



Being Green: Seeing Good Returns Without Rose-Coloured Glasses

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“Green” is arguably the watchword in today’s global economy.

Shareholders, customers, regulators, and others demand products and services that are environmentally friendly, yet as effective as their precursors. For oil and gas companies, particularly those with operations offshore, choosing the green alternative has often meant sacrificing desirable features and benefits. Moreover, integrating a greener approach frequently requires making costly and unforeseen modifications to current operations.

Enhancing the already enviable environmental record of the offshore exploration and production industry need not diminish the bottom line.

GREEN YET EFFECTIVE

Many large E&P companies have found a greener approach to preserving and extending the life of structural assets—and ultimately boosting profitability. The US-based company Sponge Jet, Inc., has developed abrasive blasting products called “Sponge Media” that remove disruptive and time-intensive protective coating maintenance from the critical path of operations. The blast media’s green credentials stem from its ability to greatly reduce dust, destructive rebounding, and the problematic and costly matter of waste disposal.

Unlike conventional abrasives, Sponge-Jet’s composite blast media acts as both an abrasive and a sponge: it removes paint from metal surfaces as effectively as conventional grit, but its unique structure enables it to do so in a manner that nearly eliminates dusting and re-bouncing. The sponge abrasive consists of grit encapsulated in porous, spongelike urethane. When specialised feed units propel the abrasive to the surface, the blast media abrades the substrate in a controlled collision, rebounds, and returns to its former shape. In effect, up to 95 percent of what would contaminate the air as dust with conventional blasting becomes



Containment for sponge blasting

trapped by the pliant sponge media. Moreover, most of the used abrasive can be sent through a classifier multiple times to be cleaned and recycled.

Something as mundane as preparing a metal surface for painting directly impacts profitability. Consider the actual cost of shutting down a production platform that extracts 40,000 barrels of oil per day when oil prices are US\$75 a barrel; the daily cost of a shutdown can exceed US\$3 million. Shutting down operations to conduct coating maintenance can cost well over US\$100,000 per hour.

Thanks to green surface preparation with sponge blasting, Petrobras recently gained forty additional hours of production time from Platform P-37 in the Marlim field offshore Brazil. According to Petrobras closing execution co-ordinators, a scheduled multi-day maintenance closing for P-37 called for removing fibreglass coatings and oil from sensitive areas. Surface preparation with encapsulated abrasive media rather than conventional grit allowed Petrobras to open Train A 41 hours and Train B 33 hours ahead of schedule. At the time of the project, the value of two days’ production was US\$12 million.

DIRECT AND INDIRECT COST SAVINGS

Improving efficiency, reducing waste, and limiting required resources dictate how green a product is. Few processes expend so much to achieve so little as conventional surface preparation. A recent productivity test on another Brazilian platform revealed that surface preparation using conventional grit technology expended 5,000kg of abrasive during eight total hours of blasting. The amount of abrasive that actually struck the surface was 200kg/m². On an adjacent surface in the same tank, sponge blasting expended only 54.6kg of abrasive during those eight hours, and used 2.55 kg/m² of media. According to onsite Painting Inspector Ramacy Junior and Chief Inspector Raimundo Gomes, the volume of media used with the encapsulated abrasive media system was 1.1 percent of the total media used for grit blasting.

Petrobras also discovered that sponge-blasting can cut labour costs. On the platform mentioned in the preceding paragraph, the company found that using encapsulated abrasive media effectively decreased its labour requirement for the application by 60 percent. The labour force reduction corresponds to the night shift



Note the lack of dust, enhanced visibility and the operator's real-time inspection of the surface

that would otherwise have had to dispose of residues. Consistent with other sponge-blasting experiences worldwide, the reduced volume of abrasive yielded savings in material handling, transport, clean up, storage, and disposal. Blasters and painters — not a separate night cleaning crew — managed both abrasive cleaning and recycling.

One cannot overstate the value of dust reduction. In conventional blasting, dust comprises fractured abrasives and pre-existing surface contaminants travelling excessive distances at high speeds. To protect equipment and personnel, it is necessary to install containment and dust control systems. Erecting these systems is time-consuming and costly, but it reduces grit intrusion in pumps, air intakes, compressors, and rotating equipment. When equipment prematurely fails, grit intrusion from blasting is often the culprit; abrasive blasting can directly affect process and equipment reliability. The sponge component in encapsulated abrasive media reduces collision energy, drastically reducing ricochet damage, and fugitive

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abrasive dust. It eliminates the harmful and destructive results caused by conventional dry abrasives.

Using sponge media also provides an offshore operator less tangible, indirect benefits that can bolster the organisation's non-market strategy — specifically its approach for dealing with pressure from environmental watchdogs and workplace safety and other regulatory entities. Blasting is a necessary operation, and sponge blasting mitigates risks to personnel, equipment, and the environment. In terms of labour-related health issues, sponge blasting offered a

considerably safer workplace for a Petrobras lead materials specialist with extensive conventional blasting experience.

"Compared to garnet blasting, dust control is simplified, intrinsic risk of eye injury is reduced ... and work conditions for adjacent crafts/units are improved", he said. In the area of regulatory compliance, sponge blasting can lead to a reduction in agency fines and citations relating to abrasive blasting dangers. A company that commits to reducing dust emissions, enhancing employee safety, and preserving assets, can present these facts to various stakeholders in a positive and controllable way.

The disruptive nature of conventional blasting does not end with harmful and damaging fugitive emissions. Take scheduled maintenance, for example, where several trades are concurrently working nearby to minimise shutdown time. Scheduling abrasive blasting interrupts trades such as welding, electrical, and engineering. When one multiplies the aforementioned US\$100,000-per-hour shutdown cost across, say, 25 platforms, \$2.5 million an hour adds up very quickly. The choice of surface preparation can have a pervasive and critical effect on the bottom line.

MAXIMISING PROTECTIVE COATING LIFE

It is debatable whether protecting platform assets is more important than deriving value from reducing shutdowns, or vice versa, but the primary purpose of surface preparation is clearly to maximise protective coating life. The same low-dust and low-rebound features built into sponge, help to maximise coating life. Because the low-dust of the process attribute impairs visibility much less than conventional blasting, blasters can perform more consistently and inspect their work on a real-time basis. Sponge blasting's low-rebound attribute reduces blaster fatigue, creating a worker environment that is more comfortable, more productive, and safer. The sum of these two characteristics simplifies the process of achieving a clean surface, while promoting longer-lasting protective coatings that reduce the frequency of coating-related maintenance shutdowns.

Asset protection is important, but the ultimate goal is preservation. Less time spent replacing steel translates into a safer, more productive workforce and a more profitable operation. Using a recyclable abrasive that generates far fewer fugitive dust emissions demonstrates good environmental stewardship. ■



Uncommon to conventional abrasive blasting, two sponge media blasters can work safely and efficiently together.