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The Blue Stream Deepwater Pipeline Project

San Donato Milanese - September 30th, 2003



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Blue Stream - Project Description

A direct connection between Russia and Turkey. Two Seelines trough the Black Sea and a large Compression Station.

CLIENT:	BSPC bv
LOCATION:	Black Sea
LENGTH:	390 Km
PIPELINES :	2 x 24"
WALL THICKNESS:	31.8 mm
STEEL GRADE:	448 SF
LINE PIPE QUANTITY:	171.000 t (each)
MAX. WATER DEPTH:	2.150 m
PIPELINE DESIGN PRESSURE:	267 bar
MAX INLET PRESSURE:	250 bar
COMPRESSOR STATION:	180 MW (4+2 TC)





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Blue Stream Organisation

Eni-Snam

Gazprom

50%

50%

Blue Stream Pipeline Company

Construction Consortium

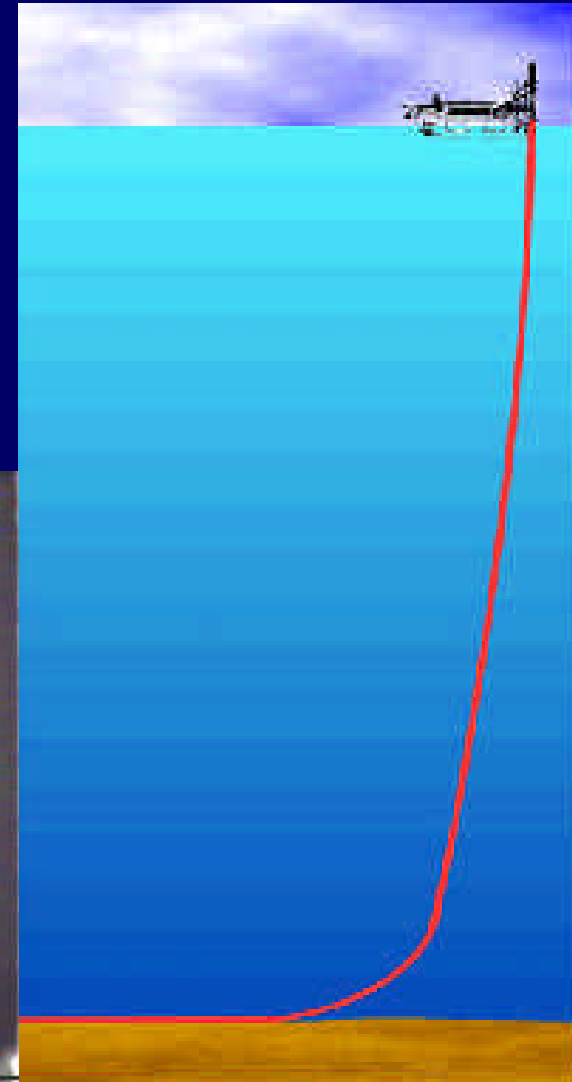
- Saipem Pipelines Construction
- Bouygues Offshore Compressor Station
- Katran-K
- Itochu Pipe Manufacturing
- Mitsui
- Sumitomo



