

Review, Modelling and Improvement of Transco Dispatch

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Abu Dhabi Intro to Scheduling and Dispatch

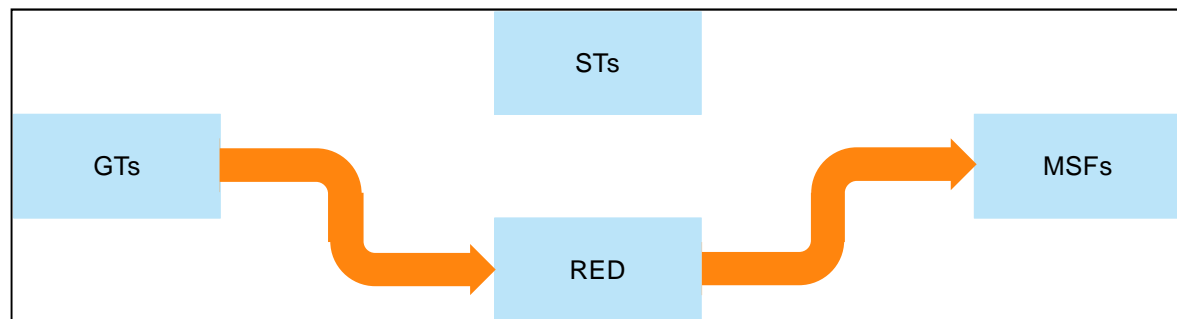
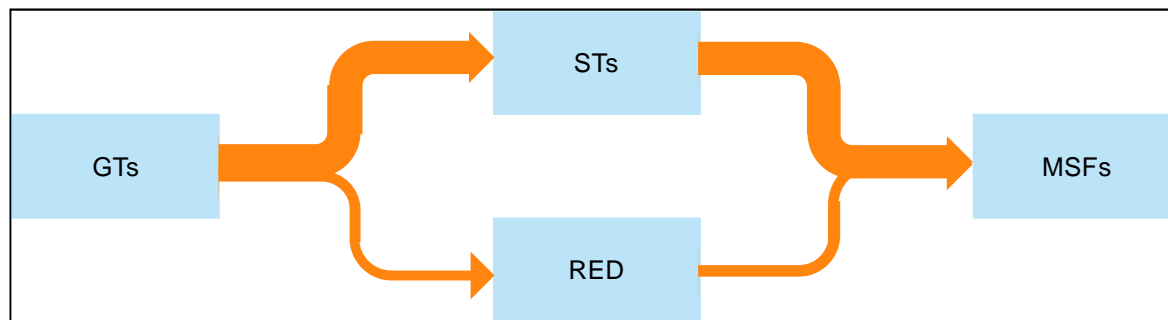
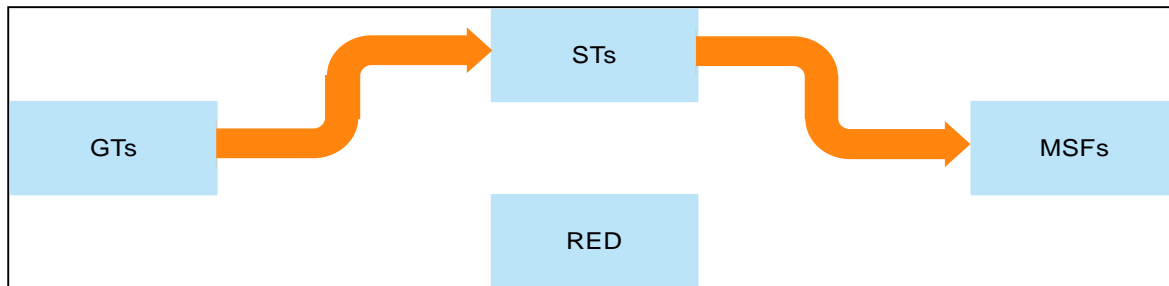
- The Abu Dhabi Water and Electricity Authority network comprises of **12 Independent Water and Power Plants**, commercially contracted through Power & Water Purchase agreements
- **100 generating units and equal numbers of distillers** are committed and dispatched every day in an optimized manner through a state-of-the-art software called **“unit commitment” (UC)**
- **UC schedule** is then implemented in **real time** whilst keeping **demand and supply in balance**
- Various changes in **power station availability** and **demand** on the day means that the real time dispatch will vary from the previous days UC



