

National Grid

System Performance

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National Grid

Challenges Under NETA

- ◆ Matching supply and demand
- ◆ Frequency control
- ◆ Resolving transmission constraints



Effect on System Performance

Since 27th April:

- ◆ System Margin has been adequate
- ◆ No NGC System Warnings issued
- ◆ No emergency actions required



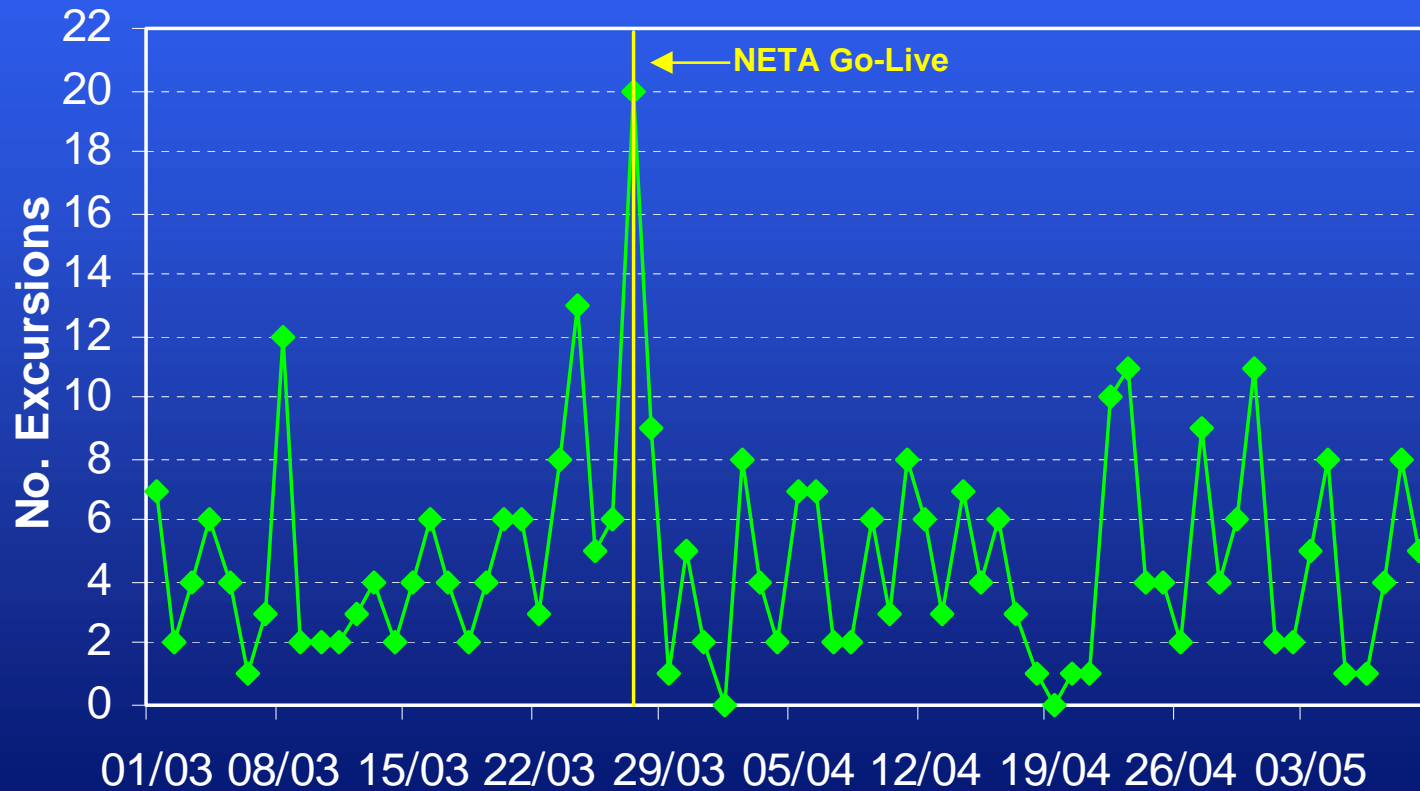
Frequency

- ◆ Primary measure of system performance
- ◆ Indicator of generation/demand balance
- ◆ Since 27th April:
 - No excursions outside statutory limits ($\pm 0.5\text{Hz}$)
 - Excursions outside operational limits ($\pm 0.2\text{Hz}$)
little changed



