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Installation
& Technical Services

Manual

TOG System incorporating Anti Bio Technology



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PRODUCT EXECUTIVE SUMMARY

TelferTech Oil Rig System is designed as a preventive measure to benefit industries where operation is continuously affected by marine fouling.

Major issues such as high maintenance cost, operation deficiency, frequent breakdowns and shutdowns which lead to an overall inflated production cost can be greatly prevented.

Other benefits realized in the water treatment related application are savings in chemical usage, prolonging lifespan of filter media through biofilm removal, enhancement of filtration vessels, lowering maintenance cost and much improved treated water quality.

The TelferTech Oil Rig System TOG 5 which is comprised of two major elements: a control unit or panel and 5 activators. The Control Unit houses a circuit board incorporating a pre-programmed microchip that is patented worldwide.

The Controller functions in transmitting sonic waves to the Activators that are circum-mounted on the outside of the pipe work prior to filtration systems for water treatment; for anti-marine fouling application, similar circum-mounting of activators on the outside of pipe work above seawater level is applied, no part of the system is in contact with water.

The technology uses low frequency sound waves to effectively **REDUCE PARTICLE REPRODUCTION, RETARD FORMATION OF BIOFILM AND REPELL MARINE GROWTH.**

Each TelferTech Oil Rig System TOG5 consists of a Controller and five Activators that will provide complete treatment or protection to one site. There are several models available, TOG5, TOG10, TOG15 & TOG20.

The System is easy to install and is scalable depending on site requirement. TelferTech Oil Rig Systems are designed to Oil & Gas industry compliance with zero maintenance in mind except periodic checks to ensure the Activators are functioning which is displayed on the LCD screen on the Controller.

Every System has a two year warranty and an expected lifespan of 10 to 15 years.



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Description of the Work Scope

Installation

Installation of the TOG System is straight forward and simple to administer. This undertaking is normally done by qualified contractors.

A pre-installation site scoping is always encouraged for better understanding of the site conditions. During site scoping, please take as many pictures as necessary, take down records and pay special attention to the following:

- Pipe size for caisson(s) and riser(s)
- Piping materials; e.g. PVC or steel
- Number of caisson pumps
- Number of water treatment plants (if applicable)
- Number of filters in use (if applicable)
- Types of filters (if applicable)
- Water flow rate
- Power source
- Location(s) to house Control Unit(s)

Important factors to consider when installing the TOG System;

- Safety is paramount
- Installation approval is confirmed prior to any activities
- Positioning of the activators
- Positioning the control unit
- Power source
- Ensuring installation does not intrude on any other plant equipment already installed at the site.

Installation of the System Components:

TOG Control Unit

The installation of the TOG Marine System, will never compromise safety pre, during and post installation.



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From the pictures below, the TOG system is installed in a "safe zone" area usually on the sump deck and is fixed to a secure area where the TOG systems are mounted on a backboard plate secured to the structure.



TOG Computer system

Computer: Line up the computer box on the wall. Ensure that it is positioned straight and not like the leaning Tower of Pisa. Pre-drill holes in the wall surface for the computer to fix on to, however please note the wall structure as it can be concrete/timber/asbestos hence different structures require separate means of mounting. If the surface is concrete ensure you drill holes and utilize wall plugs.

Once you have pre drilled the holes into the surface it is now time to mount the system on the wall. Disconnect the cable tie from control unit. Now determine which wire is the power supply lead (wire with silver tag). On the power supply wire only, strip off the end to expose the raw wires within the lead.

This can be done by hand as the main power wire is already partially stripped for your ease.

Please note before the next step of removing the silver tag to ensure that you have not stripped the other main lead or otherwise you will not be able to differentiate between the two leads.



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Ensure that the Computer Box system is straight and secured tightly to the wall surface.

The power pack – the power pack is already installed in the box and the power wire coming out of the bottom of the box needs to be long enough to reach the power point, where a plug is fixed to the wire. Please ensure the wire from the Computer Box to the power plug does not have a break in the line and is sealed from one to the other.

All wires connected should be soldered and have protective heat shrink over the connection.

Now plug in the power pack to the power point and turn on. If your connection is successful you will observe the display light on the AB system flashing.



System power up:

If you have followed each procedure accurately your system should now be flashing "TOG 1" "Anti Bio Technologies" when it is powered up. Using your sound device you will be able to hear the frequency penetrating the pipe work.

