

Demand Side Developments

Operational Forum

5th March 2003

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Agenda

- ◆ Demand Side participation
- ◆ Frequency Control by Demand Management (FCDM)
- ◆ Fast Reserve
- ◆ Standing Reserve



...no longer the bridesmaid

<i>Service</i>	<i>MW</i>	<i>Sites</i>	<i>Companies</i>	<i>Growth since NETA go-live</i>
<i>Response</i>	<i>440</i>	<i>25</i>	<i>11</i>	<i>0 MW</i>
<i>Standing Reserve</i>	<i>422</i>	<i>22</i>	<i>16</i>	<i>160 MW</i>
<i>Fast Reserve</i>	<i>620</i>	<i>various GSP sites</i>	<i>4</i>	<i>620 MW</i>
<i>Demand Profiling</i>	<i>600</i>	<i>various GSP sites</i>	<i>1</i>	<i>600 MW</i>
<i>Demand Intertrip</i>	<i>200</i>	<i>2</i>	<i>2</i>	<i>0 MW</i>

As at 5th March 2003



National Grid

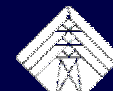
FCDM

*Frequency Response by Demand
Management*

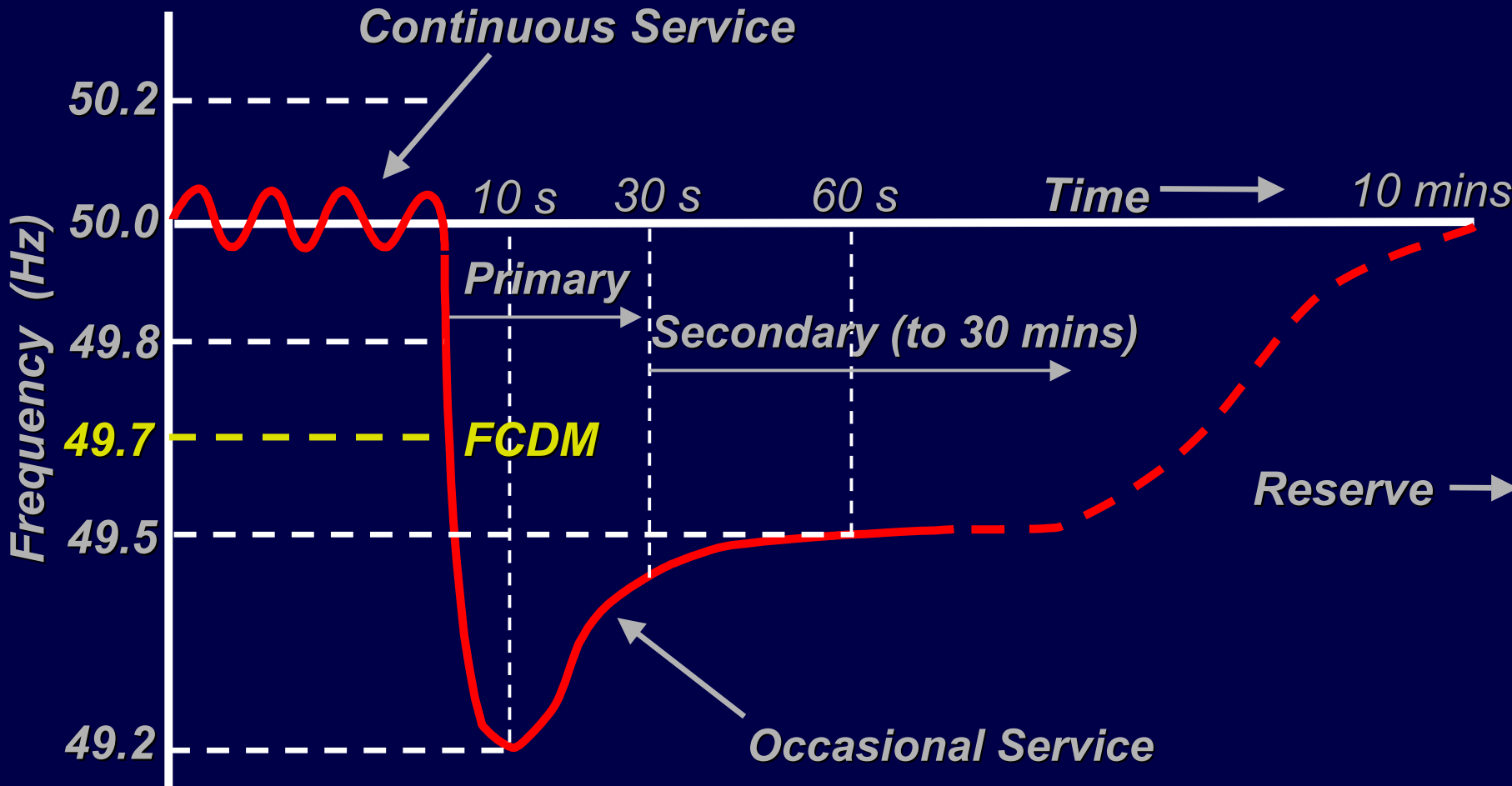


FCDM: What is it?

- ◆ A commercial frequency response service
- ◆ Provided typically by Steelworks, Cement Works, gas manufacturers, etc
- ◆ 'Static' rather than 'dynamic'
- ◆ Automatic disconnection of agreed loads via low frequency relay set to 49.7 Hz
- ◆ Delivered in primary response timescales
- ◆ Sustainable for secondary response timescales
- ◆ 'Firm' and 'Probabilistic' options



