopal, India (1984) 2,000 deaths from an Isocyanine release; Pasadena Texas (1989) 23 deaths and 132 injuries from a petroleum explosion; Cincinnati Ohio (1990) 2 deaths from explosion; Sterlington LA (1991) 8 deaths, 128 injured – chemical release. A great many industrial facilities must comply with OSHA's PSM regulations as well as quite similar EPA Risk Management Program regulations.

Fines issued to companies using highly hazardous chemicals who were found to be non-compliant run in the hundreds of thousands and even millions of dollars.

Where do companies start to develop a PSM inspection program?

Process safety information

- Identify the hazards of the chemicals used
- Identify the equipment that uses the chemicals
- Employee involvement

Mechanical integrity of the equipment

- Written procedures for inspections
- Inspections and testing
- Quality assurances

Compliance Audits

- Planning for regularly scheduled inspections
- Staffing
- Conduct the audit
- Evaluation and corrective action

Where does Microlog Inspector fit into this?

- Tracking the chemicals and equipment used in the Process
- Employee involvement
- Written procedures
- Inspection and testing
- Quality assurances
- **<u>Compliance audits</u>**
    - Planning and scheduling
    - Staffing
    - Conducting the audit
    - Evaluation and corrective action
    - <u>Documentation, reports</u>

How did one company start their PSM inspections?

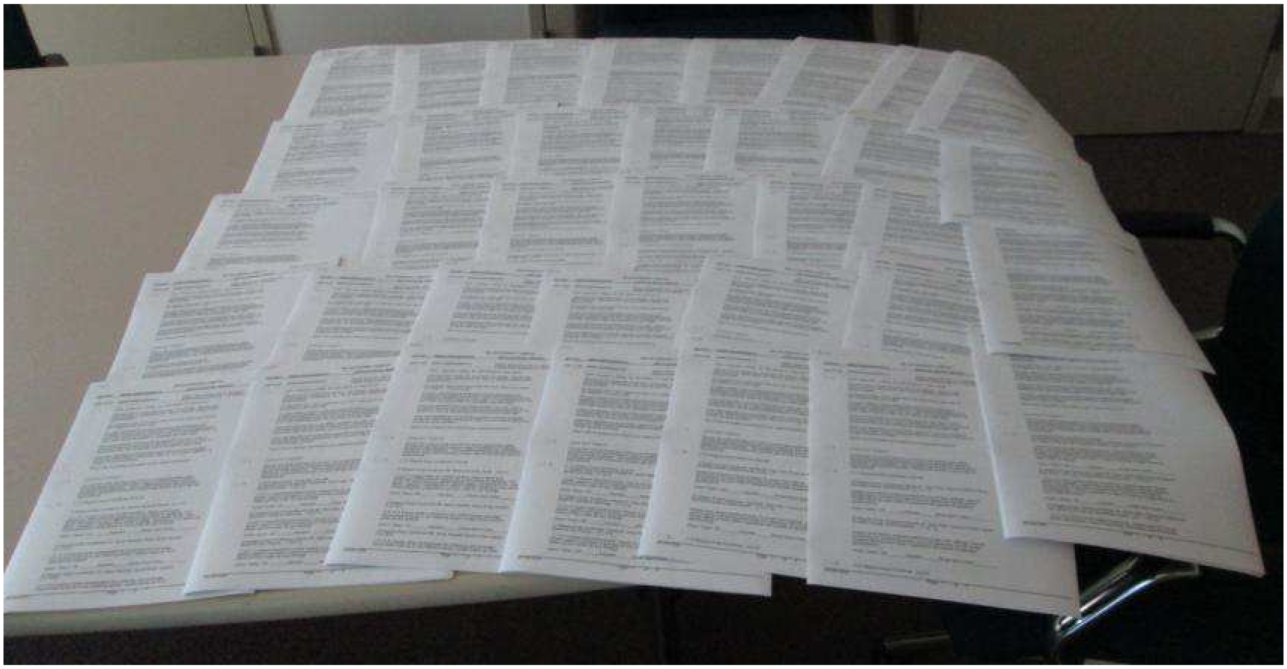
Very large air coolers are used at the plant for their refrigeration process with ammonia.

- **Maintenance instructions** were obtained
- A formal RCM (Reliability Centered Maintenance) based on WCM (World Class Manufacturing) Principles was developed
- Each asset requiring inspection was identified, numbered, named, failure mode identified, inspection task defined, frequency, inspection time. For example:

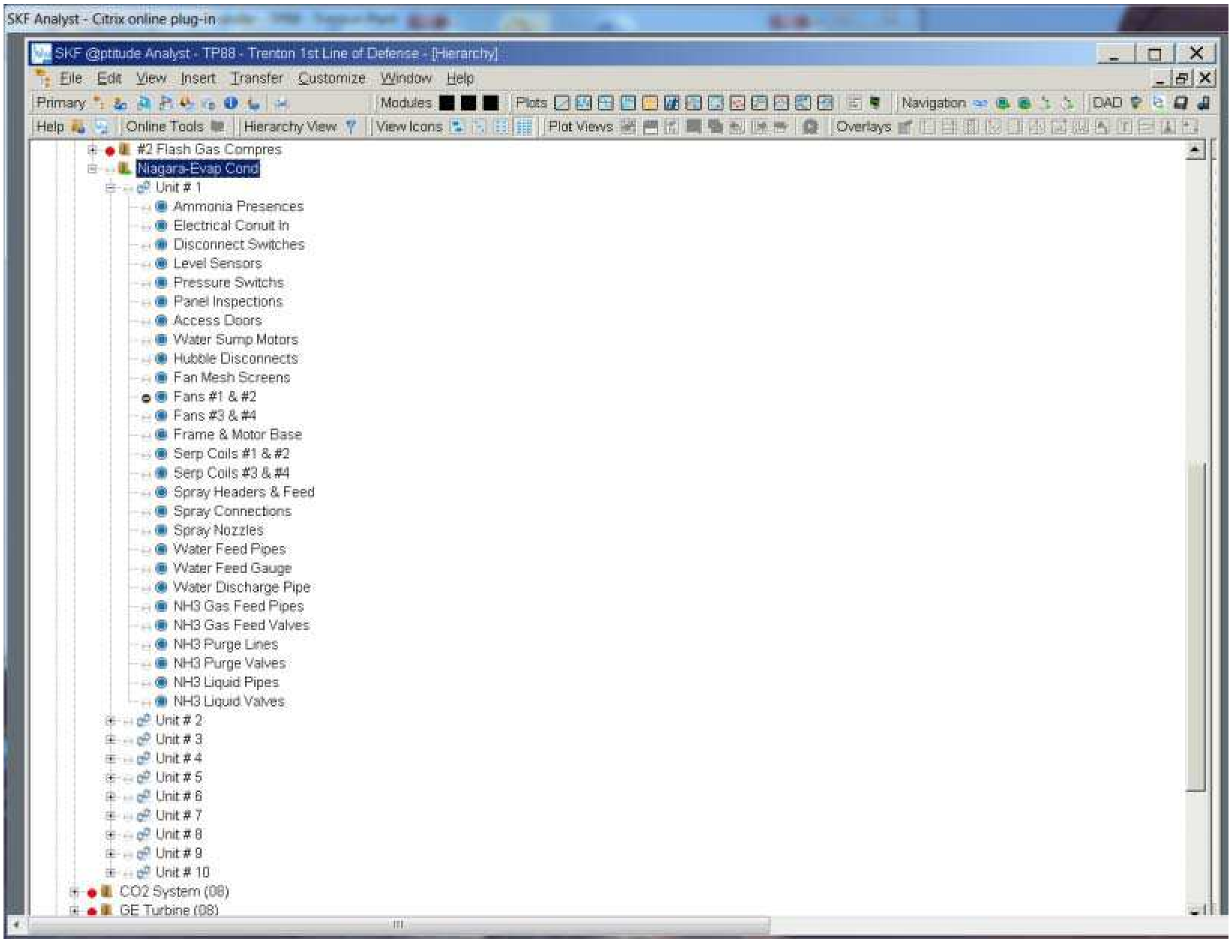
<u>Item 1.0</u> – Niagara Evap Condenser Panels #1

- Inspect for Leak
- PSM Task: Through a walk-about inspection slowly walk around the unit asset with an awareness for any signs of ammonia smell. If detected quickly vacate the area and alert management/supervisor.

The problem was – from this one asset, 38 Job Plans were created and loaded in the CMMS!

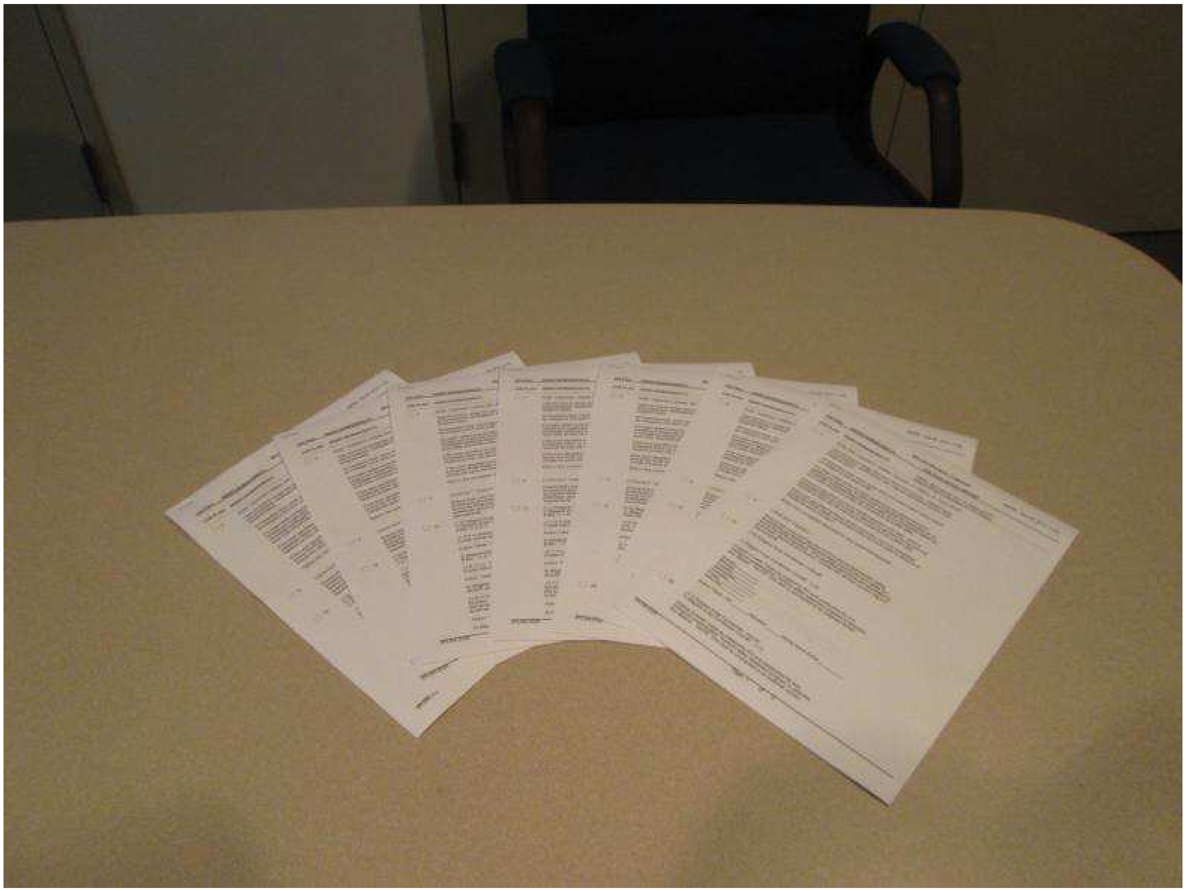


Could all of these inspections/measurements reside in Microlog Inspector?