If this does not happen and your system displays "Check coil", there is a problem with the connections. Please contact a TFT Technician for assistance.

If the system is not flashing, 1 of 2 things is not correct. You have either connected the wrong lead to the power pack, or the power point is out of order. In either case turn off the power supply and assess the situation and rectify the procedure. If you are unable to rectify the process please call a TFT technician.

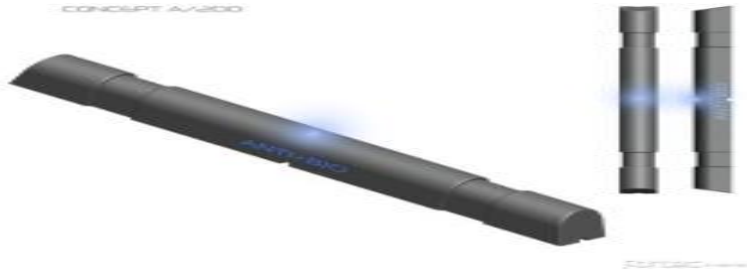


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Activators



When installing the Activators, ensure that the activators are positioned on the straightest section of the pipe and are evenly spaced parallel to one another around the pipe.

Activators will be connected through an Exe junction box to the activator cable from control unit near the site of treatment.





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METHOD OF APPLICATION

The two control units "TOG system" will be installed on the sump deck at the designated platform, from which one TOG system will service the jacket leg activators and the other will service the activators on one of the two steel plates, one connected to two activators and one without activator were lowered into the sea water by 3 meters depth to compare the effects of barnacle growth having a TOG Marine System installed (test plate) and without TOG (control plate).

For reference, this test exercise was previously conducted with Petronas Carigali, offshore with complete success, where the TOG system performed demonstrating barnacle growth on the control plate vs. test plate was clearly observed to conclude the test.

INSPECTION ACTIVITIES

Date	Name of Crews	Activity
16-01-2016 - 20-01-2016	John Grant Wake	Installation of TOG's & activators to jacket leg & trial plates
16-01-2016 - 20-01-2016	David Brian Telfer	Installation of TOG's & activators to jacket leg & trial plates

TEST OBJECTIVES

To demonstrate TOG system is able to reduce, minimize and/or eliminate barnacle growth colonies forming on the jacket leg.

To demonstrate TOG system is able to combat barnacle growth observed from the test plate when compared to the control plate.



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All works carried out at the designated platform was under the supervision from PPTEP's reliability team for the entire duration of this project. The trial executed was first discussed and agreed upon between PPTEP, OIM and TFT.

Installation Advice Report

You will receive an advice report stating what the installation requires from your sales department. You must ensure that the report is thorough in order for you to complete the installation process in the most professional, accurate and timely manner possibly.

Please remember that the clients' time is as equally precious as your own.

Other than the common details provided by sales for example;

- Site Name
- Operator/s
- Hours of operation
- Site instructions

You will need to identify the following:

- Pipe size for the Jacket Legs
- Piping structure - material?
- Is there any data for the Jacket leg maintenance available?
- Power source - is there power? Does power need to be organized?
- A power point is required.



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- Is the power point operational?

Once you have the answers to these questions you are ready for installation.

Rule of thumb for the time required for installation is as follows:

- After the Installation Advice Report is submitted and approved by the department in charge, a set time and date shall be confirmed to mobilize out technical team for the installation.
- Installation requiring 1 system and 5 activators will take approximately 2 hours for one caisson pump.
- Please note that the size of the pipes on an Oil Rig site can create variance.
- Additional time needs to be accounted for with all other issues pertaining to the installation such as site scoping and oil rig procedures for any work being carried out.

Jacket Leg Installation

The activators are placed just above the water surface level as illustrated in the drawings.

The positioning and the amount of the activators required may vary due to the amount of pumps/jacket legs and/or filters utilized at each site.

When attaching the activator it is imperative to have the end of the activator from which the cable extends facing the same direction as the flow of the water, i.e. pointing at the filter, not the pump.

Now position and space the activators straight and evenly around the pipe in a parallel position. Secure the activators in place by the large cable ties supplied in the box. Please ensure that the activators are secured on both ends.

Once secure, use the covering to be placed over the activators to seal the activators to the pipe.

Important note: once all wires are joined correctly, ensure the connection from every activator to the computer does not have a break in the line and is completely sealed from one end to the other.