FCDM - Where it fits in

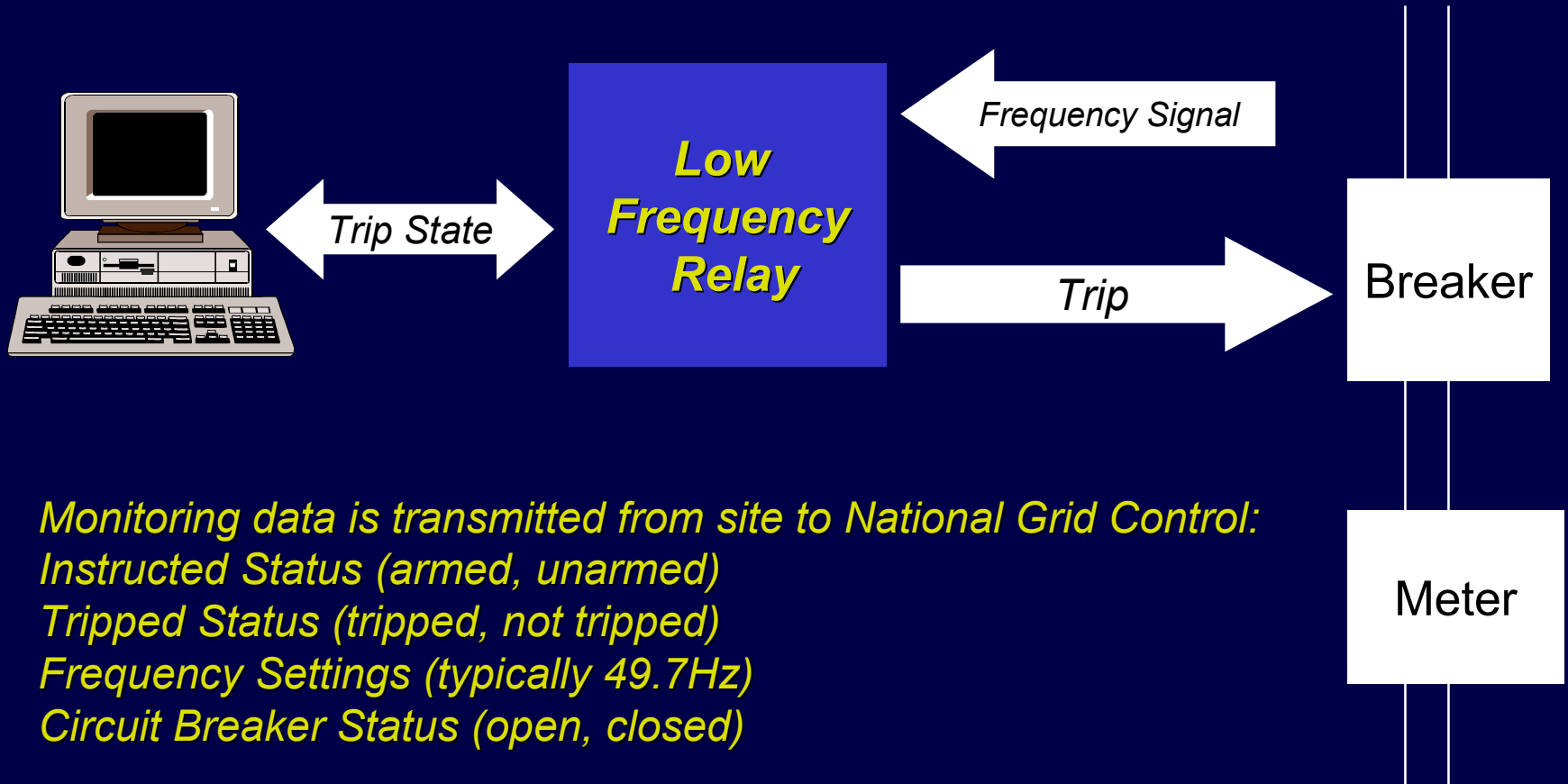


Procurement

- ◆ **Via sole Agent who aggregates loads into single offered volume**
- ◆ **Accepted availability paid on metered load**
- ◆ **Single price (£/MW/hr)**
- ◆ **Single contract direct with Agent**
- ◆ **Agent has back to back agreements with providers**
- ◆ **Volume offered steadily grown**
- ◆ **Total current volume ~440 MW (~29% of total response held)**



FCDM Hardware



*Monitoring data is transmitted from site to National Grid Control:
Instructed Status (armed, unarmed)
Tripped Status (tripped, not tripped)
Frequency Settings (typically 49.7Hz)
Circuit Breaker Status (open, closed)*



FCDM Issues

4 main considerations

Sole agent route to market

limits entry

Static response a finite requirement

Approaching “over supply”

Single price

Despatch sub-optimal if scheme “saturates”

Service specification & events of default

Requires clarification & simplification



FCDM Going Forward...

Remove sole agent limitation

new software available this month will permit additional agent(s) and direct access

Phased approach to competition, subject to:-

balance of “oversupply” of finite static requirement and single price
sufficient new volume to provide liquidity & hence competition

