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Recycle pipe location upstream of compressor inlet to avoid flow-induced vibration

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Flow induced-vibration can occur in a centrifugal compressor particularly when operating on full recycle mode and 100% of the discharge flow is re-circulated through the compressor inlet. Typically the recycle flow is introduced perpendicularly in the main inlet pipe, resulting in significant radial and circumferential flow distortion at the compressor inlet. It was analytically determined that the flow uniformity can be significantly reduced by locating the recycle pipe further upstream of the compressor inlet. The studies comprised recycle pipe locations two (2D) to five (5D) inlet pipe diameters upstream of the compressor inlet. The ratio of peak to mid-span axial velocities decreased from 24:1 to 2:1 from the 2D to the 5D cases.

Biography

Andrew Hunter has over 20 year's experience in the turbo machinery field. Currently he is responsible for the Aerodynamic Design Group at Atlas Copco, Comptec. Prior to this he was an Aerodynamic Design Engineer at General Electric Energy Large Steam Turbine Department and an Adjunct Professor of Mechanical Engineering at Rensselaer Polytechnic Institute. He received his PhD in Mechanical Engineering at RPI and MSc in Mechanical Engineering from Union College. His areas of expertise include aero/thermodynamics of axial and radial turbo machinery. He is the author of 8 publications and one US patent; he is a senior member of the ASME and AIAA. He is a co-organizer of the 2014 IGTI COMM 22: Heat Transfer in Steam turbines (with steam).

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