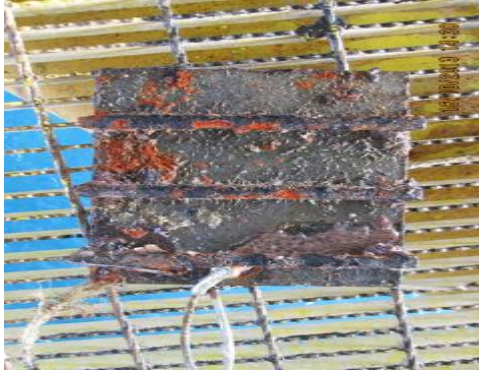
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Steel plate installation

The main objective of the trial plate is to demonstrate the test steel plate with the activator will have less barnacle and marine growth than the control steel plate without the activator.



Lowering the plates into the water

The steel plates have been fabricated to ensure they are sealed correctly; also we need to ensure the junction wire connection is above sea level and moving minimal, potentially avoiding intermittent signals previously experienced and also avoid any potential water threat entering this way down to the tubes.

Due to the hazardous environmental conditions, there are always some variables out of our control, hence we have never guaranteed that water would not find its way back into the tubes in doing this kind of test, however we have taken every precaution to ensure optimum conditions for the system to work correctly in this exercise.

Protection of Activators:

The system has been supplied with a covering wrap for protection of the activators. So once you have confirmed that your system is powered up and operational, place the wrap over the activators and around the pipe.

Work, Health and Safety:

Any work done that may be sensitive to site conditions shall be handled offsite when necessary prior to mobilization.

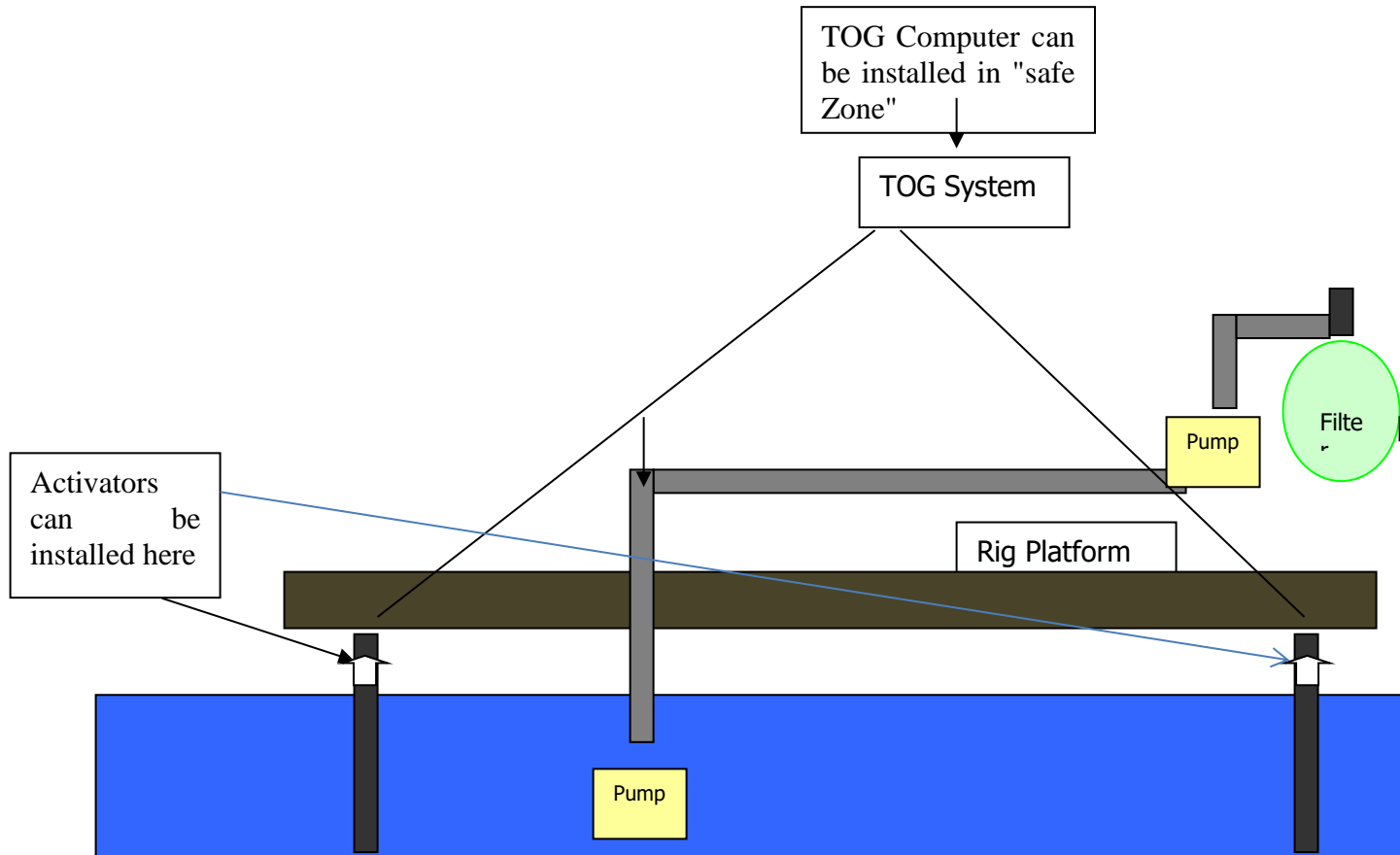
Please remove all of your equipment and ensure all of your wire off cuts, etc. are picked up and disposed of appropriately leaving the working environment clean and tidy.