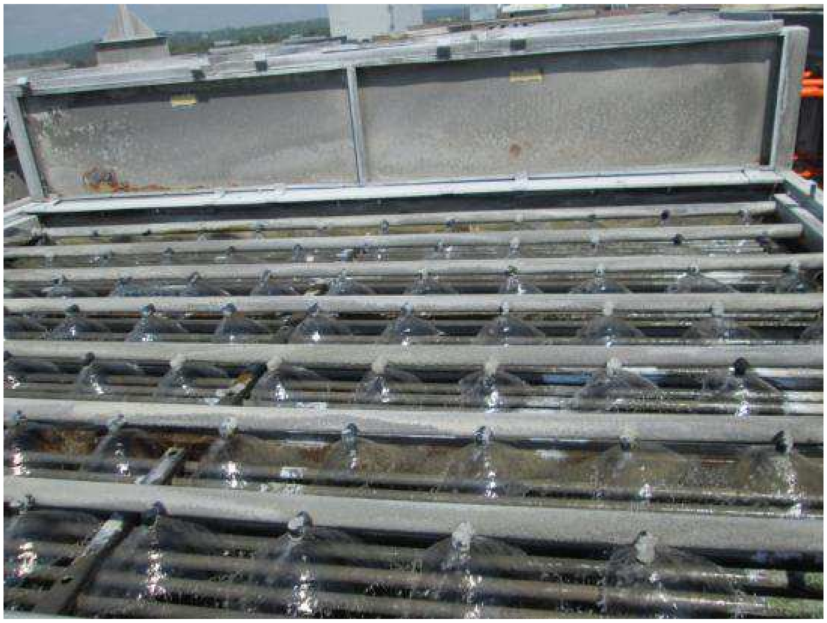
- #2 Flash Gas Compres
- Niagara-Evap Cond
  - Unit # 1
    - Ammonia Presences
    - Electrical Conuit In
    - Disconnect Switches
    - Level Sensors
    - Pressure Switchs
    - Panel Inspections
    - Access Doors
    - Water Sump Motors
    - Hubble Disconnects
    - Fan Mesh Screens
    - Fans #1 & #2
    - Fans #3 & #4
    - Frame & Motor Base
    - Serp Coils #1 & #2
    - Serp Coils #3 & #4
    - Spray Headers & Feed
    - Spray Connections
    - Spray Nozzles
    - Water Feed Pipes
    - Water Feed Gauge
    - Water Discharge Pipe
    - NH3 Gas Feed Pipes
    - NH3 Gas Feed Valves
    - NH3 Purge Lines
    - NH3 Purge Valves
    - NH3 Liquid Pipes
    - NH3 Liquid Valves
  - Unit # 2
  - Unit # 3
  - Unit # 4
  - Unit # 5
  - Unit # 6
  - Unit # 7
  - Unit # 8
  - Unit # 9
  - Unit # 10
- CO2 System (08)
- GE Turbine (08)

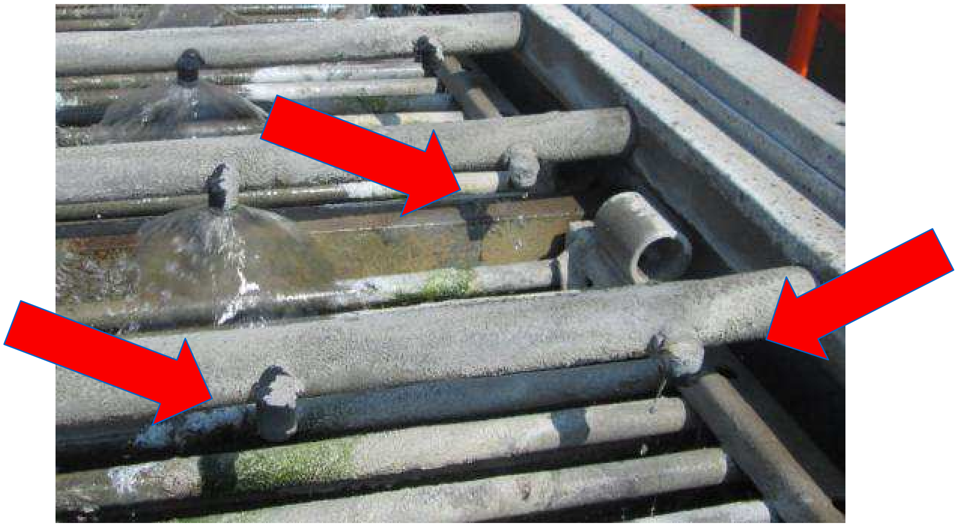
Loading all of the inspection/measurements into @ptitude Inspector for use with Microlog Inspector reduced the load to <u>7 job plans!</u>