Revisions to contract form

Simplification of service specification

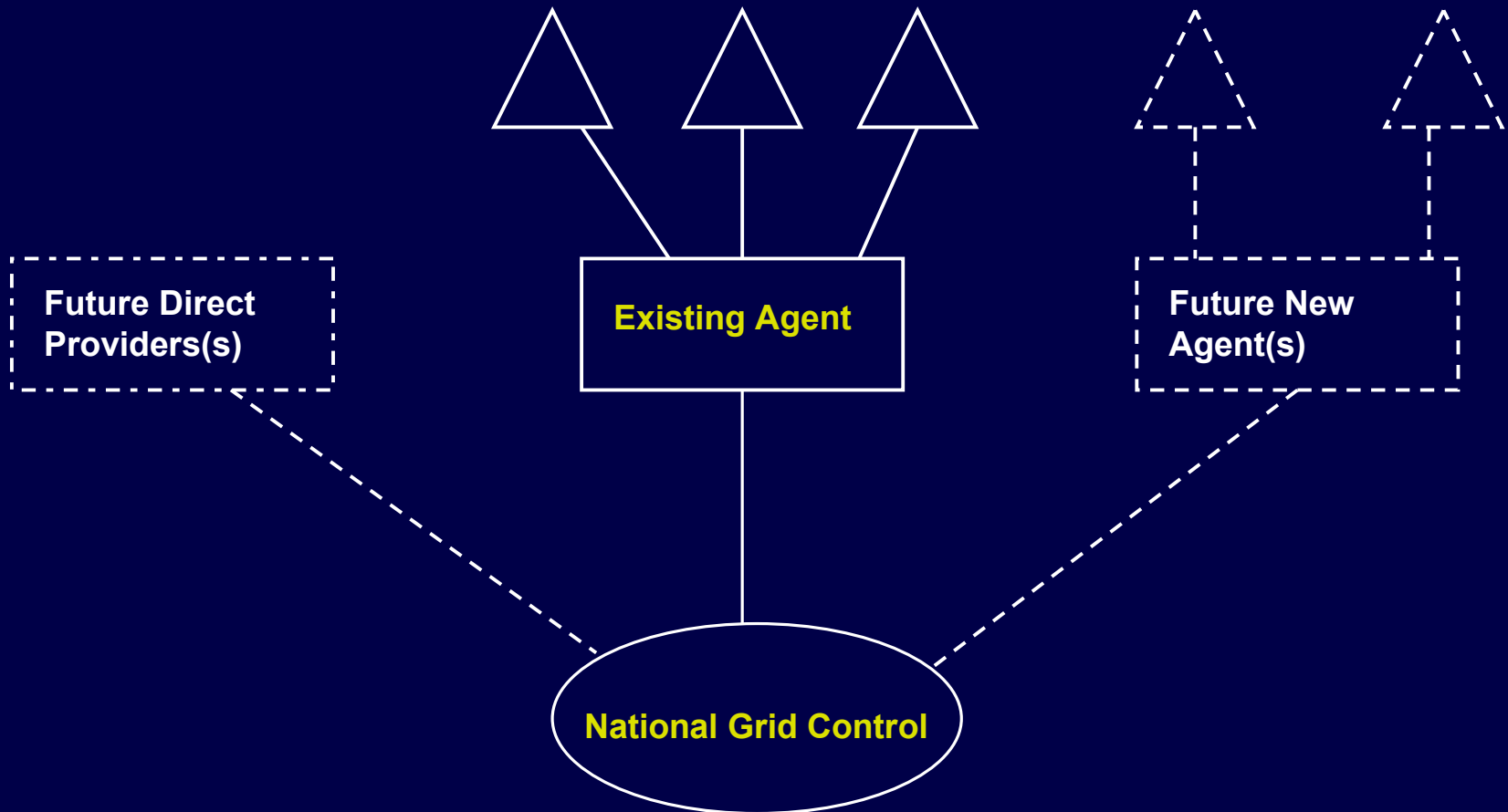
Clarification of events of default



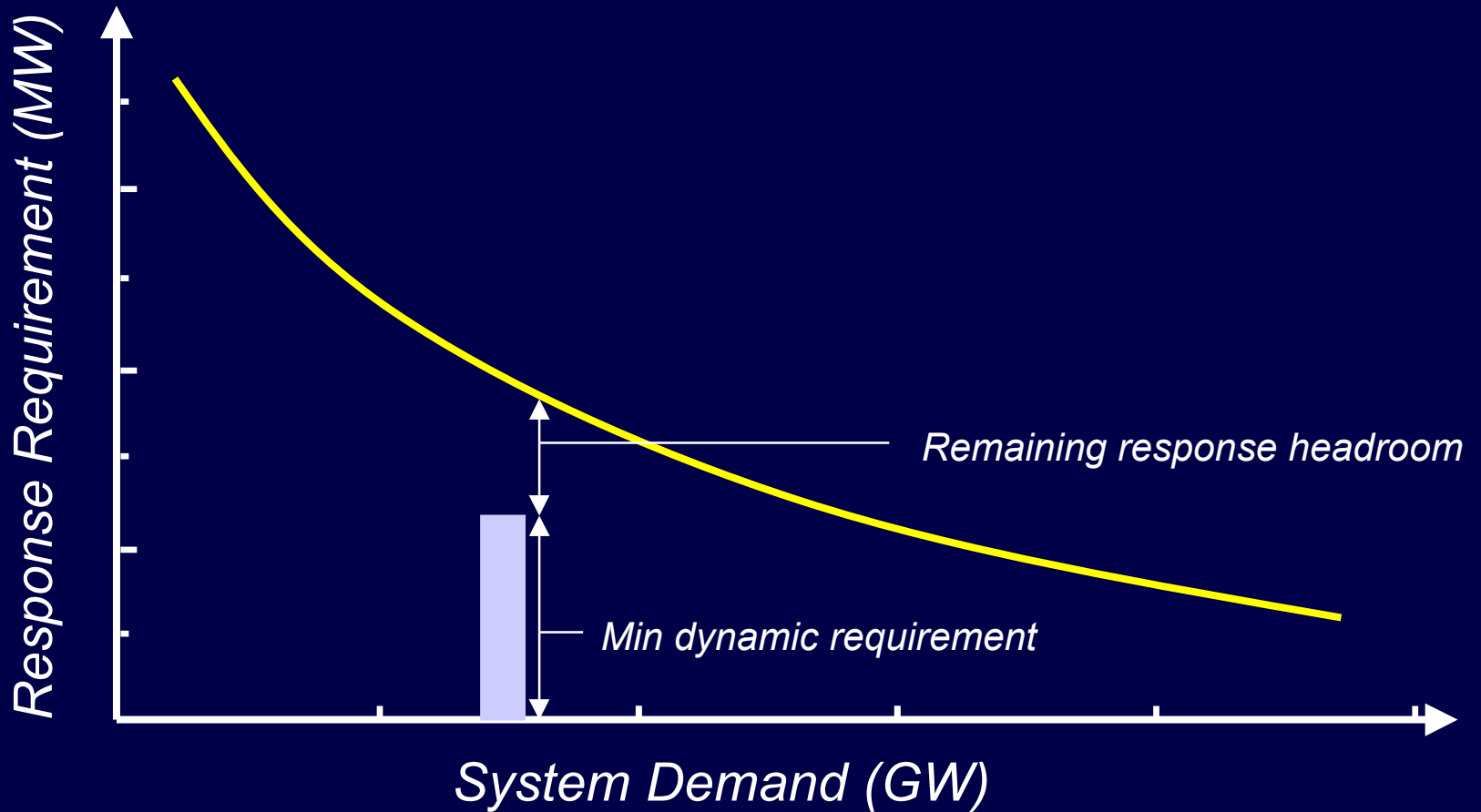
Schematic of FCDM interface

Sub-Contracted Providers to Agent

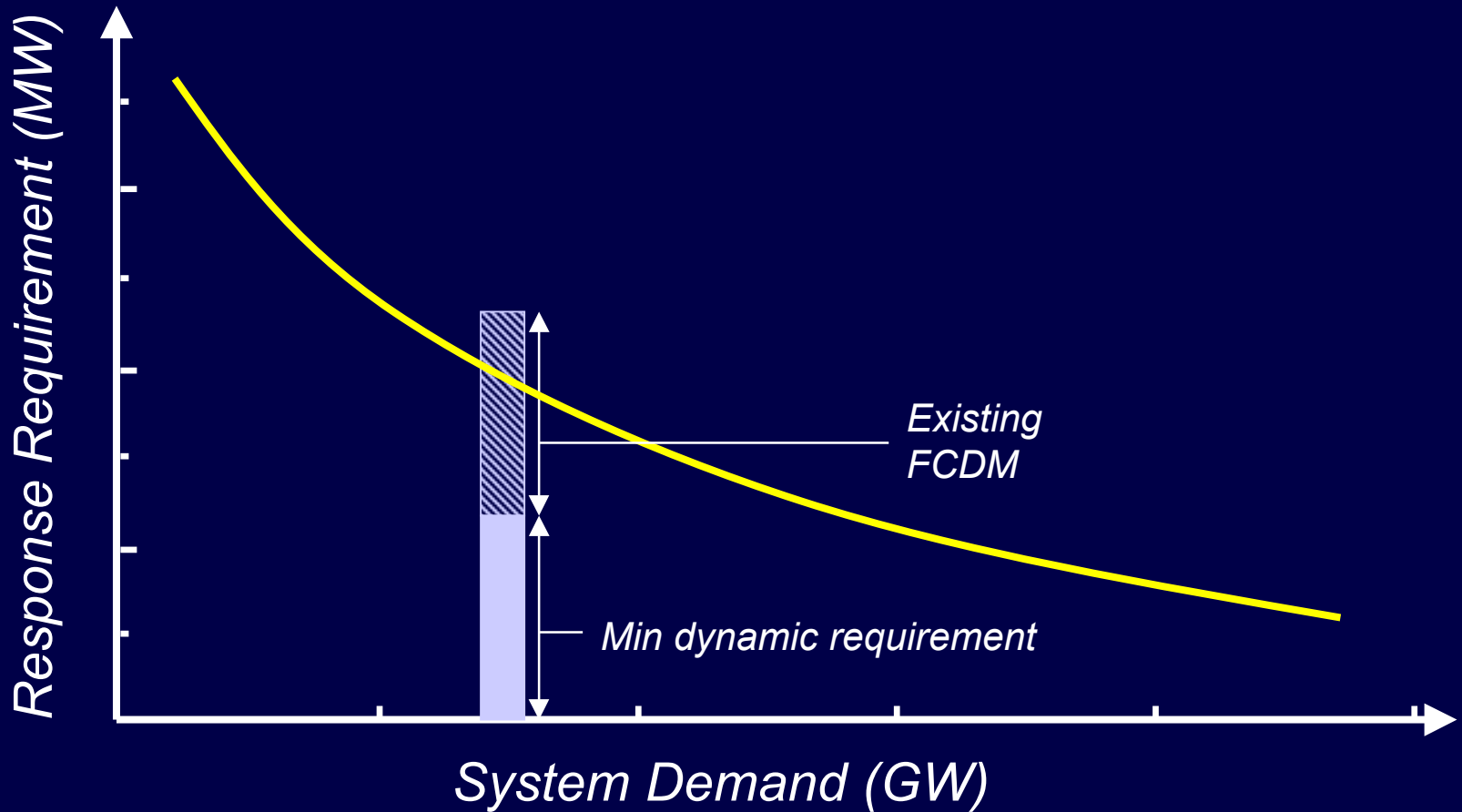
New Providers to Agent



Response requirement



FCDM as part of requirement



FCDM Summary

Now

- ◆ Multiple agent/direct service capability

Future

- ◆ Price Change facility

Benefits

Multiple agents will enable choice

‘price ladder’ will enable differentiation of volume

price change will provide competition



Fast Reserve

Demand-side opportunities



Demand-Side Fast Reserve

- ◆ Large customers (proven)
 - ◆ process control by direct circuit breaker operation
- ◆ Small customers (under trial)
 - ◆ water/space heating control by Radio Teleswitch (RTS)/CycloControl
- ◆ Provision ultimately via monthly tender



Radio Teleswitch

Key features

- ◆ Near-instantaneous delivery
- ◆ Geographically dispersed
- ◆ Programmable commands
- ◆ Instant commands

Potential Services

‘Fast Reserve’ type services

Off-peak demand profiling (programme amendments)

Off-peak fast reserve (short term interruptions)