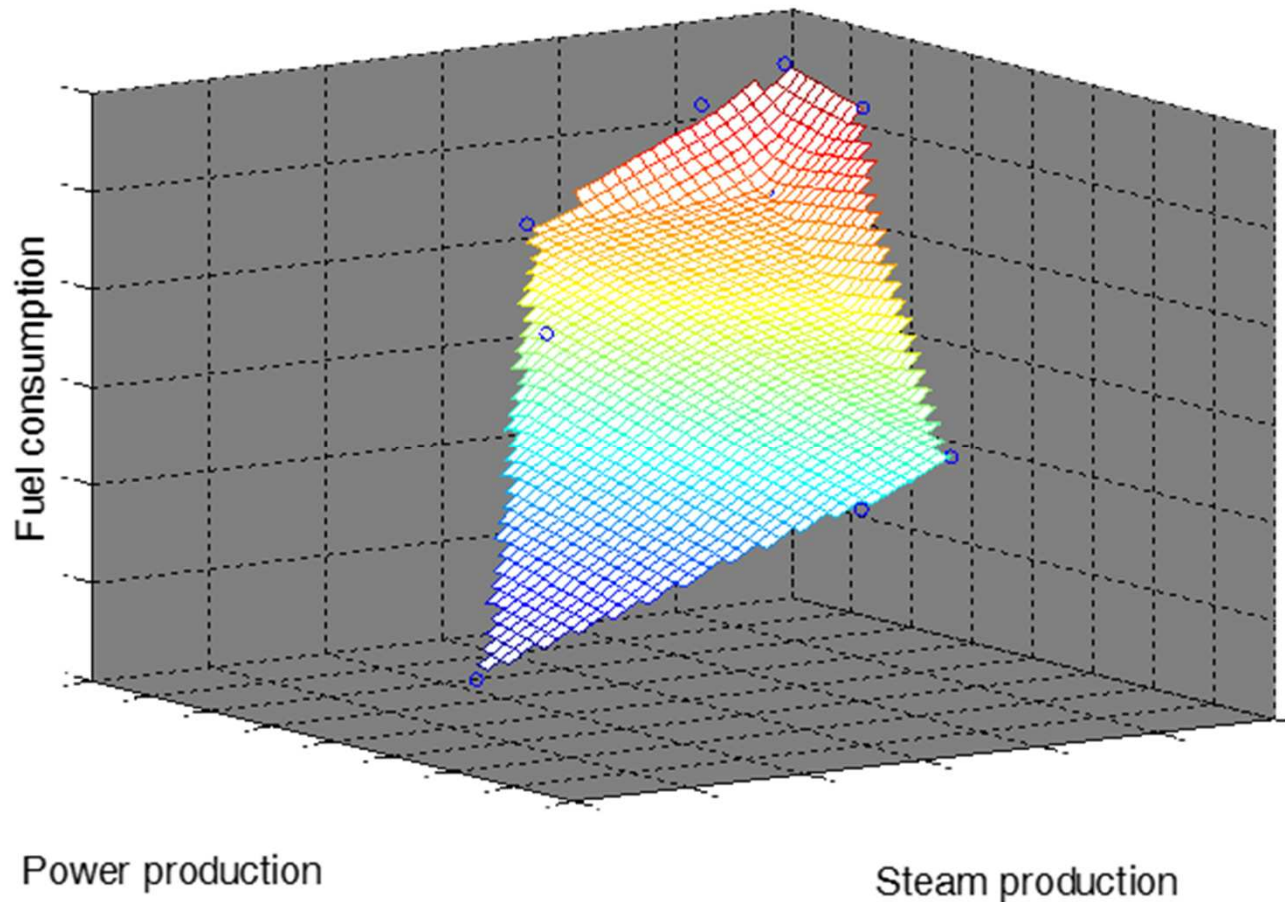
Power and Water Plants

- standard combined cycle units can operate in two basic modes
 - only the gas turbine is operating (open cycle mode) with efficiency around 45%, and
 - when the waste heat is put through a boiler and provides steam to a turbine (closed cycle mode) with efficiency around 60%
- Combined cycle units with distillers have positive steam turbine outlet pressure and steam flow has to be sufficient to produce the required water production.
- Steam reduction valves to bypass steam turbine to maintain low pressure steam production for the distillers are also deployed.

