

## COMPOSITE REPAIR FOR PIPE REINFORCEMENT

According to ISO 24.817 & ASME PCC-2

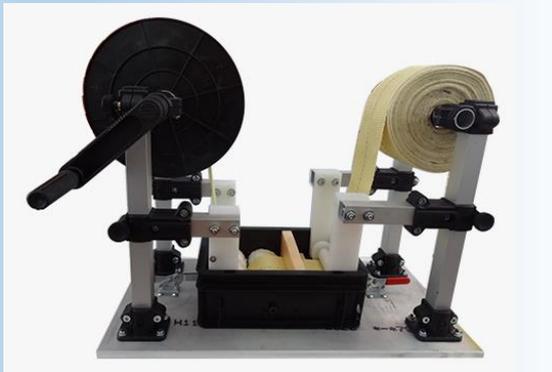
DEFECT TYPE	Corrosion	PIPE DETAILS	16" water line
LOCATION	NIGERIA		
3X SOLUTION	REINFORCEKIT® 4D-EC using BOBiPREG®		

### OVERVIEW

The objective of the job, performed in August 2018 by 3X ENGINEERING (3X) and its local distributor SAVIC, was to protect a 16" pipe from aggressive environment on several long sections (for a total of 70-meter length).

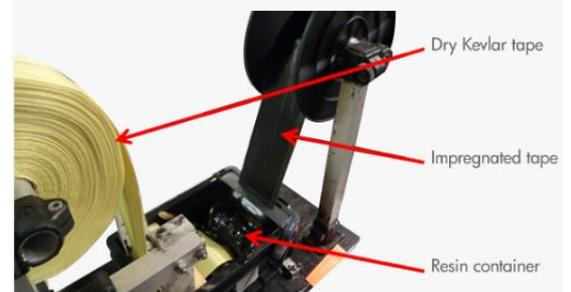
### SCOPE OF WORK

The reinforced protection was performed in a yard, prior on-site assembly, using BOBiPREG® machine. This specific machine, designed by 3X, allows a quick and regular impregnation of the Kevlar® tape with the resin before application.



Figures 1 & 2:  
BOBiPREG machine and  
how it operates

How does the BOBiPREG® work?



This pre-preg system was very convenient for this case because the REINFORCEKIT® 4D-EC application should be carried out as fast as possible. The reinforced protection was performed following 4 stages:

- 1 Surface preparation of the pipe using sandblasting to get at least 60 µm roughness and thus ensure a good bonding between the pipe and the composite.
- 2 Kevlar® tape impregnated with R3X1060 resin using BOBiPREG®.
- 3 Wrapping around the pipe using 3X specific handles to ensure proper tensile strength during application. This device will facilitate and speed-up the wrapping step. Four layers were applied to guarantee an optimal protection.
- 4 Finalization of the protection with reference plate positioning for traceability purpose.



Figure 3: Kevlar tape impregnation with resin using BOBiPREG



Figure 4: Composite wrapping on progress using specific handles



Figure 5: Reinforced protection finalized with reference plate installation

### RESULTS

Initially developed for subsea application, BOBiPREG® machine is proving to be also very efficient in this onshore configuration. This application method added to onsite conditions offer many benefits:

- easier logistic & safer environment (implementation environment performed in a yard rather than a platform).
- efficiency increased & cost effective (the wrapping was performed four times faster than with traditional method).