

GE
Energy

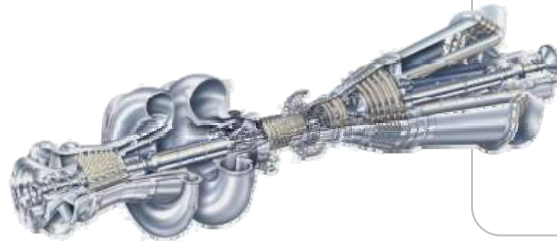
Session III – New Power Engineers; Prognosis and Needs

May 7-8, 2008

UWIG/NREL Industry-University Workshop
On

*Power Engineering Needs for the
Wind Industry*
Broomfield, CO

Hamid Elahi



New Paradigm: Renewables First!

- Conventional IRP: Capacity *first* and Energy *next*.... Inverted!!

Implications:

➤ Reserves

Old: use LOLP to calculate reserve margins.....Inadequate

New: use LOLP with Renewables to calculate right *type* and amount of reserves

➤ Transmission

Old: Deterministic limits of grid capabilityNot applicable

New: Probabilistic model of grid capabilities and limits

“Myth” vs “Reality”
Confusion leads to missed opportunities!

What does the industry need?

- Fundamentals of:
 - Power system integrated resource planning...with intermittent resources
 - Power system operation
 - Power system dynamics and transients
 - Power markets...ancillary services
 - Energy policy and regulatory response
 - Problem solving using stochastic methods
 - Alternative energy technologies

Exciting times to attract bright and innovative minds!

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Thank you!



imagination at work

