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Subsea Cables:
Reducing Project Costs and Managing Cable focussed Operational Risk from Pre-feed through Manufacture, Installation and Commissioning

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- ***A brief biography of the Author: Antony Zymelka:***
- Antony Zymelka is a very well known cable focused professional who has amassed around 40 years of experience in the Subsea Cable industry. He has been involved in approaching 100 Subsea Cable projects worldwide.
- Antony was qualified by Pirelli (now Prysmian) in the Design of Super Tension Power Cable Accessories and the Installation, Testing, Commissioning, Fault Location and analysis of SCFF, MIND and Elastomeric (XLPE, EPR etc) Super Tension AC and DC Power Cables.
- Having spent many years Offshore on various Cable Ships, and Onshore in Design, Engineering and Project / Senior Management, his Subsea Cable Installation Operations, Installation Engineering and Offshore and Onshore Management experience is extensive. This experience encompasses Power, Telecommunication, Umbilical, Military and Scientific Cables.
- Recently, Antony has had the pleasure to accept a Directorship at BPP Cables where his expertise is being applied across many projects. BPP Cables being unique in their cables focussed technical capabilities including Dynamic Cable Design, is considered to be at the forefront of providing **INDEPENDENT** cabling solutions and technical analyses on a consultancy basis.
- Antony is considered by many of his peers as being a leading authority on many aspects of Subsea Cables. He sits on the executive committee of the European Subsea Cables Association (ESCA – formally SCUK). He also chairs the ESCA Renewables and Power Cable Sub-Group composing various industry guidelines including: Proximity, Subsea Power Cable Installation, Subsea Power Cable Repair and Subsea Power Cable Mechanical Handling and Testing.

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- What is “Operational Risk” and How can Project Costs be Reduced by Managing this Risk?
  - “Operational Risk” are those risks that are NOT specifically associated with Market, Commercial or Credit. Operational Risks are thus those risks that ARE normally associated with the “Activities” of a Particular Business or Market Sector.
  - It is Very Important to Acknowlege that Risk can **NEVER** be **ELIMINATED**. Risks exist through ALL phases of a project but by careful Management, Risk can be Contained, Reduced, Mitigated or Transferred. Note however that Transferring Risk might result in an overall Increase in Risk if not undertaken with adequate Skill and Technical Diligence.

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- Pre-FEED:
  - Broad Accuracy of Desk Top Study based research into the Overall System Requirements: Transmission Power, Transmission Voltage, Redundancy, Seabed Bathymetry and Morphology, System Length, AC / DC Options etc,...
- FEED Studies:
  - Cable Rating and Design
  - Route and Seabed Bathy / Morphology Surveys
  - Consents and Permitting
  - Route engineering
    - Threat analysis and Optimised Protection Requirements

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- System Specification and Design:
  - Over / Under Engineered
  - Optimised Solutions
- Which Commercial Model to use?
  - Cable Manufacturer Led
  - Cable Installer Led
  - Developer Led
  - Independent Consultant Technical Support
- Risks associated with Each
- Human Resources and Skills

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- Cable Manufacture and Quality Control:
  - Cable Designs, Standards and Guidelines
  - Static or Dynamic Cable?
  - The Insulation and Manufacturing Process
  - Cable Lengths and Factory Joints
  - The Manufacturing Environment
  - Independent, Skilled QC representative On Site
  - Event Logging: SLD Generation
  - Factory Storage and Transfers
  - Qualification and Acceptance Testing

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- Cable Installation:
  - Types of Vessel and their Advantages / Dis-advantages
  - Non DP, DP1, DP2 etc
  - Cable Storage Onboard
  - Climatic Effects
  - Cable Handling Equipment and Deployment Chutes
  - The Importance of Slack Control
  - Dynamometry
  - Deep Water Installation Considerations
  - Dynamic Cables for Floating Structures
  - Quality Control Monitoring, Records and Documentation
  - The Desirability for considering Jointing Onboard

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- Acceptance Testing and Commissioning:
  - Standards and Guidelines
  - Developing a Test Regime with the Cable Manufacturer
  - Warranties
  - Independent Skilled Support
  - On Site Safety and Quality Control
  - Onboard Safety and Quality Control
  - Access to Cable Ends
  - Records and Documentation

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- Strategic Spares and Repairs:
  - Lay Spares, Strategic Spares and Long Term Storage
  - Repair Vessel Options
  - Joint and Termination Suppliers
  - Generic Repair Solution Options
    - Manufacturer Led
    - (Repairer / Installer) Led
    - Independent Solutions
    - Maintenance Clubs
    - Jointing Personnel
    - Quality Control
- Warranties

Where do we go from here?

A Personal View: Is this the Future.....??

- Extra Long Cables
- Extra Deep Water Design and Installation Considerations
- Extra Large Cables and their Handling Requirements
- Extra Small Cables and their Handling Requirements
- Floating Offshore Structures and Dynamic Cables

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- Conclusions:
  - A Technical and Cost Optimised solution is the Goal
  - You are unlikely to have All of the Technically Skilled Human Resources that you need, In - House
  - Select your Consultants Carefully
  - Selecting Inadequately Skilled Consultants can be a Waste of Money and Compromise your Whole Project
  - Over Engineering will precipitate an additional Financial Burden
  - Under Engineering will have an Increased Financial Burden!
  - The Most Cost Effective and Reliable Project results from a Properly Designed, Evaluated and Inplemented Optimised Solution
  - Think towards the Future.

- THANK YOU: ANY QUESTIONS???