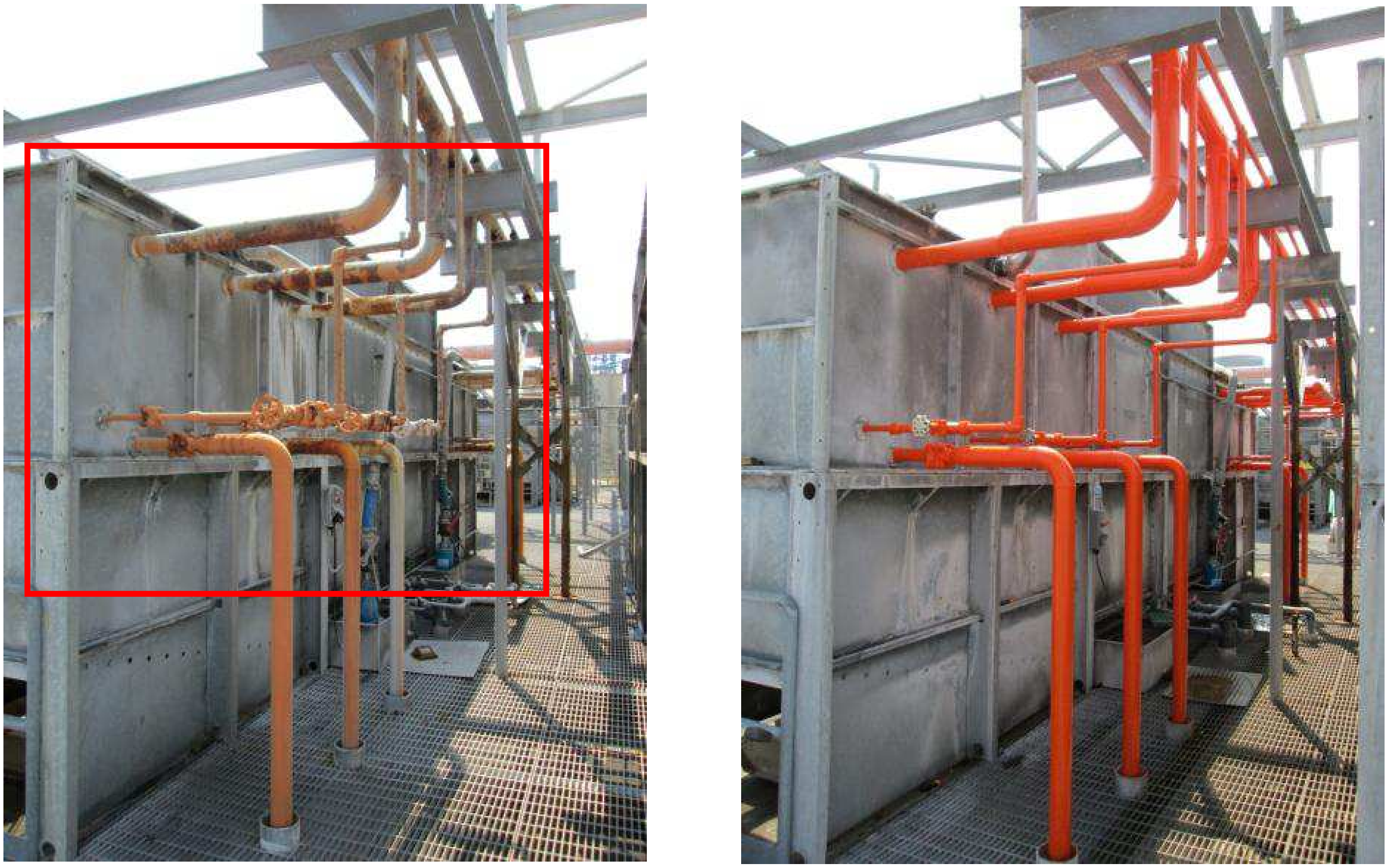
Empowering the Crafts to provide deliveries to the organization minimizing paperwork redundancies, moving to electronic data storage!

Catching the small problems before they become BIG problems - (blocked valves observed during routine inspections)





Delivering Inspection results for Action!



Corroded pipes identified through frequency inspection allowing for planned project replacement before any failure.

[1] Source – http://www.osha.gov

Connecting Microlog Inspector to Cloud Services

By Alex Pinkerton

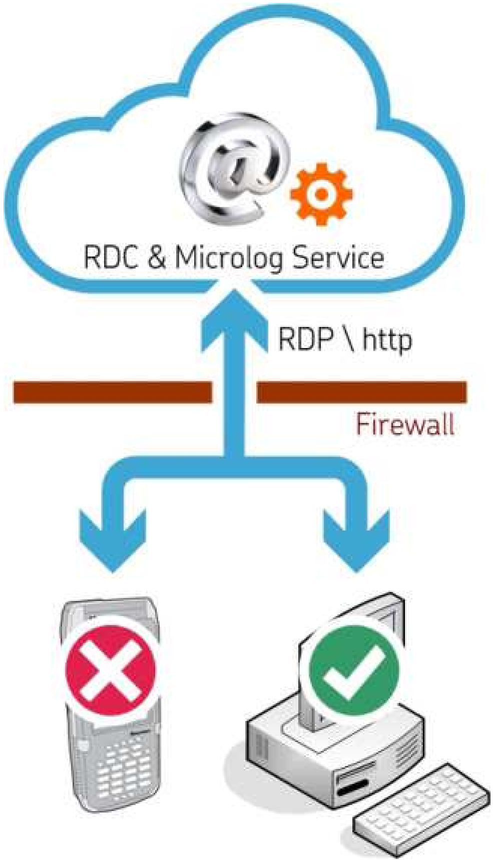
One of the confusions we've come across on a number of occasions is that of getting a Microlog Inspector handheld to communicate with the @ptitude Cloud Services (RDC).

Everything seems to be set up and running. The @ptitude client is running, hierarchy data is visible, the Microlog Inspector licenses are all properly installed, and yet, every attempt to connect Microlog Inspector to the Microlog Service fails!

So why is this and what can Customers and SKF Service Engineers do to resolve this issue?

Well first of all let's look at how most people typically image the Cloud Services are configured:

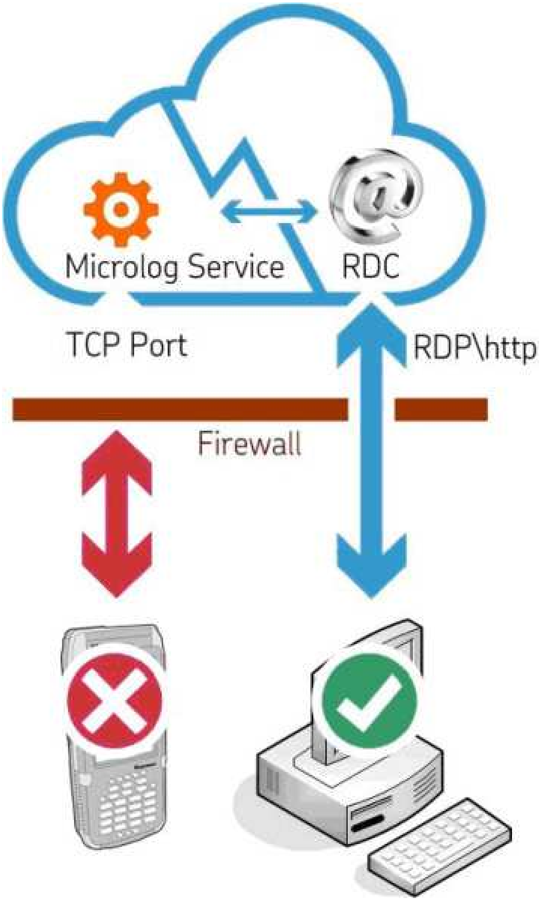
We imagine we have a Cloud that hosts both the Remote Data Center (RDC) and the Microlog Service. Our PC can connect to the Cloud, the Microlog Inspector handheld fails. **What is the problem?**



What's wrong with this picture?

Well the problem is simple one: that is not how it works.

Including a picture that's wrong is important because it highlights just how misleading assumptions can be – especially in the world of Networking!



OK, so now let's redo the previous diagram, only now let's draw a representation of what is actually happening - and not what we imagine is happening!

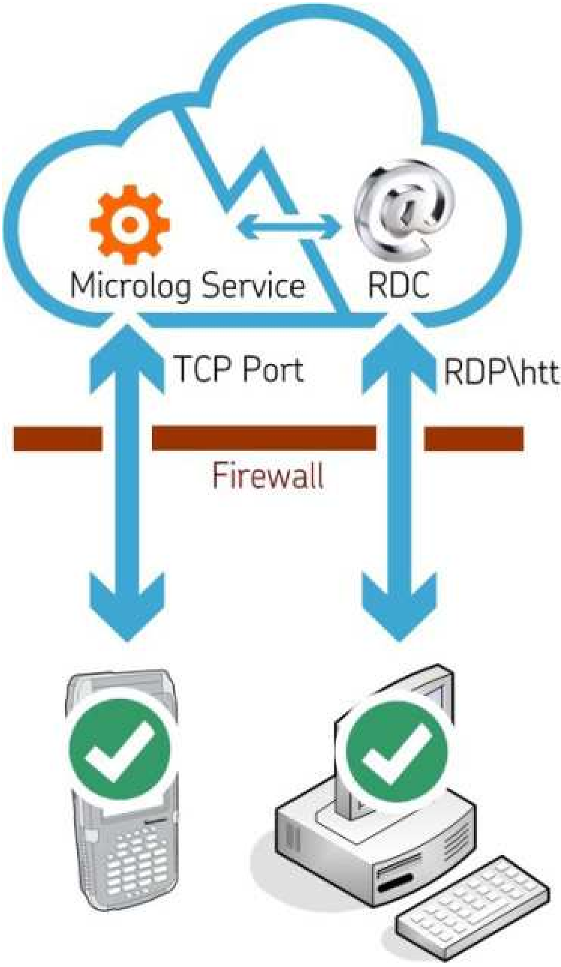
Reality Bites!

Almost immediately we see the cause of the problem! Instead of the RDC and the Microlog Service being one and the same, in fact they are two completely different processes operating in the cloud (albeit processes which are interconnected).

So even though the Firewall has been opened to allow http (web data) and RDP (RDC communications) to pass though, **with the TCP Port still closed, Microlog Inspector cannot communicate.**

Thankfully the solution to this particular problem is simple one:
open the TCP Port in the Firewall. **Really – it's that simple.**

A happy ending!



Automatic Valve Inspections

By Charlie Unfricht
ODR Applications Engineer

One component of plant efficiency and reliability that is often overlooked is automatic valves. They are typically the domain of the E&I department in most facilities and never really thought about by operation. But that doesn't mean that there aren't inspections production can do to help keep them reliable. Automatic valves can cause process upsets, quality deviations and unscheduled downtime, among other things. So, does your Inspection/ODR program include valve inspections?

In this article I will outline some items the Micrologue Inspector could be used to address.

Valve Inspection Questions:

Running

- Is the valve leaking?

Loose Bolts

Gasket leak

Valve body leaking/damaged

- What is the air pressure to the I/P (current input to pressure output) converter?
- Does it meet the valve manufacturer's specifications?
- What is the condition of the piping around the valve?

Leaks

Hangers

Supports

- What is the condition of the air supply tubing/hose?

Loose fittings

Cracked/Leaking

Rusting

- Is there a water trap installed?

If yes is water building up?

Drain water and document how much was drained.

- Positioner and I/P condition

Condition of pressure gauges

Positioner not securely mounted

Covers in place

- Is the position indicator legible

Down

- Verify valve strokes properly to the following percentages

25%/50%/75 %/100 %

- Remove covers and inspect I/P and positioner for signs of rust etc.

Automatic valves can cost your facility a lot of money. I know of one automatic steam valve that was out of calibration. The estimated annual savings for repairing/re-calibrating this valve was $250,000. So if you answered no to valves being part of your ODR process, you may want to consider the potential value of adding them.

If you have a topic related to applications for the Microlog Inspector, you would like discussed.
Please contact me at Charlie.Unfricht@SKF.com

Thanks for reading.

Operator-Driven Reliability Best Practices Series: “Coping with innovation: No place for wimps!”

By Dave Staples

Think about how often a mobile phone or personal computer is upgraded, every 2 or 3 years? Did you think this was a ploy by the original equipment manufacturers (OEM) to make money? Maybe partly, but it is the only way to deliver the latest technology. Every 2 to 5 years, there are major innovations for mobile devices in memory, processors, performance, displays, durability, size, connectivity, and conveniences. So like it or not, innovations are coming and probably faster than you want.