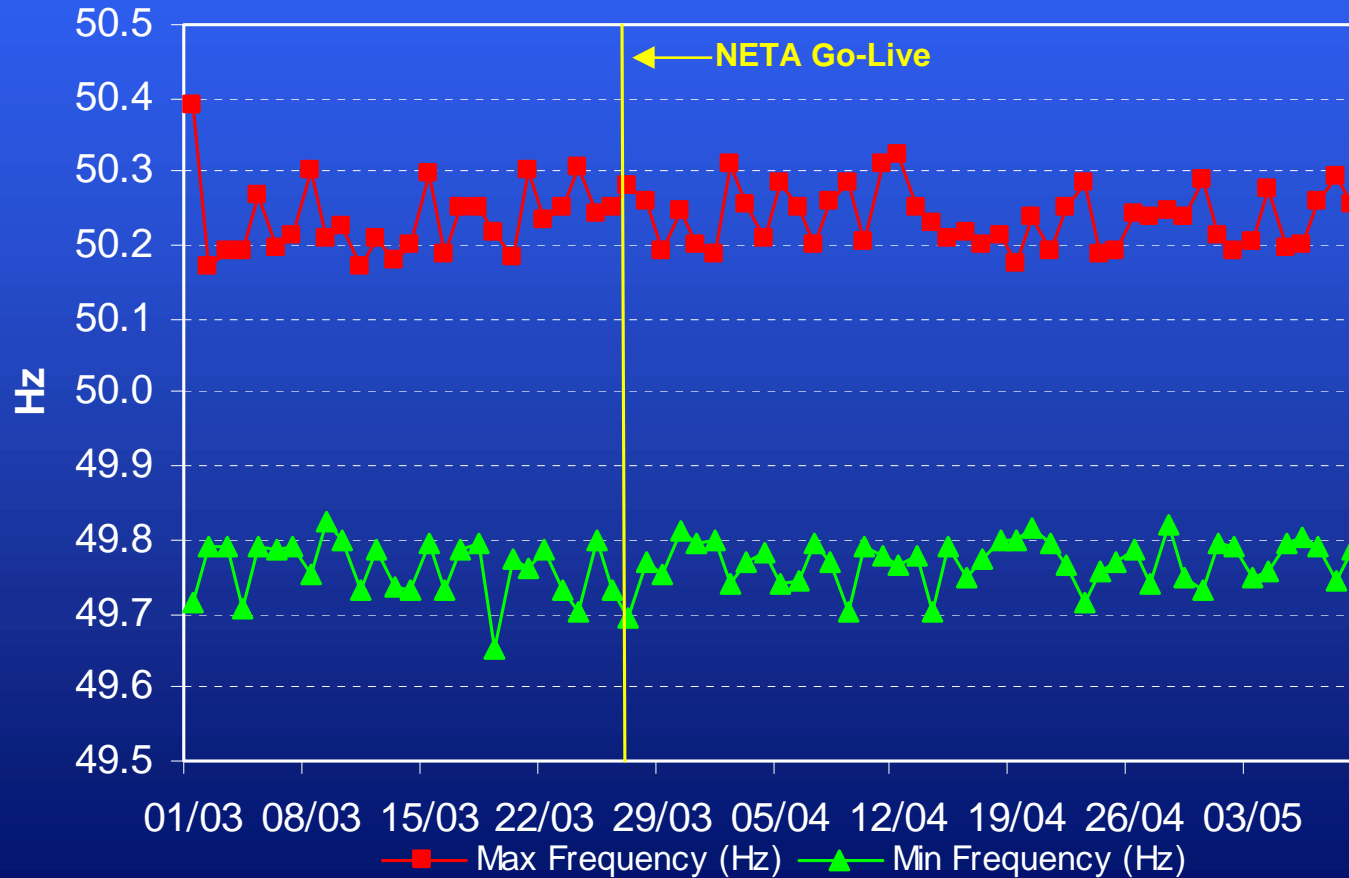
Frequency Performance

Excursions Outside Operational Limits ($\pm 0.2\text{Hz}$)