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TOG System /Jacket Leg installation



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INSTALLATION

Installation of the System is simple. Due to site layout and unforeseen site limitation or restriction, we always propose to do the following before actual physical installation taken place.

1. Thorough study of site layout and infrastructure
2. Conduct site scoping to identify and confirm infected areas
3. Preparation of equipment and tertiary parts
4. Planning and execution
5. Training

D. MANPOWER

- We estimate number of manpower required for this job is 2 pax, from TFT;

Discipline	Number
Supervisor	1
Technicians	1

- Third party contractor equip with specialize skill and permits may be required;
- Mobilization Lead Time (number of days for notification) – 14 days; and
- All TFT staffs deployed are equipped with valid safety passports & shall be provided with appropriate PPE.

E. PROJECT SCHEDULE

A detail project schedule will be drawn after site scoping is completed. We anticipate installation shall take no more than four (4) days from commencement to completion, inclusive of mobilization of crews, without taking into account any occurrence of unforeseen delays such as bad weather condition, etcetera.



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3.0 Methodology

3.1 Marine Fouling On Jacket Leg

The demonstration will be for 1 year duration and further if deemed necessary.

- i. To take pictures on jacket legs before TOG is installed;
- ii. Install TOG;
- iii. Pre data established
- iv. Pictures taken from CCTV on the before TOG is installed on to jacket leg and steel plate showing level of marine growth contamination which shall be used as baseline measurement.

3.1.1 Objective defined

To demonstrate EFFECT of TOG to mitigate further marine growth on the jacket leg and steel plate with the activators installed.

3.1.2 During Demonstration Period and Post data records

PPTEP,Operation shall be responsible for:

- a) Arranging for pictures of caisson and strainer to be taken from CCTV;

Measurement of Success

Measurement of Success shall be determined by OBSERVATION from the picture taken in this exercise, that there is NO/or minimal further marine growth on jacket leg and steel plate post TOG installation.

4.0 Conditions, Liabilities & Termination

1. PPTEP Operation shall be responsible for the security of the TOG systems throughout the duration of the demonstration;
2. PPTEP Operation shall not adjust nor relocate any of the installed systems to any other locations without our prior knowledge and consent;
3. The safety seal on the TOG systems must not be tampered;
4. TelferTech Sdn Bhd shall bear no liability to any losses incurred at the site during the duration of the demonstration; and
5. Either party reserve the right to terminate this exercise upon serving a 48 hours due notice.
6. PPTEP Operation is responsible for the dismantling of the TOG systems when a termination notice is served.



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OTHER TERMS

Scaffolding works to be provided by Client should it be required.

Measurement of Success. This would be obtained from the outset by determining the clear target Objective being achieved from Pre and Post analysis.

Project Timeline

Table below showed the project timeline and progress for the TOG Marine System & Trial Plate Inspection.

Date	Activities
14 June 2016	2 pax of TFT team mobilized from Bangkok to designated Platform. Prepared Permit to Work. Performed an Inspection for TOG Anti-Bio Marine System.
14 Dec 2016	Finalized the Finding & Close Out Report .

We trust all the above will meet your kind consideration and approval. Should you have any further queries, please do not hesitate to contact the undersigned.

Prepared by,

Agreed by,

Approved by,

.....

.....

.....

David Telfer
CEO / TelferTech Sdn Bhd

Reliability Engineer

Deputy OIM