Very few people like unexpected change. To minimize the distress of technology changes, plans should be put in place anticipating the fast moving technology window. In order for OEMs to deliver more hardware dependent features, like WiFi, enhanced cameras, global positioning satellite (GPS), etc..., they need to change the hardware platform of the mobile device.

The typical planned life cycle of a mobile device is 3 to 4 years. As users of mobile devices, a technology life cycle plan should be every 4 to 5 years. There will also be incremental software updates throughout the product’s life cycle bringing new features, fixing “bugs” and improving performance. These updates are usually installed via software down loaded from an OEM website and are included in most maintenance or service agreements. These software updates are typically not as much a financial burden as making a platform change with the device. Costs associated with platform changes almost always require capital funding. **And you know how much we all enjoy requesting capital funding…**

The ODR sustainability team needs to plan for both types of technology changes, hardware and software innovation. The plan needs to incorporate the cost associated with the technology maintenance agreements and platform upgrades. Plans must also include the human resources, in house or sub-contracted, necessary to rollout the technology, “turn on and configure” new features, and train the users. It is pragmatic to recommend utilizing resources experienced with the new technology to assist with these rollouts. Inexperienced support deploying new technology can be inefficient and lead to rework. It all may sound fairly straight forward but there can be hidden details to the plan. **For example training material needs to be updated. Infrastructure may need to be installed, such as wireless routers if going Wi-Fi for the first time. If new features introduce new inspections, work process documentation may need to be updated**.

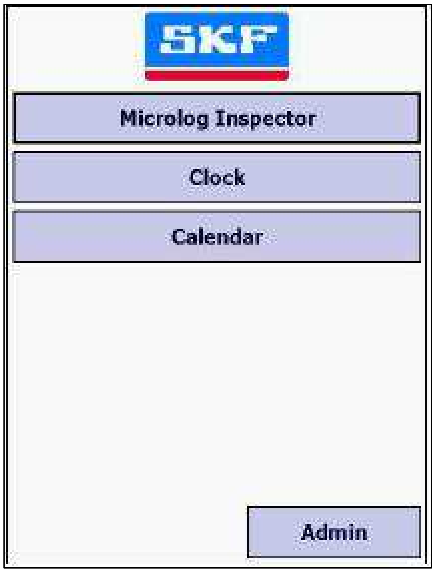
Technology changes quickly. For companies staying in the forefront of ODR, this can be a good thing. Anticipating and planning for technology updates and upgrades can help make these changes seemless.

What is coming up for Microlog Inspector?

By Travis Bottalico

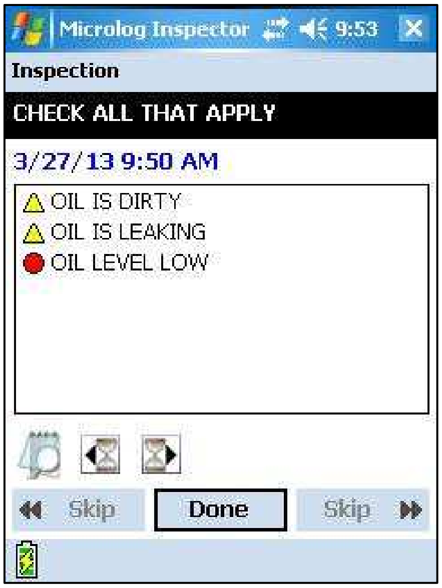
A new firmware version (v1.4.4) will be available soon to all Microlog Inspector customers, and we thought we’d give an update on the features that are being included.

Camera Integration for the CMDM 6700 – Gives customers the ability to capture photos from within the Microlog Inspector application.



Microlog Inspector Secure – a support application that can be installed on a CMDM 6600 or CMDM 6700 device to launch only Microlog Inspector or other pre-selected applications such as the calculator (instead of all the applications, games and settings on the device being available). It also configures the hardware buttons for more optimized barcode scanning options.

Inspection Review – Review previous inspection POINT measurements on the handheld



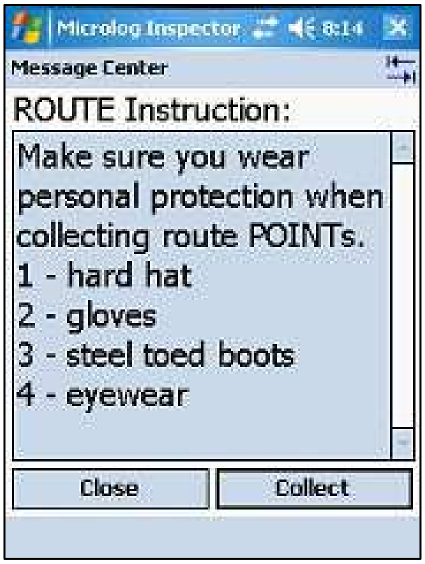
Inspection

CHECK ALL THAT APPLY

3/27/13 9:50 AM

⚠ OIL IS DIRTY
⚠ OIL IS LEAKING
● OIL LEVEL LOW

ROUTE Instructions – View ROUTE instructions that are configured in the @ptitude Inspector Software



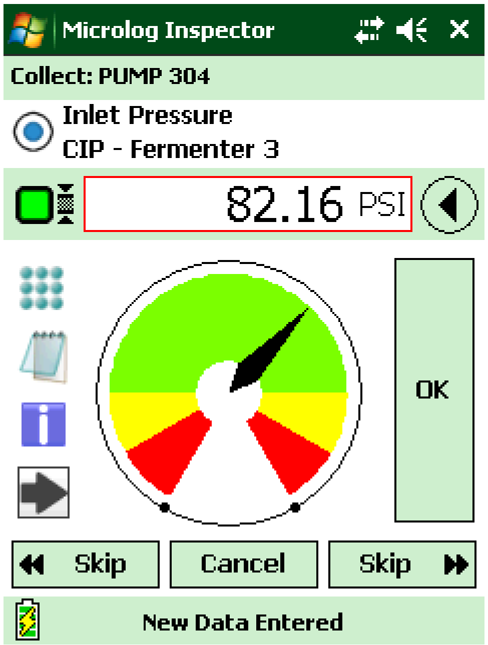
Message Center

ROUTE Instruction:

Make sure you wear personal protection when collecting route POINTs.
1 - hard hat
2 - gloves
3 - steel toed boots
4 - eyewear

User Interface Improvements –

- High Contrast user interface option
- Custom keyboard button for easier text input
- Machine name will be available from POINT collection screens
- Asset name will be displayed when users are prompted to scan for a tag
- Improved alarm icons in POINT review screens



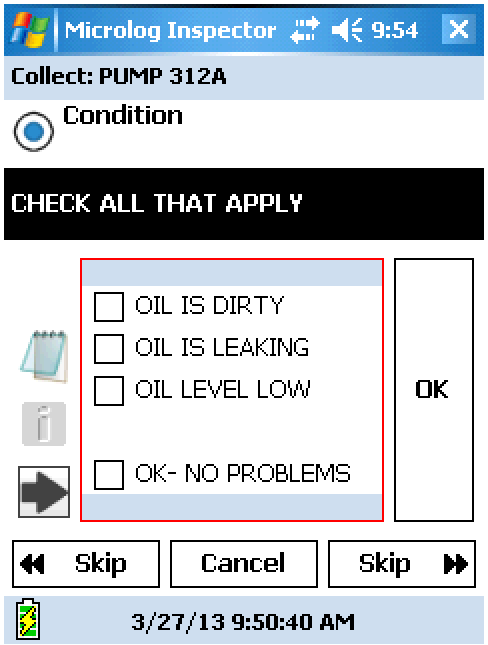
Collect: PUMP 304

○ Inlet Pressure
CIP - Fermenter 3

82.16 PSI

New Data Entered

Machine name on POINT



Collect: PUMP 312A

○ Condition

CHECK ALL THAT APPLY

□ OIL IS DIRTY
□ OIL IS LEAKING
□ OIL LEVEL LOW
□ OK- NO PROBLEMS

3/27/13 9:50:40 AM

High contrast mode option

Database backup and restore – the ability to backup and restore the device database

Improvements to scanning logic - when the same machine is used multiple times in ROUTEs

Stay informed with SMS Text messages or Simple Mail Transfer Protocol (SMTP) from @ptitude Inspector

By Robert Kaufman

The SKF @ptitude Inspector V7.0 software release has a great text and email feature that can simplify the sharing of time sensitive information. The Simple Mail Transfer Protocol (SMTP) is an Internet standard for email transmission across the Internet. It can operate within a secure corporate environment to email just to employees within your company or across the Internet using almost any common email service.

Once setup, this feature allows users to send or schedule notifications, email any generated report, and configure the Scheduler application to perform actions in response to changes in alarm conditions.

SMS (text) messages include the description of the alarm condition change in plain text, but without the attached report. Email and SMS messages can be sent to an individual person, or to groups of people. The email message format includes an HTML report along with a .PDF attachment so that even members of your team without access to an account in the SKF @ptitude Inspector software can receive timely and actionable information - that they can open on almost any device.

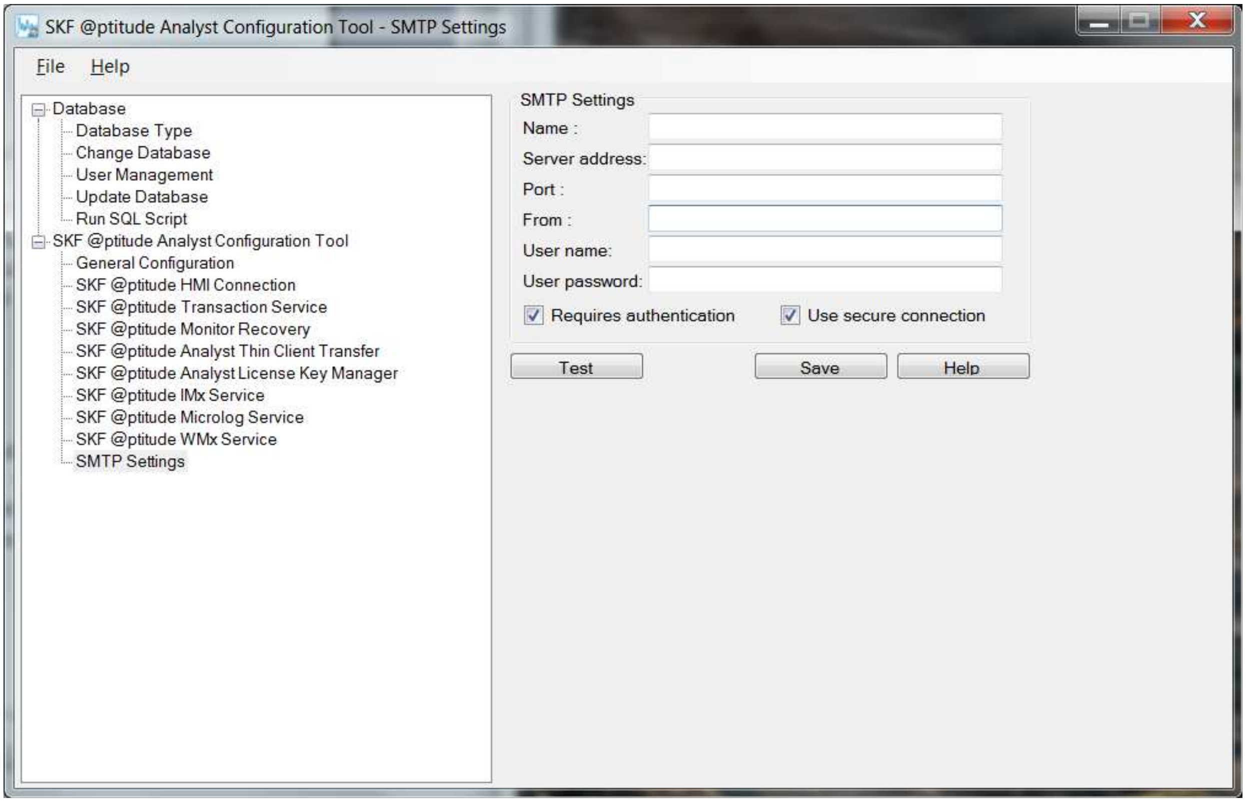
The setup of your SKF @ptitude Inspector V7.0 SMTP connections are very easy to perform provided that you can get some very basic SMTP server information from your company's IT provider.