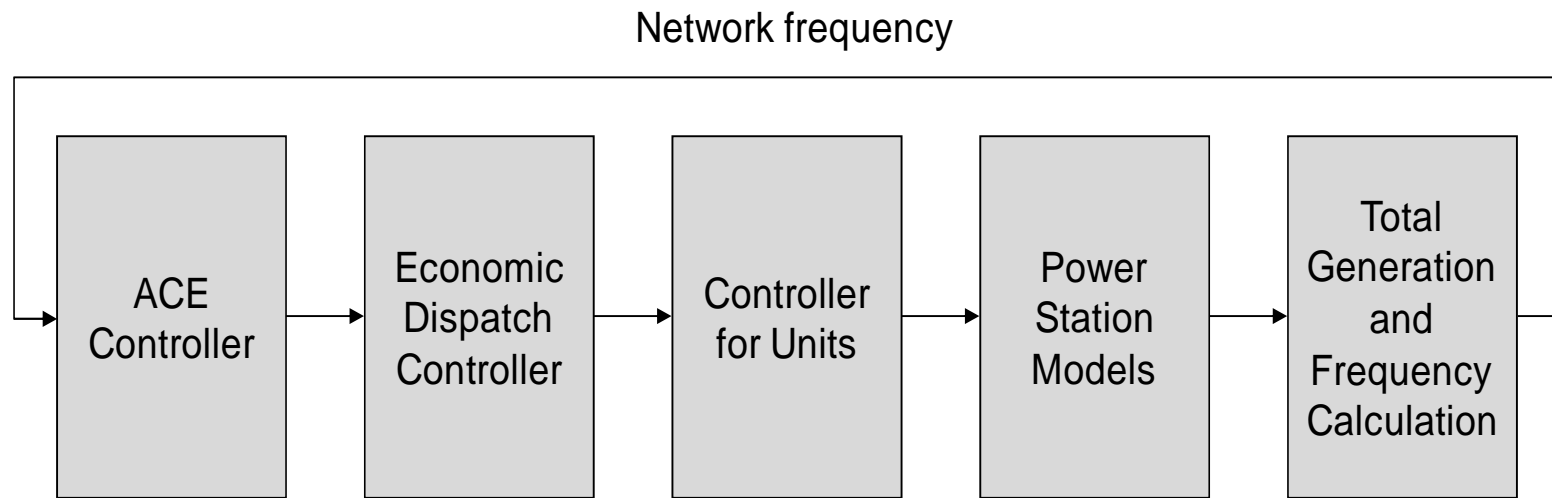
Modes of operation



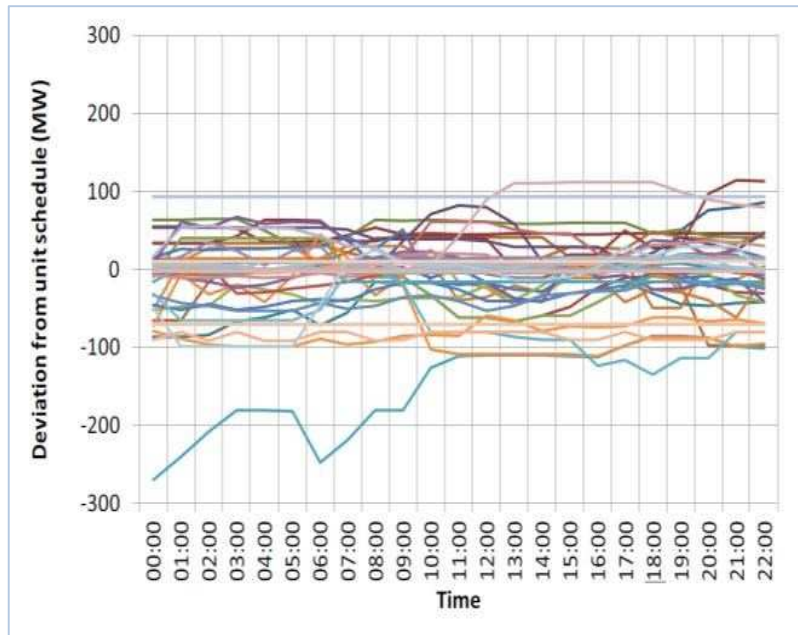
Fuel consumption surface Power and Steam



