TITLE:- A Design for Reliability methodology for Tidal Turbine Devices.
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The presentation describes a body of work undertaken on behalf of ORE Catapult and in conjunction with DNV GL, representing Phase 1 of a 3 Phase programme to develop and validate a Design for Reliability (DfR) methodology, specifically targeted at Tidal Stream devices, develop a simulation tool using relevant parts of the Design for Reliability methodology and provide a template and definitions for a future Reliability Database.
The DfR process has a number of key objectives;

- It can be applied to a wide range of Horizontal Axis Tidal Turbine devices.
- It can be integrated alongside any Design Process.
- Elements of the process can be used effectively as stand-alone tools.
- Most processes already exist within other industries and, as a consequence, are supported with extensive literature on their application.

The DfR process leverages current "best practice" from other industries and the approach taken, divides the design and development cycle for a Tidal devices into six discreet phases which themselves contain the processes relevant to the current design/development activities, with some obvious overlaps. These phases are:

- Define
- Identify
- Analyse & Assess
- Quantify & Improve
- Validate
- Monitor & Control

All processes are underpinned with a more detailed technical report which discusses their application and, where applicable, the preferred process route, where a number of options may exist. An estimate of each process intensity (i.e. resource, time, and cost) is included to assist with scoping the tasks.

A second aspect of this work discusses two key areas to be established as enablers for the DfR methodology. These are:

- A Reliability Database – As a source of component reliability data for developers and suppliers
- A Cost Model – Required to enable accurate "lifetime" costs and cost benefits of reliability improvements to be calculated.

This project will have a significant impact – improving tidal turbine performance, reducing unscheduled maintenance activities, and increasing investor confidence. The net effect will be a reduction in the Levelised Cost of Energy.