In this article, I will focus on setting up the system to send messages within a corporate network. This will allow you to access the corporate mail services from **within** any of your company sites as long as they are within your companies firewall, or by connecting through the approved VPN mechanism to the corporate network. **This point is very important**. If the client application is located outside the company's network, any attempts to connect to the SMTP server using the SKF @ptitude Inspector Configuration Tool, or any attempts to send messages using the application through the SKF SMTP server, will fail.

SMTP settings for @ptitude Inspector e-mail and text messaging are first configured in the **SKF @ptitude Analyst Configuration Tool**. To access the configuration settings, follow the instructions below:

1. Go to **Start > Programs > SKF @ptitude Monitoring Suite > Admin Tools > SKF @ptitude Analyst Configuration Tool**.

2. Click on the **SMTP Settings** link in the left panel. [Figure 1.1]


SKF @ptitude Analyst Configuration Tool - SMTP Settings
File
Help
Database
Database Type
Change Database
User Management
Update Database
Run SQL Script
SKF @ptitude Analyst Configuration Tool
General Configuration
SKF @ptitude HMI Connection
SKF @ptitude Transaction Service
SKF @ptitude Monitor Recovery
SKF @ptitude Analyst Thin Client Transfer
SKF @ptitude Analyst License Key Manager
SKF @ptitude IMx Service
SKF @ptitude Microlog Service
SKF @ptitude WMx Service
SMTP Settings
SMTP Settings
Name :
Server address:
Port :
From :
User name:
User password:
Test
Save
Help

☑ Requires authentication ☑ Use secure connection

Figure 1.1. Configure SMTP Settings in the Configuration Tool

In the right panel, input your company's specific SMTP Settings as follows **in blue**:

Name: This name will appear in some e-mail clients receiving messages from @ptitude Inspector as the name of the message sender. The Configuration Tool requires that this field be filled in. It can't be left empty:

Enter any name as desired

Server Address: This text value contains the network address of the SMTP server that the @ptitude Inspector application should use to send e-mail messages. Depending on the environment where the software is being installed, this server may be either an internal location within an organization's private network, or a publicized public location for an external provider of e-mail service such as Google Gmail or Yahoo Mail. The address may be specified as either a domain name such as smtp.gmail.com, or as a valid IP address such as 74.125.137.109. The Configuration Tool requires that this field be filled in as well.

Type in the name of your server

Port: Contains the port number associated with enabling clients to access the SMTP server described above. The right port number to use depends on how an SMTP server has been set up by its owner, and will often be publicized for the benefit of authorized users. The Configuration Tool requires that this field be filled in with a non-empty numeric integer value:

Type in the port number provided to you by your IT support; example: 25

From: This text value contains an e-mail address that may appear in some e-mail clients as the originating address for messages that are sent from the SKF @ptitude Inspector application. The Configuration Tool requires that this field be filled in with a non-empty numeric integer value:

Enter any syntactically correct e-mail address

User Name: Contains the user or login name part of the authentication credentials used by many SMTP service providers to ensure that their services are only being used by authorized users. This field is required to be filled in by the Configuration Tool only if the “Requires authentication” checkbox is enabled:

(Leave this blank for internal mail setup)

User Password: Contains the password part of the authentication credentials used by many SMTP service providers to ensure that their services are only being used by authorized users. This field is required to be filled in by the Configuration Tool only if the “Requires authentication” checkbox is enabled:

(Leave this blank)

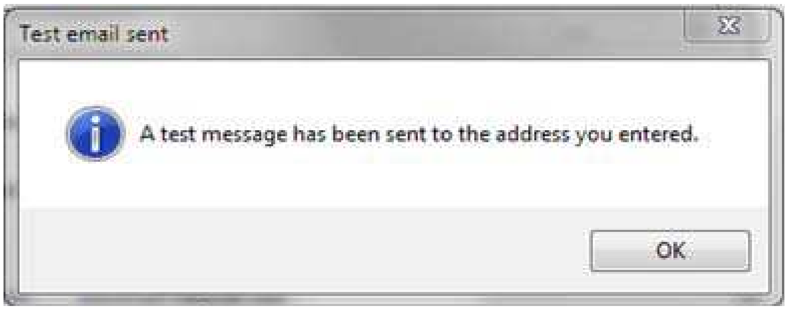
Requires authentication: Authentication usually consists of a login name and password combination. When this box is checked, the SKF @ptitude Inspector application will provide the user name and password described above as credentials to the SMTP server for authentication purposes:

(Leave this box unchecked)

Use secure connection: This box must be checked if the SMTP server uses standard encryption protocols to protect the security of sensitive information being passed over the network:

(Leave this box unchecked)

Click the **Test** button once complete and a dialog box will display asking for an e-mail address. Input the email address where the test notification will be sent to. For simplicity, I used my own corporate email message and then clicked send.   Once you confirm that you received the message, continue to the steps below:



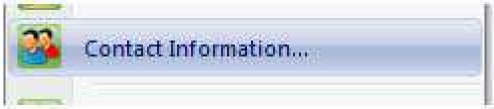
Test email sent

A test message has been sent to the address you entered.

A confirmation dialog will appear. Press **OK**. [Figure 1.2]

Filling in these simple steps will allow you to configure all of the mail and SMS (text) messaging options. Once the system is configured, you can then setup your contacts directly from within the SKF @ptitude Inspector application by selecting

Customize > Contact Information



Contact Information...