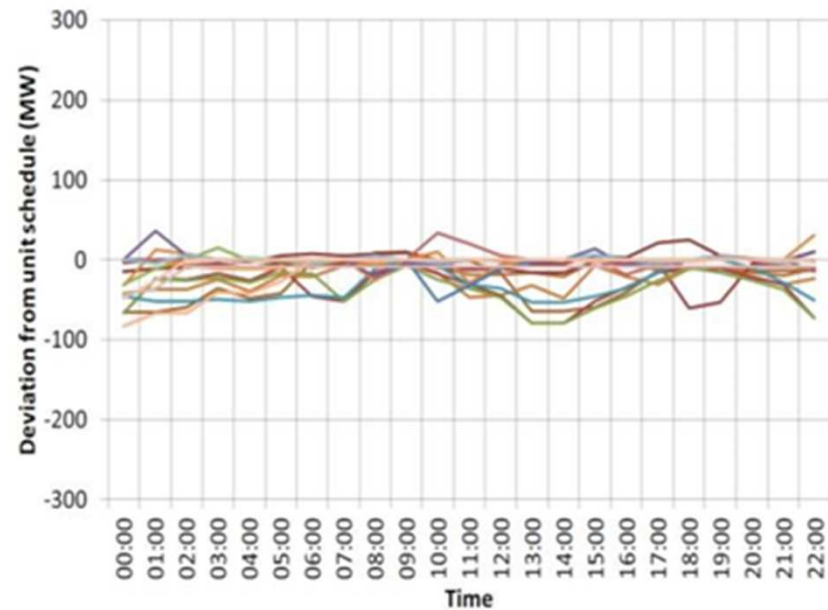
Generation Scheduling and Dispatch Tool



Results of the Modelling in GDAT

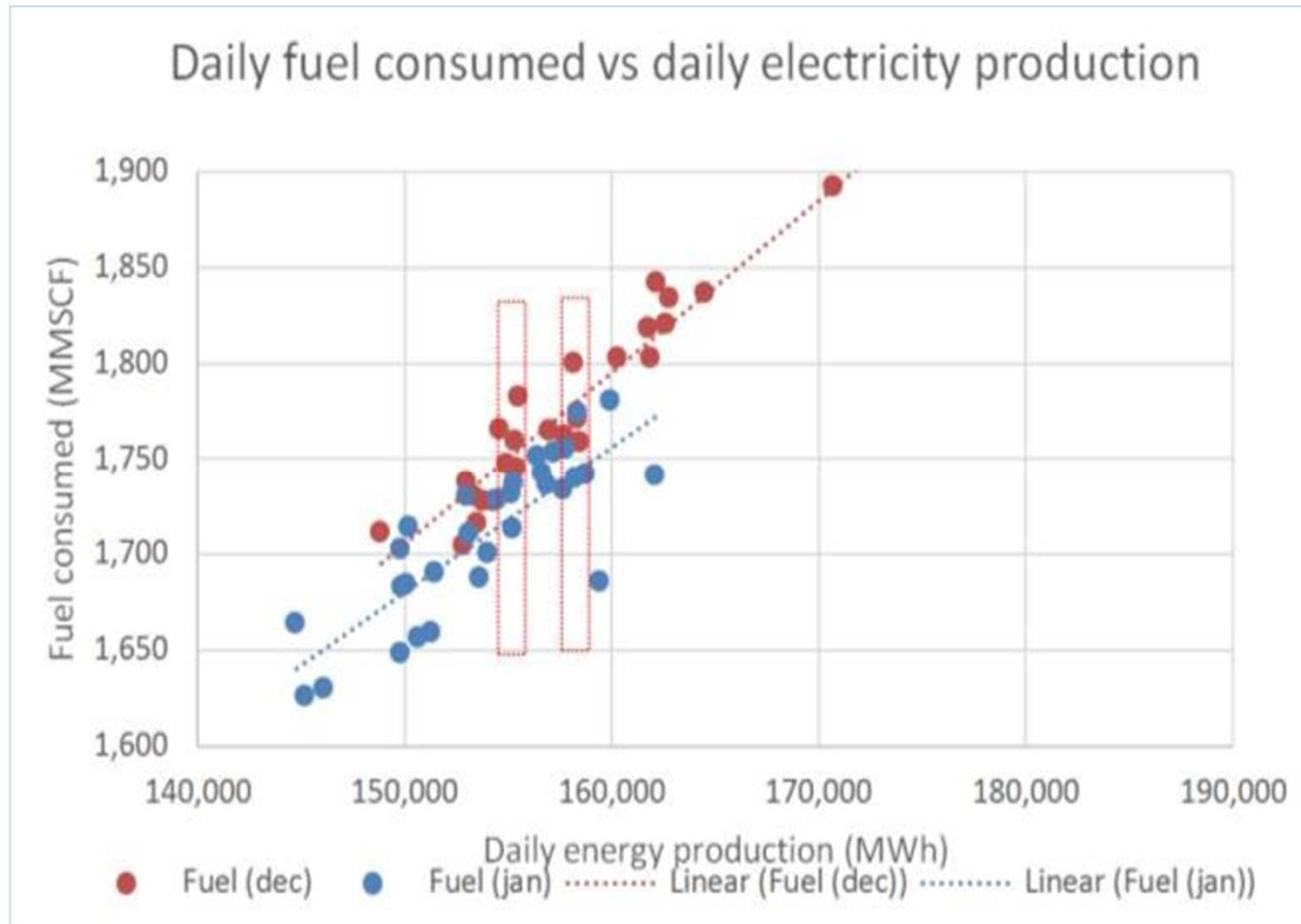


Original deviation of units from UC schedule



Simulated deviation from UC schedule after unit by unit dispatching

Implementation of Unit by Unit dispatch results



Conclusion

- The review of TRANSCO scheduling and dispatch identified areas for significant fuel savings, TRANSCO has been implementing the recommendations and the overall fuel savings thus far is estimated to be **3-4 %**.
- The GDAT tool was instrumental in identifying fuel savings in improving unit by unit dispatch which resulted in a conservative **1.5-2% fuel savings**.
- The GDAT tool provided to TRANSCO has also been used for:
 - tuning of AGC
 - optimising secondary frequency control and reserves.
 - secondary reserve sharing arrangement between TRANSCO and OMAN.
- The GDAT tool can be used to determine the techno economic impact of renewable energy projects and upcoming nuclear power.