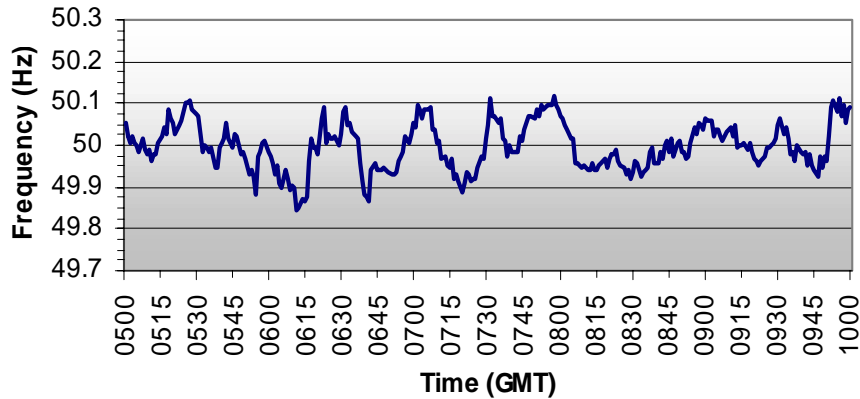


Frequency Performance

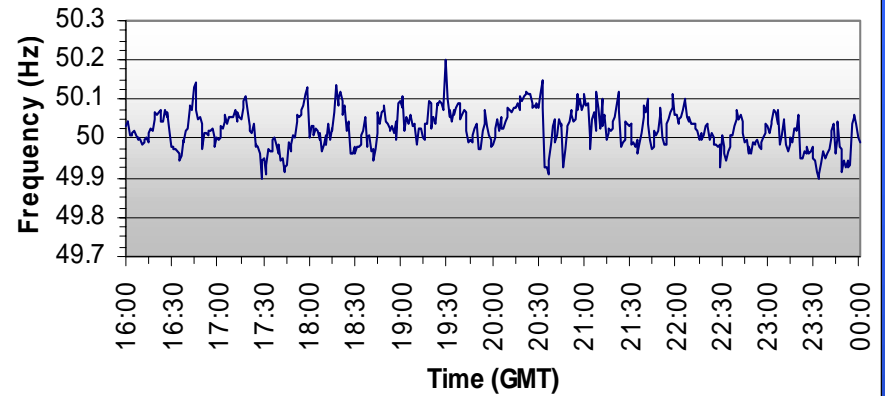
Daily Frequency Extremes



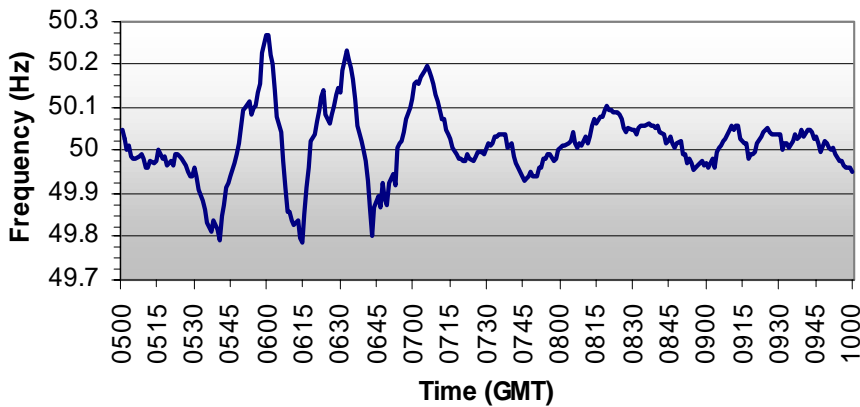
**Frequency During Morning Pick-Up
on 28 March 2000 (pre-NETA)**



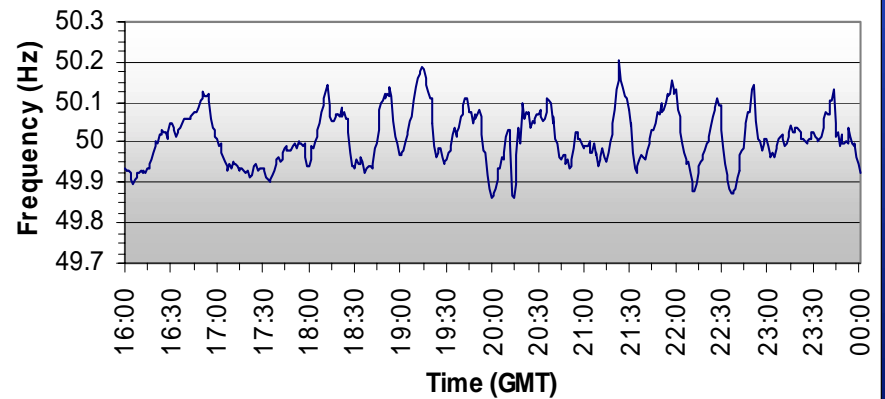
**Frequency During Evening Period
on May Day Bank Holiday 2000 (Pre-NETA)**



