ICPC Recommendation

Recommendation No. 15

Procedure to be Followed Whilst Marine Aggregate Extraction, Dredging or Mining is Undertaken in the Vicinity of Active Submarine Cable Systems

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1. INTRODUCTION

This document recommends the procedures to be followed whilst marine aggregate (sand/gravel) extraction is undertaken in the vicinity of active submarine cable systems, however the basic principles are applicable to all seabed surface mining and dredging operations.

Marine aggregate extraction, dredging or other forms of disturbance to the sea bed (including capital works for coastal defence, navigation or land reclamation) can pose a serious threat to a submarine cable system even if it was well buried during the installation process. The use of powerful Trailing Suction Hopper Dredgers (TSHD) is of particular concern to the submarine cable industry because some TSHDs are able to extract up to 46,000 cubic metres of aggregate/sediment per cargo.

At the end of 2013, the available records of the submarine cable industry worldwide show that at least 34 cable faults have been caused by aggregate extraction or other seabed extraction activities (e.g. mining or dredging) during the last 30 years.

Whilst this ICPC Recommendation considers the impact of extraction or mining activities on existing submarine cables, it is also important to consider such activities when cables are being planned or repaired with particular reference to the direction of cable laydown associated with final bites or alter courses.

In summary, there is an increased risk of submarine cable systems being damaged and/or exposed when any seabed extraction operations are conducted in the vicinity of active submarine cable systems. All parties would therefore benefit if such operations are conducted following consultation and agreement on acceptable parameters/control mechanisms and with due regard to known risks, hence the purpose of this ICPC Recommendation.

2. ASSESSMENT OF RISK

There is an obvious threat to cable security as a result of direct impact during aggregate extraction or other seabed extraction operations. There is also a potential indirect threat to cable security if buried submarine cables are left exposed on or near the surface of the seabed as a result of such operations. This can happen during the actual operations or sometimes due to sedimentary movements after the operations have taken place.

2.1. Direct Damage to Submarine Cables

Most marine aggregate extraction or dredging activities takes place in relatively shallow water, where submarine cables will normally be protected by armouring. However, the sheer size, power and mass of some extraction equipment is usually sufficient to damage even a heavily armoured submarine cable, should physical contact be made. A review of the proposed extraction equipment, frequency and sediment type being dredged should quickly indicate if there is cause for concern.

2.2. Sediment Transport and Exposure of Submarine Cables

It is widely accepted that the extraction of marine sediments can result in the movement of seabed sediments as a result of local changes to the hydrodynamic regime. It follows that buried submarine cables could be exposed if such activities are conducted in the vicinity. The degree to which sediment transport may be modified following an extraction operation will depend on the following factors:

- General wave and current activity in the area. The stronger the wave activity and current the more likely migration will be. Prevailing sediment movement patterns may also increase or decrease the impact of extraction;
- Depth of water. The shallower the water the stronger the effect of waves and currents and the more likely migration will be;
- Nature of sediments. Fine sands and silts will be more likely to be affected by local hydro-dynamic alterations than coarser, denser, sand and gravels;
- The relationship between the local hydrodynamic processes and the sediment resource that is being dredged. If the seabed sediments are highly mobile, then a dredged depression may result in increased levels of sediment transport as the depression is naturally filled. This process may draw sand away from buried cables and reduce their level of protection, with the potential for a long term loss of burial if the sediment resource is not subject to natural replenishment. In more stable seabed sediments (such as coarse sands and gravels), the dredged depression may naturally remain, and the local alterations to hydrodynamic processes may not be sufficient to further mobilize the remaining seabed sediments.
- The volume of aggregate to be removed. The greater the volume of aggregate to be removed the greater the potential change to the local bathymetry and hence a greater risk of alterations to the local hydrodynamic processes and associated sediment transport processes.

It is therefore difficult to be specific with regard to a ‘safe distance’, however it is generally considered that unless the dredger or mining vessel is using the Global Positional System (GPS), anything less than 500 metres separation between the extraction zone and a submarine cable would be cause for concern unless notional distances have previously been agreed.

