UHPC in offshore

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UHPC is through its properties, such as high e-modulus, high strength, and low permeability excellent for rehabilitation, protection and strengthening of offshore structures.

Splash zone protection

The splash zone is without doubt one of the more aggressive environment for wood, concrete and/or steel. Here you have the movement of the water inducing wear on the structures, high level of oxygen inducing a perfect corrosive environment. In salt water chlorides are present all over but combined with good access of oxygen this zone is where the problem is.
In icy regions ice sliding by a structure will tear and wear the structure. UHPC is here an ideal protection layer.
Splash zone protection is in general made on pillars standing in water, and is made by creating a mold around the pillar and cast the UHPC into the mold. When the UHPC has set the mold can be removed.
In case of wood pillars wood will usually rot over time, leading to insufficient load bearing capacity of the pillars. A mold can be placed around the pillar and a UHPC pillar is created by casting.

Oil and gas platforms

When oil is pumped out of the ground the buttom of the ocean will sink, which means that the platform itself will sink slowly. As the ocean will cover more and more of the legs of the platform the wave forces influencing the platform will increase over time. Eventually the strength of the platform is not high enough to sustain heavy storms.
The strengthening of the platform is done by filling the legs or part thereof with UHPC. This will stiffen the structure and increase the strength of this. By special engineering it is possible only to fill part of legs, ie areas of the connections of the steel.

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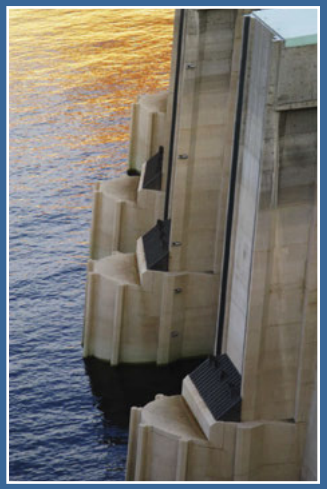
Wind turbine foundations

When building wind turbines the most common way of doing this is to place a mono pile in the ocean bed and then build the wind turbine on top of this monopole. However in order to secure that everything is straight a transition piece is placed on top of the mono pile.
The UHPC is here used as a bonding material between transition piece and mono pile. As UHPC has a very fast strength increase it is possible to increase the erection speed of the wind turbines, as UHPC in general reaches more strength in 24 hours than concrete does in 28 days.

Anchoring

When the water is deep, it is no longer possible to put a monopole in the ocean bed. Here a tripot system is usually used. The UHPC can here be used as an anchoring material much in the same way as it is done with the mono pile.



Harbour fronts

Harbour fronts are usually subjected to splash zone issues a long with the occasional impact by ships. Splash zone issues being hammered with ice and debris and of course the corrosion from salt, water and oxygen.
UHPC has the necessary strength and impact resistance to withstand these forces and the impermeability of the UHPC prevents chlorides, water and oxygen in penetration the protection layer which makes corrosion impossible.

Dams

Especially the slides of a dam are subjected to high amount of wear as a very high volume of water is running over these. The UHPC can easily withstand this water.
In the lake in front of the dam, the dam will be subjected to impact by debris, which can deteriorate concrete. Placing a layer of UHPC will end the deterioration.

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WPE provides high performance solutions to customers in accordance to international laws and quality systems.

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Development of new products and product solutions has always been a key activity of WPE. The focus on innovation and development has led to numerous products and concepts, all based on WPE Ultra High Performance Concrete.

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