عنوان مقاله:

Double-Container Gas Fuel Control Valve: Numerical Analysis and Operating Conditions

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خلاصه مقاله:

Flow behavior through a gas turbine double-container fuel valve is numerically studied. Normally the gas fuel supply pressure of the gas turbine sites is over ۲۰+ barg while the combustion chamber pressure is around ۱۲ barg in base load operation and slightly more than atmospheric during start-up. Therefore, the flow control through this high range of pressure ratios is a very difficult and costly task with a single-container control valve. The double-container valve is an innovative design which consists of two parts, SRV (Stop Ratio Valve) followed by GCV (Gas Control Valve), in a compact unit. SRV maintains a significantly low pressure upstream of the GCV during gas turbine firing to establish flame and control fuel flow during acceleration. It opens the GCV to a position where it is much easier to control the flow through the valve. The same situation exists in base load operation when the turbine load is changing. The obtained results prove the special design of the valve to maintain linear characteristics of flow with stroke position in GCV. The results of the mass flow are given for various GCV stroke openings at various valve pressure ratios. Also, the range of pressure ratios for a proper operation of GCV is determined. SRV regulates the middle pressure between the two parts based on rotor speed. Therefore, a sensitive combination of globes position takes place during gas turbine operation.

کلمات کلیدی:

container, Double, Control valve, Gas turbine, Gas fuel, Numerical analysis, Operating conditions

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