**Frequency During Morning Pick-Up
on 28 March 2001 (NETA)**



**Frequency During Evening Period
on May Day Bank Holiday 2001 (NETA)**



Frequency Volatility

- ◆ Amount of generation ramping at any one time is significantly more than before
- ◆ Accuracy of PN following



Frequency Control

- ◆ Why does NGC have operational limits?
 - Ensure frequency returns between statutory limits within 1 minute of a transient excursion
 - Proven UK industry standard for many years
 - Consistent with good international practice
 - Automatic demand shedding starts at 48.8Hz
 - Erosion of response at lower frequencies
 - Effects on electrical machines



Frequency Control



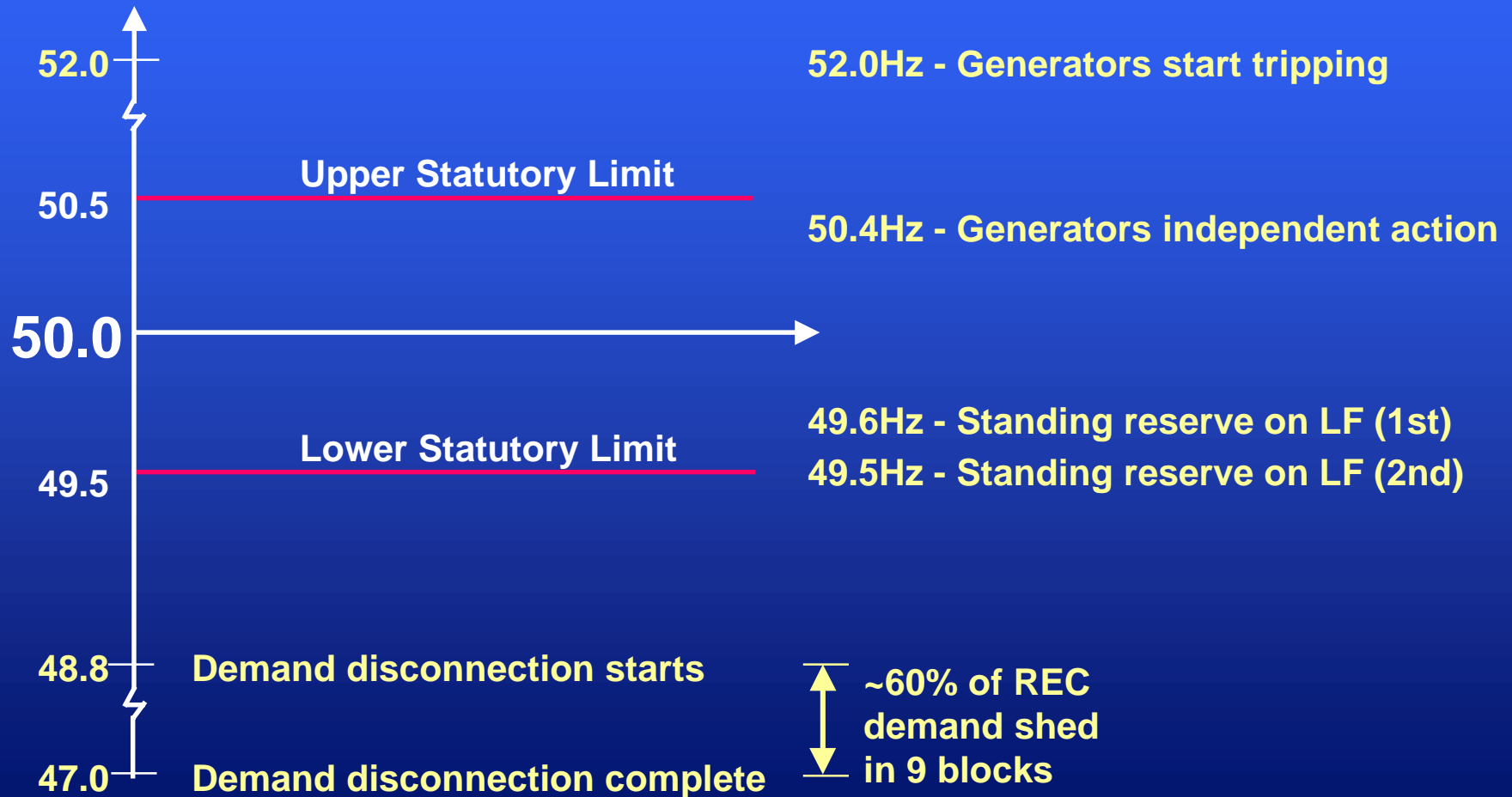
Statutory limits of 50Hz \pm 1%

Allowed outside limits under exceptional circumstances but must recover within 1 minute