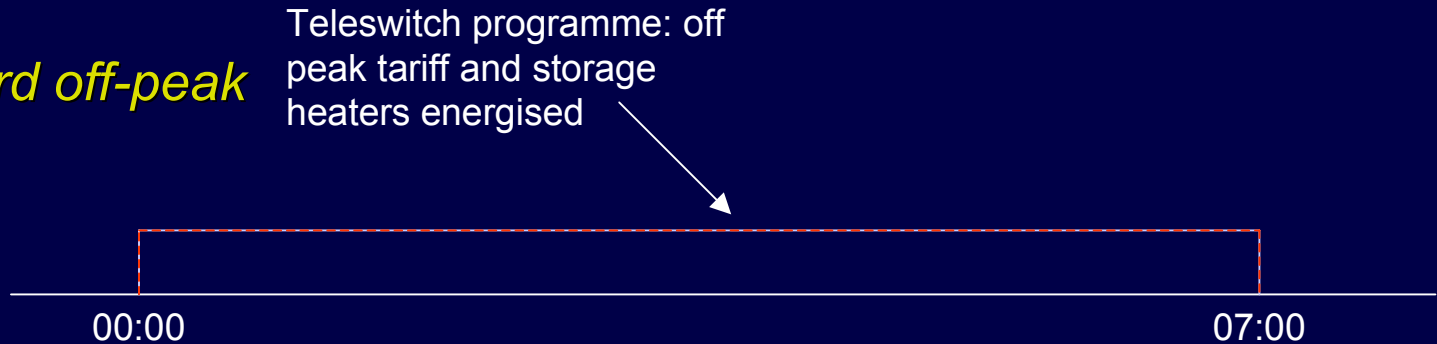
RTS: Off-peak Demand Profiling

- ◆ off-peak switching 'staggered' to smooth rapid demand changes
- ◆ achieved by programme changes
- ◆ improves despatch efficiency
- ◆ 'off-peak tariff' specific
- ◆ Heating Load based - most effective in winter