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Key Elements

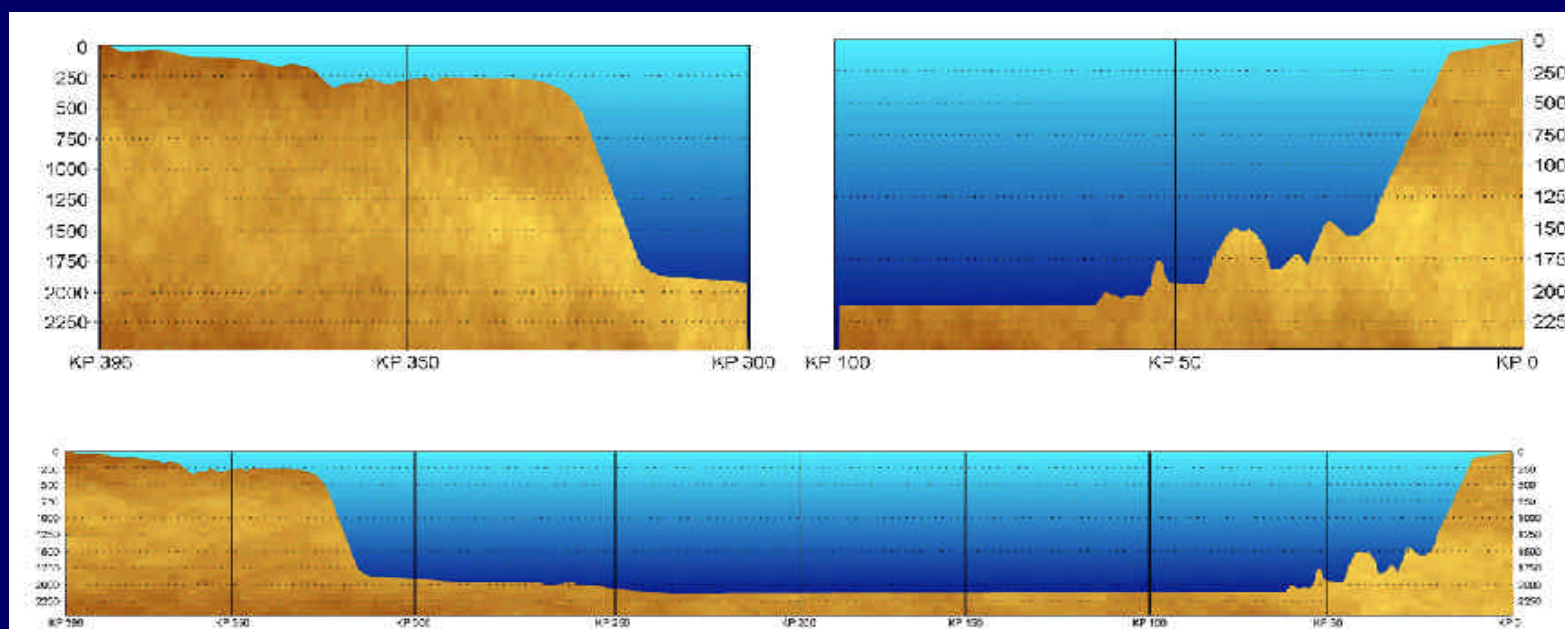
- ◆ Ultra deep water
- ◆ H₂S rich environment
- ◆ Geohazards



Seabed profile

Turkish slope

Russian slope





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SAIPEM 7000 equipped to J-lay