In order for aggregate extraction and/or other seabed extraction operations to be authorised it is a requirement in most developed countries to carry out an Environmental Impact Assessment (EIA). Such a process is highly recommended in all instances of seabed aggregate extraction in order to understand and minimize the risk of changes to local sediment transport regimes and the consequent implications for exposure of submarine cables.

2.3. Regional Considerations

The regulatory and physical approach to marine aggregate extraction and/or other seabed extraction operations varies significantly throughout the world. In some jurisdictions, marine extraction is very stringently controlled and monitored, requiring licences and permits and in some cases electronic

monitoring of activities, usually via GPS transponders such that the location and activities of extraction vessels can be recorded and monitored. Clearly under such a regime the risk of a direct hit is much reduced, however the impact of post extraction sediment movement should still be considered.

However in many regions, extraction is less well regulated and it is in these regions that the Maintenance Authority (MA) must be careful to ensure that procedures are agreed and risks to cables mitigated.

Unfortunately in some jurisdictions there are well-documented cases of illegal extraction, where of course it will be virtually impossible to locate and/or control the Contractor.

Additional guidance on best practice may be developed between specific extraction sectors and the submarine cable industry, which is often achieved via their respective national representative bodies. Such interaction between extraction activities and submarine cable interests will help to facilitate the development of a national approach towards management, regulation and control. Where national guidance has been agreed between a national cable protection committee and a national extraction sector, this may in turn inform and guide the interaction between the respective interests over and above the guidance given in this ICPC Recommendation.

3. PROCEDURE

Depending upon the regulatory framework and controls in the locality, the following procedures should be applied for aggregate extraction or dredging, however they apply equally to other seabed extraction and mining operations.

It should also be noted that whilst the guidelines is based around a contractor and project scenario it is acknowledged that many extraction operations are licenced over long periods (up to 15 years in some cases). Therefore much of this Recommendation's content can equally be applied to such long term operations but obviously in such situations a more relationship approach with regular dialogue is required.

3.1. Prior to Work Commencing

The marine aggregate extraction or dredging project Contractor (Contractor) responsible for extraction work within one nautical mile of an active submarine cable system shall discuss the proposed plans with the affected submarine cable Maintenance Authority (MA) in order to determine the potential impact of the planned operation on the active submarine cable system. Due regard needs to be taken of the effects of seabed sediment transport/scour caused by the extraction work on the stability of the seabed area in the immediate vicinity of the cable route. It is recommended that a marine EIA is carried out prior to extraction operations taking place.

Where the planned extraction zone is within 500 metres of the charted route of a submarine cable system, the MA (unless otherwise agreed by all parties) shall normally require the Contractor to

adjust the positions of the permitted extraction area such that a minimum separation of 500 metres is achieved at all times during dredging operations.

The Contractor shall work with the MA to accurately identify the current physical location of the cable systems in the vicinity of the planned extraction zone(s). Depending on the circumstances the cable location work may require either side scan sonar, divers or a Remotely Operated Vehicle (ROV) in order to positively identify the location of the cable. If deemed necessary due to the nature of the work and the region, the location of the cable(s) should be marked with buoys. The cost of this location work shall be to the Contractor's account.

Prior to the commencement of extraction operations the Contractor shall provide the MA with a copy of the Contractor's marine operations procedures for the planned extraction activities. These procedures shall incorporate safety precautions with respect to both the detection and avoidance of submarine cables, and the safe and proper handling of the dredge suction head so as to ensure no accidental deployment outside of the licensed dredge area.

The Contractor and MA shall designate Project Coordinators (and deputies) for the duration of the work. All correspondence relating to the work shall be sent between these people. The designated staff shall be contactable 24 hrs per day in case of an emergency.

When the planning of the extraction zone(s) has been completed, the Contractor shall advise the MA Project Coordinator of the agreed scope and timing of extraction operations planned to be undertaken within the vicinity of the cable(s).

The MA shall ensure that the Contractor is aware that the Contractor shall be liable for the direct costs (cable repair) and indirect costs (e.g. traffic restoration) of any cable damage arising from the extraction works undertaken by the Contractor or their sub-contractors. The Contractor should arrange and demonstrate adequate insurance to cover this risk.