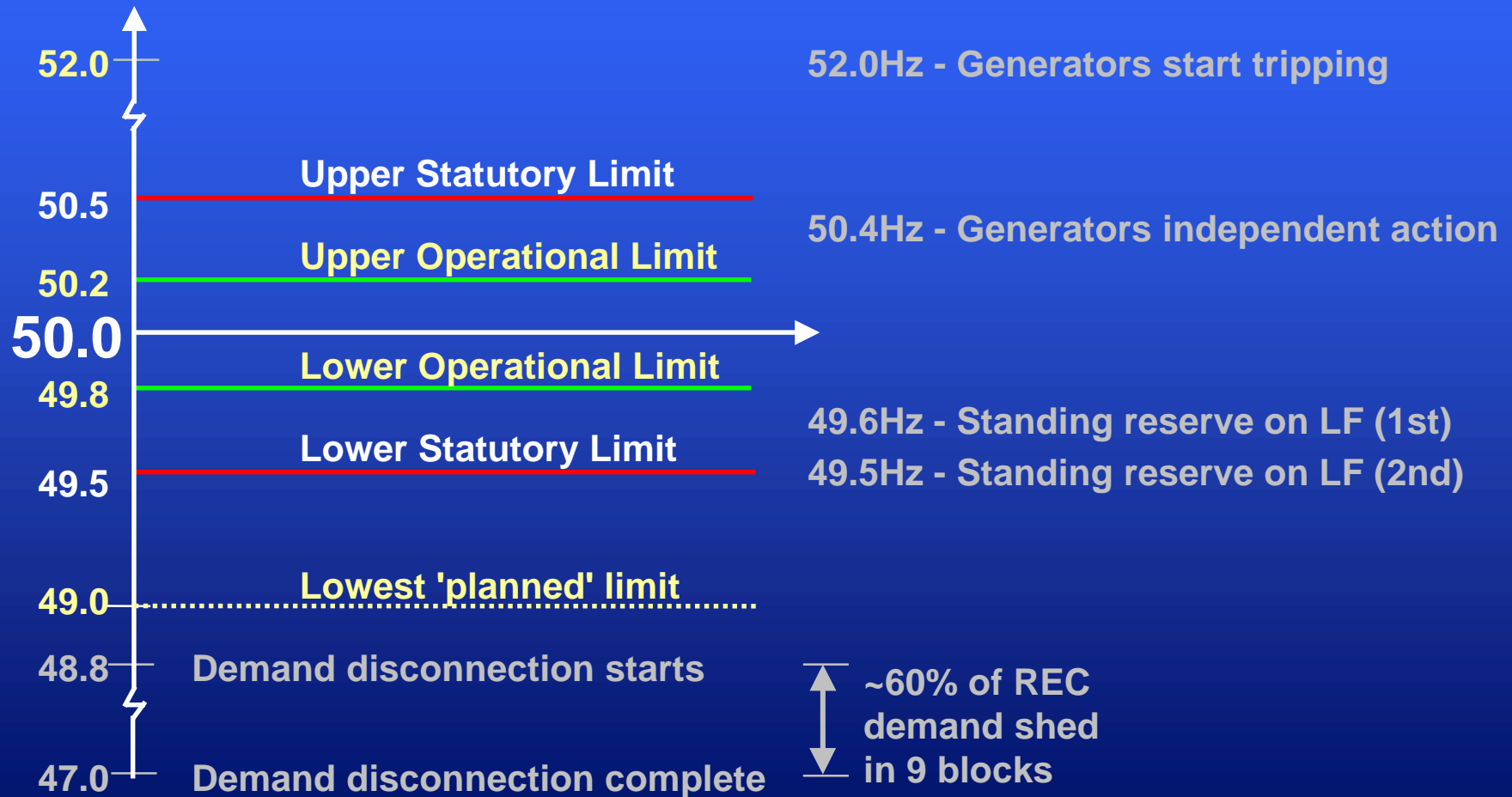


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