



Adding Significant Strength and Life to Offshore Structures by ocean-powered Marine Growth Preventers

Propelled by continuous ocean waves and currents, IEV's proprietary Marine Growth Preventers (MGPs) can be deployed on existing structures to remove and prevent the formation of marine fouling, offering 100% efficiency in maintaining a "zero-growth" surface profile on protected members in the wave zone.

IEV's latest generation of MGP, known as the **MGP-i**, is designed with "**self-cleaning**", "**typhoon-proof**" and "**impact-proof**" features for applications in the wave zone to withstand extreme sea conditions. The **MGP-i** can be applied in areas which are subjected to constant impact forces against obstructions such as structural members at the sea deck level, crossed braces and other auxiliary components. This patented product can be retrofitted from the topside to remove existing marine organisms and prevent its regrowth in one single deployment. Effective on offshore platforms, wind farms, jetties and terminals, the **MGP-i** can be installed on both new and existing facilities.

IEV can offer a study called **Marine Growth Sensitivity Study (MGSS)** to analyse and quantify the benefits of installing **MGP-i** on the wave zone of specific structures. The results of **MGP-i** application on typical process, wellhead, production and accommodation platforms are summarised in the following table:

Platform	Configuration	Function	Water Depth	% average reduction in Base Shear	% average reduction in Overturning Moment	% average improvement in Pile Safety Factor	% average reduction in Unity Check	% average improvement in RSR	% average improvement in Fatigue Life
Platform A	4-legged	Wellhead	-74.5m	10.29%	13.67%	9.4%	8.7%	11.1%	50.5%
Platform B	8-legged	Process	-74.6m	14.4%	19.90%	8.1%	8.9%	31.11%	51.3%
Platform C	6-legged	Production & Quarter	- 22.5m	26.3%	25.10%	9.84%	20.12%	17.83%	8.8%

With such significant gains in structural benefits, the **MGP-i** application is an effective way to recertify the platforms for "**Fitness for Service**" with reduction in hydrodynamic loads,

allowing for both **Life Extension** and increase in **Structural Capacity** of offshore assets. Similarly, installation of *MGP-i* on new built platforms will directly result in lowering overall substructure weight, and consequently, fabrication and installation costs.

Within days of installation, the *MGP-i* remove existing marine organisms and permanently maintain a zero-growth profile throughout its life, and in doing so it reduces the drag coefficient C_d to that of a smooth profile. This zero-growth profile achieved on structures in the wave zone offers a trade-off benefit and allows the thickness of marine fouling below the wave zone to grow even beyond its design allowances without affecting the structural integrity of platforms. This leads to either reduction in cleaning frequency or complete elimination of cleaning requirements. As it is not necessary to deploy divers and vessels to achieve this permanent change in marine growth profile, the *MGP-i* represents the world's lowest cost structural integrity management (SIM) solution commercially available to date.

The MGP was recognised in **API RP 2SIM Recommended Practice for Structural Integrity Management of Fixed Offshore Structures**, as a measure to reduce hydrodynamic loads: ***“Such measures may include installation of sliding marine growth preventers and/or adding periodical removal to the SIM program for the platform”*** (Section 13.3.4.2.3, pg 53, API RP 2SIM, First Edition of November 2014 publication).

Manufactured in Malaysia for over 30 years now, more than 33,000 MGPs have been installed on over 500 new and existing offshore structures worldwide. Since the launch of *MGP-i* in Year 2014, more than 1,200 *MGP-i* units have been installed on over 70 offshore structures and jetties.

For further information on the MGSS, please contact info@iev-group.com.