3.2. Immediately Prior to Work Commencing

It is recommended that if the works are proposed within 1km of a cable system the Contractor Project Co-ordinator shall advise the MA Project Co-ordinator that work is about to commence and provide the MA Project Co-ordinator with an emergency contact number (usually of the work vessel undertaking the extraction work) in order to allow the MA Project Co-ordinator to request that the work is immediately halted should an emergency situation develop.

3.3. During the Work

The Contractor Project Co-ordinator shall keep the MA Project Co-ordinator informed of the work progress, and in particular any variation to the work plan previously notified/agreed.

At least 48 and 24 hours advance notices shall be given for any extraction operations within 500 metres (unless otherwise agreed) of an active cable system. This will allow the MA Project Co-ordinator to arrange special monitoring of the cable system performance while the extraction work is being undertaken in close proximity to the cable system.

The Contractor shall ensure that the vessel(s) maintain at all times, in reasonable detail, a positioning log as well as track plot data and provide such information to the MA upon request.

The Contractor shall ensure that the extraction vessel(s) at no time deploy anchors or any other navigation device that penetrates the seabed within 500 metres of the location of a submarine cable unless previously agreed with the MA, e.g. an approved anchoring plan.

In the event that a cable repair operation is required to be undertaken on a cable in the vicinity of extraction operations, the Contractor shall ensure that the Contractor's vessel(s) keep clear of the area at a distance of 1(one) nautical mile for the duration of the repair and allow the repair operation to proceed without hindrance.

If deemed necessary the MA shall provide (and the Contractor shall allow) a MA representative to be on board the work vessel during the extraction works in order to oversee the operation and ensure that it follows the agreed plan.

3.4. After the Work is Complete

The Contractor shall promptly advise the MA of the completion of the work.

The Contractor (unless otherwise agreed) shall within 90 days provide the MA with the new bathymetry and seabed features maps in the vicinity of the cable clearly displaying the topography of the seabed over the area affected by the aggregate extraction, mining/dredging.

4. REFERENCES

Document Number	Title
Reference 1	Recommendation No 7 - Procedure To Be Followed Whilst Offshore Civil Engineering Work Is Undertaken In The Vicinity Of Active Submarine Cable Systems.
Reference 2	Recommendation 8 - Procedure To Be Followed Whilst Offshore Seismic Survey Work Is Undertaken In The Vicinity Of Active Submarine Cable Systems.
Reference 3	MAFF (Ministry of Agriculture, Fisheries and Food - UK), Guidelines for assessing marine aggregate extraction. Laboratory Leaflet Number 73. J.A. Campbell.
Reference 4	Coastal Defence and Marine Aggregate Dredging off the UK. Dr Andrew Bellamy. British Marine Aggregate Producers Association (BMAPA).
Reference 5	Regional seabed sediment studies and assessment of marine dredging. AH Brampton & CDR Evans.
Reference 6	ICES WGEXT guidance on EIA for marine sediments.

5. DEFINITIONS

The following words, acronyms and abbreviations are referred to in this document.

Term	Definition
CONTRACTOR	Aggregate Extraction Company/Dredging Project Contractor
MA	Maintenance Authority (Cable owner/s representative)

6. WEBSITES

- World Organisation of Dredging Associations (www.woda.org)
- European Dredging Association (www.european-dredging.eu)
- International Association of Dredging Companies (www.iadc-dredging.com)
- Central Dredging Association (www.dredging.org)
- www.dredgeline.net (Online bibliographical reference database)
- The International Journal of Dredging, Port Development and Ocean Technology (www.portengineeringmanagement.com)
- Institute of Materials, Minerals and Mining (www.iom3.org)
- http://www.marinet.org.uk/campaigns/scientific-studies (Scientific Studies from around the world on the erosion resulting from offshore sand and gravel dredging).
- British Marine Aggregate Producers Association (www.bmapa.org)
- http://www.publications.parliament.uk/pa/cm199900/cmhansrd/vo000614/debtext/00614-42.htm
- http://www.marinet.org.uk
- www.ices.dk