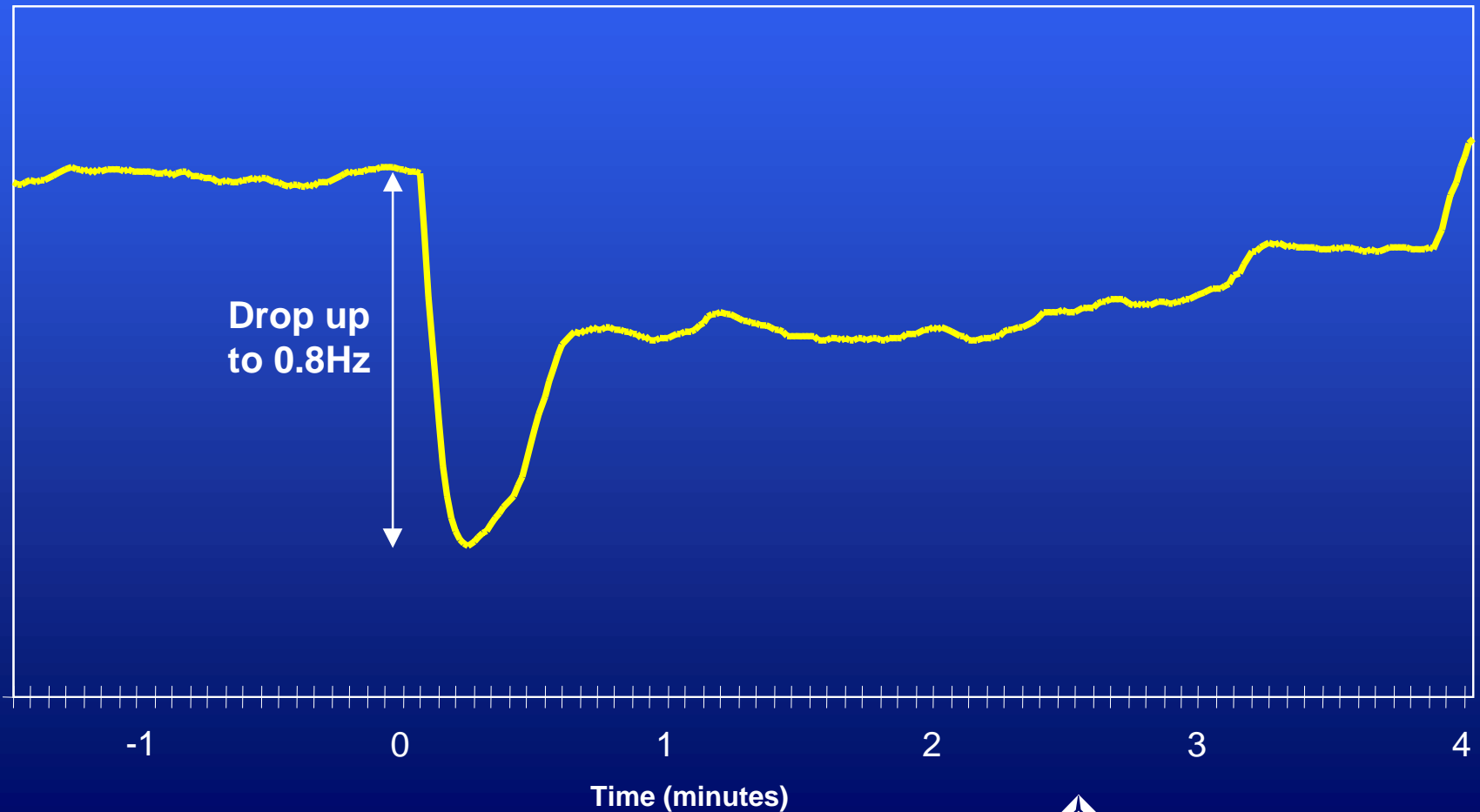
Frequency Control



