Challenges with measuring pH and DIC in coastal waters

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Case #1 summary

Problem: Cable and connector failure

Description: Cable with a thin rubber jacket leaked, RMG dummy plug leaked damaging the connector and shorting out the electronics

Solution: Used a cable with a polyurethane jacket; replaced the CTD with another CTD and sent the damaged CTD back to the manufacturer for repairs

Lessons learned
/Best Practices: Stick to polyurethane, it’s tough. Be careful about recycling cables. RMG connectors are not reliable in longer-term deployments. Always ensure everything is greased, even if it came from the manufacturer.
Cable:
A small nick was found in the rubber jacket. The nick allowed seawater to penetrate and wick up the wires.
Case #1 Problem

Connector:
The RMG dummy plug on the extra analog channel of the CTD leaked, eventually corroding the pins and damaging the analog channel.
Case #1 Problem
Case #1 description

- The problem was first noticed as unstable data on the pCO2 sensor. After approximately 6 months into the deployment communications was lost to the pH/pCO2/CTD sensor package.

- In this deployment weekly bottle samples were being taken. It was decided to pull the package out of the water and do an inspection back at the shop.
Case #1 solution

- The cable was replaced with a cable made with a polyurethane jacket

- To continue with the 1 year verification/assessment of the pH/pCO2 another CTD was used

- The damaged CTD was sent back to the manufacturer for repairs

- The connectors were inspected and greased before redeployment of the CTD after it was repaired
Case #1 lessons learned/best practices

- Using rubber-molded cables are a problem if the jackets are thin

- Recycling cables should be done with caution

- Best to use polyurethane

- RMG connectors are problematic, but other styles are too.
Case #1 lessons learned/best practices

- Seacon, Subconn, and Impulse micro connectors may be a solution, but they have their own issues
- Always make sure all connectors have been greased/lubricated
- This means around the lip seal as well for the RMG style
Case #1 lessons learned/best practices

**RMG-FS AND ASSOCIATED PARTS**  
**STANDARD RUBBER MOLDED**

**IN-LINE SERIES**

Note: Available with grippers, must specify.

Material: Special Neoprene, Molded  
Contacts: Copper Alloy, Hard Gold Plated per ASTM-B-488  
Voltage Rating: 600 VDC-contact factory for higher voltage requirements  
Pressure Rating, Mated: up to 20,000 psi

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RMG-1-FS  
1#10  
(Cable: 18/1SO) or Equivalent

RMG-2-FS  
1#10  
1#14  
(Cable: 18/2SO)

RMG-3-FS  
1#10  
2#14  
(Cable: 18/3SO)

RMG-4-FS  
1#14  
3#16  
(Cable: 18/4SO)

RMG-5-FS  
1#14  
4#16  
(Cable: 18/5SO)

RMG-6-FS  
1#14  
5#16  
(Cable: 18/6SO)
Case #1 lessons learned/best practices
Case #2 summary

Problem: Instrument package pulled off of docking station by prawn fishers, entangled prawn trap floats

Description: Prawn fishers coming within the protected zone of the Ocean Technology Test Bed buoy moored in the Saanich Inlet and becoming entangled in the instrument platform moored off of the buoy

Solution: Removed the mooring after the 1 year verification/assessment deployment was completed

Lessons learned
/Best Practices: Important to carefully assess a mooring location before committing to a deployment. Take ownership of the mooring plan and the details.
Case #2 Problem

An instrument package docked at 23 metres below the ocean surface in a 90 metre deep area was often pulled off its mooring or became entangled in prawn trap lines.
Case #2 Description

• The instrument package was moored within the boundaries of a moored surface buoy (Ocean Technology Test Bed) at a depth of 23 metres in a 90 metre deep area.

• The mooring was designed for easy deployment and retrieval of the instrument package

• Provided the ability to take water samples near the sensors. This was part of the verification process.
Case #2 Description

- The surface buoy (Ocean Technology Test Bed) is listed on marine charts, there is a notice to mariners, and there are clearly labeled warning signs on the buoy itself to stay outside of the mooring lines marked by surface floats.

- The instrument mooring was not marked
Instrument package mooring on OTTB
Entangled prawn trap floats
Case #2 solution

The instrument mooring was removed after the 1 year deployment test was completed.
Case #1 lessons learned/best practices

• Not knowing the details when someone else organizes a location for a mooring isn’t a problem until your deployment is compromised.

• Take ownership of the plan and the details

• Using an unmarked subsurface mooring is asking for trouble

• Important to carefully assess a mooring location before committing to a deployment. This means understanding who else is using the area and for what purpose
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