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### The History of Low IGV Settings on the 7FA

It was the mid to late 1990's that typical 7FA IGV settings were at 88 degrees, but it's now common to see settings anywhere from 78 to 84 degrees. The IGV modulates the airflow into the compressor resulting in more or less generation.

The change occurred during the late 1990's when miscalculations in the main quoting tool (the cycle deck) developed by the OEM occurred. The quoting tool predicted better performance than achievable. It was also a time of astronomical gas turbine sales created from the Enron high spot market power price issue. Soon the OEM realized they were exposed to millions of dollars of potential liquidated damages from coming in short of guarantee performance. The first mitigation was to overfire the unit, however, that is a risky strategy for the long term due to potential parts failures.

The best example of this is a unit with an unflared compressor that has IGV's set at 90 IGV, which would most likely be a mitigated unit with also a high firing temperature. Due to the fact that overfiring a unit is risky, the OEM opted to increase the mass flow of the compressor by opening the inlet area up. This was called the flared or snowflake compressor. With that introduction there was enough mitigation margin on many units to now reduce the IGV's to reduce generation and still make guarantee.

Without reducing IGV's, in the OEM's eyes, were leaving MW's on the table when guarantees were made at the rated firing temperature. Guarantees continue to be made with a cycle deck model that is configured with an unflared compressor. Then the units are delivered and commissioned with a flared compressor resulting in extra margin to the guarantee. With the IGV reduction accompanies a firing derating. Out of this combination came the marketing bonanza, where the OEM uprates your unit back to the setting it should have been set to in the first place.

Manipulating those controls has made it possible for the OEM to sell programs that corrects these low IGV settings, but at a high cost to you. GTAnalysis has come up with the **GTopt**, our Performance Optimization Program, that will improve performance, but at a much lower cost to you. GTopt will fix control settings that were left during commissioning, such as, the partially closed IGV's, underfired control curves, underrated unit operation, and unmatched part load control curves. GTopt will optimize generation by increasing around 5-8 MW and decrease heat rate 40-60 Btu/Kw-Hr. Turndown will also be improved resulting in reduced parts life impact and reduced start costs.

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