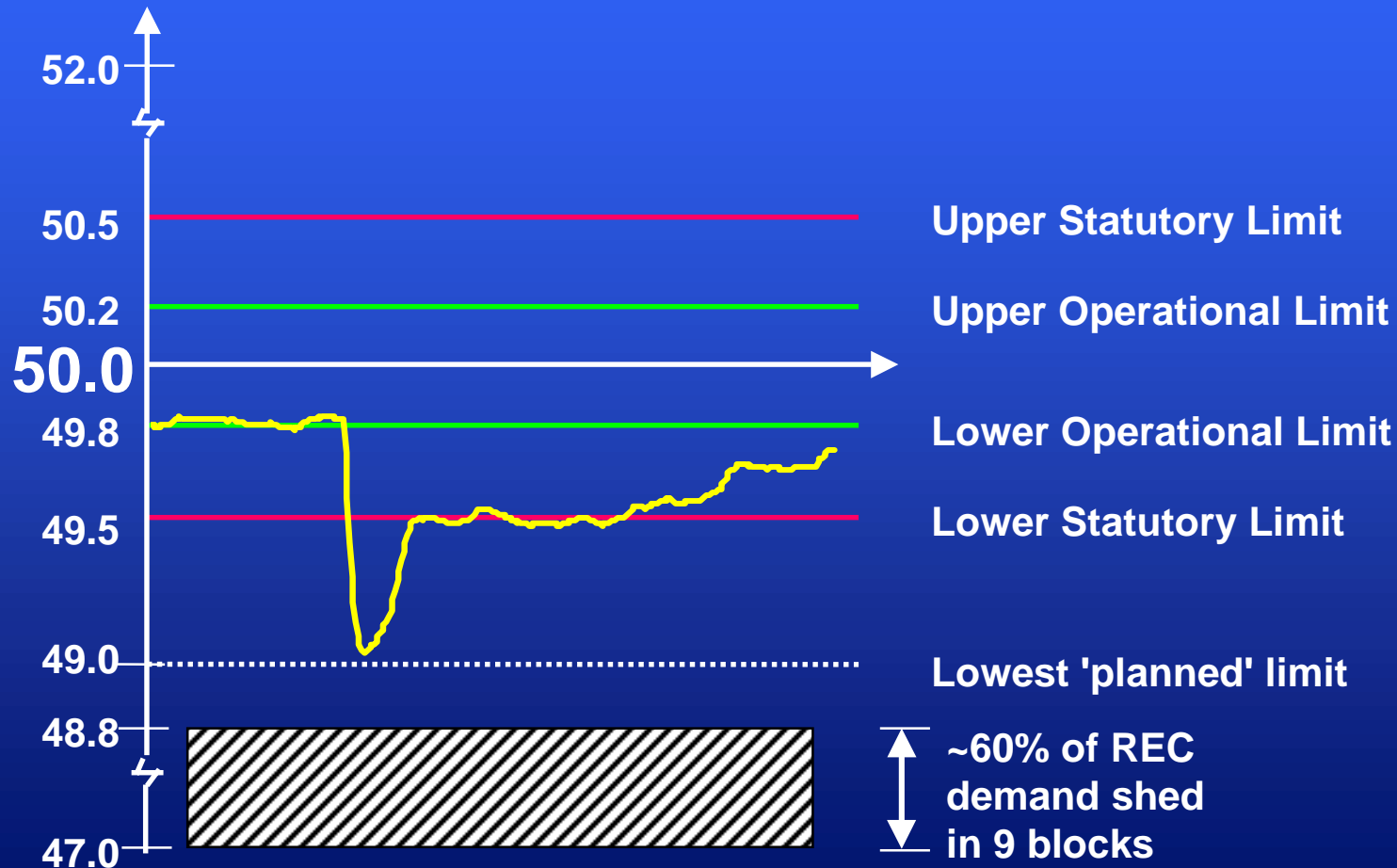
Frequency Control



Typical Frequency Trace For Loss > 1000 MW



Large Generator Loss - 49.8Hz



Summary

- ◆ Frequency controlled but more volatile
- ◆ Safe and secure operation assisted by Grid Code compliance



NGC NETA Help Line

◆ Tel: 0118 936 3720

◆ email: ngc.helpline@uk.ngrid.com

◆ Next forum: Mid - June TBA



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