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H₂S Rich Environment

CORROSION PROTECTION

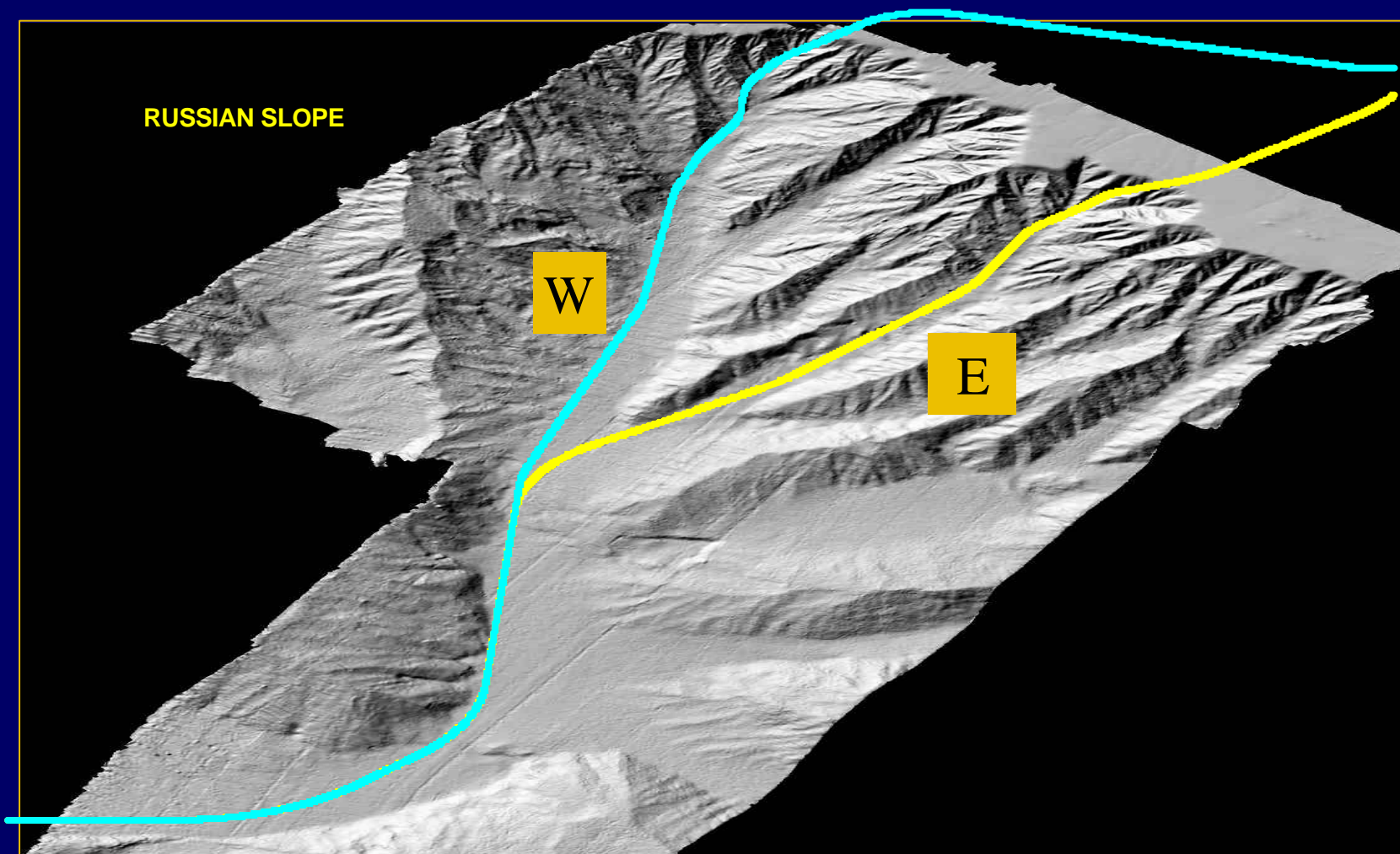
Three Layer Polypropylene (PP) Coating

- Primer Layer: Fusion Bonded Epoxy (FBE)
- Adhesive: Co-Polymer Polypropylene
- Out Layer: Polypropylene

Zinc anodes were selected since their electrochemical efficiency is independent of the H₂S content of the environment



Russian Slope - West & East Routes





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Construction cycle

Equipment Deployment



Castoro Otto



Saipem 7000



Castoro Otto





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Construction Activities

- Samsun Base;
- Onshore Works;
- Crossing the Bosphorus : A-frame lowering;
- Castoro Otto Pipe Laying;
- Saipem 7000 Pipe laying.



Subsea works

Under water activities performed :

- Surveys
- Touch-down Point Monitoring
- Sub-sea Interventions (Cable Crossing, Free spans correction)



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GROUP

Subsea works



Underwater interventions during and after laying

Beluga

- deep water pipeline trencher water depth up to 2200 m
- soil strength up to 30 Mpa



ROV

The Most Advanced, Reliable, Powerful and Flexible Deep water Work Class ROV available today

- operating in 3500 metres W.D.
- power & thrust (1000 kg)
- four pole, 1800 rpm, 200 HP Electrical Motor





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