SUMMARY

This analysis presents the results of the critical speed rotordynamic analysis of the Hydro-Air wave energy turbine rotor/bearing system for Dresser-Rand contract 139578. Results are presented to validate this rotor design.

This wave energy turbine rotor/bearing system for this unit operates well below the first lateral natural frequency. The first lateral peak response speed is calculated at ~6200 RPM which is well above the maximum continuous operating speed of 1000 RPM.

Figure 1 shows the geometric description of the turbine rotor used in the analysis of the rotor/bearing/support system. External weights and inertias that do not contribute to lateral stiffness are indicated on the figures with vertical arrows.

Figure 2 is an undamped critical speed map of the turbine. This map shows the first four rotor undamped natural frequencies over a wide range of support stiffness values.

No rotordynamic problems are expected due to the wide separation margin between the operating speed range and the first critical speed. Bearing stiffness values of 3.7 x 106 pounds/inch for the 6028-2RS1 bearing and 5.4 x 106 pounds/inch for the 6032-2RS1 bearings were calculated.

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