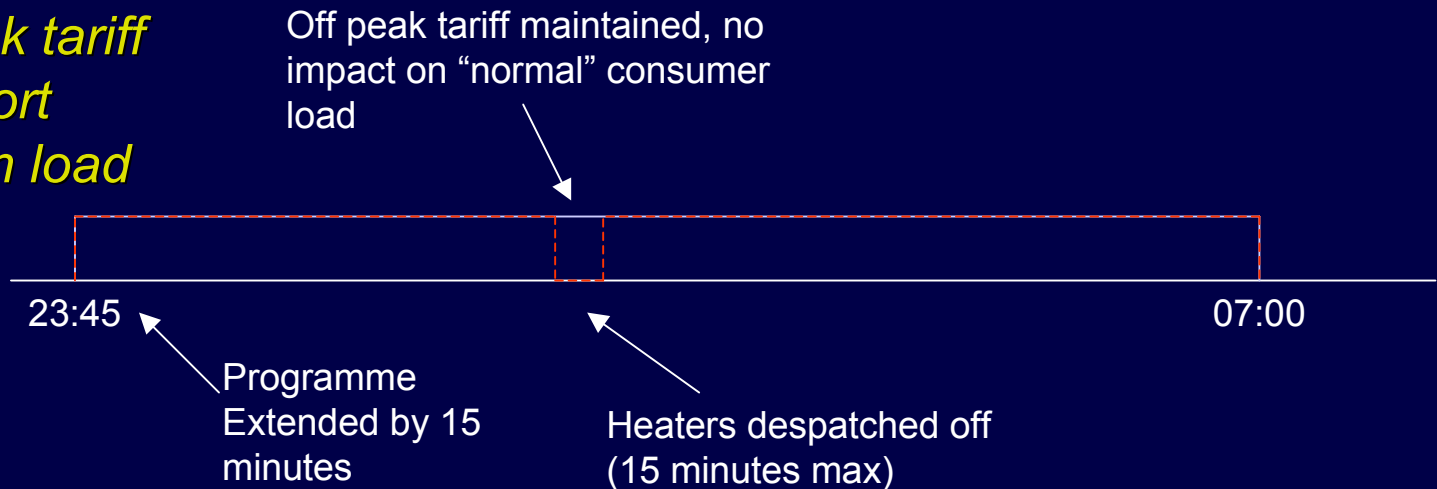


RTS: Short Duration Load Shed

Standard off-peak tariff



Off-peak tariff with short duration load shed



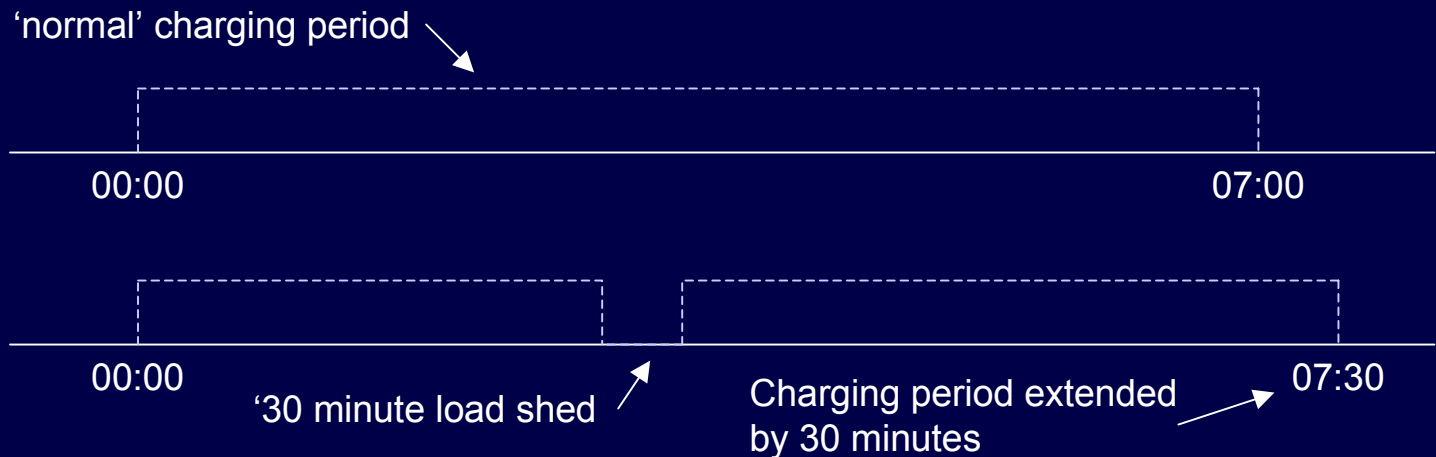
CycloControl

Key features

- ◆ Fast delivery
- ◆ Instant commands

Potential Services

Off-peak fast reserve (short term interruptions)



Current Trial Services

- ◆ Contract signed for trial of **demand profiling** over winter period (~600 MW)
- ◆ Contract signed for trial of **Fast Reserve via Radio Teleswitch** from NGCC (~300 MW) for remainder of this winter
- ◆ Contract signed for trial of **Fast Reserve via CycloControl** (~50 MW)
- ◆ ***NB: Fast Reserve criteria must be met!***
 - ◆ Minimum 50MW delivered within 2 minutes
 - ◆ Sustainable for 15 minutes



Standing Reserve



Standing Reserve

Why do we need it ?

- ◆ **To manage the unplanned mismatch between generation and demand during particular times each day:**
 - Short term plant losses
 - Plant shortfalls
 - Demand forecast error
- ◆ **Recover frequency response capability post-fault**



Standing Reserve in Context

Where does Standing Reserve fit within overall plant / demand margins ?

- ◆ NGC uses cheapest reserve options first
- ◆ Standing Reserve not required all the time
- ◆ If Standing Reserve not available then additional spinning reserve used



Service Definition

- ◆ Response time of 20 minutes or less
- ◆ Provision for at least 2 hours
- ◆ Recovery period 20 hours or less
- ◆ Able to be provided 3 or more times per week
- ◆ Minimum single despatchable volume of 3MW
- ◆ Smaller volumes can be aggregated to comprise the minimum 3MW

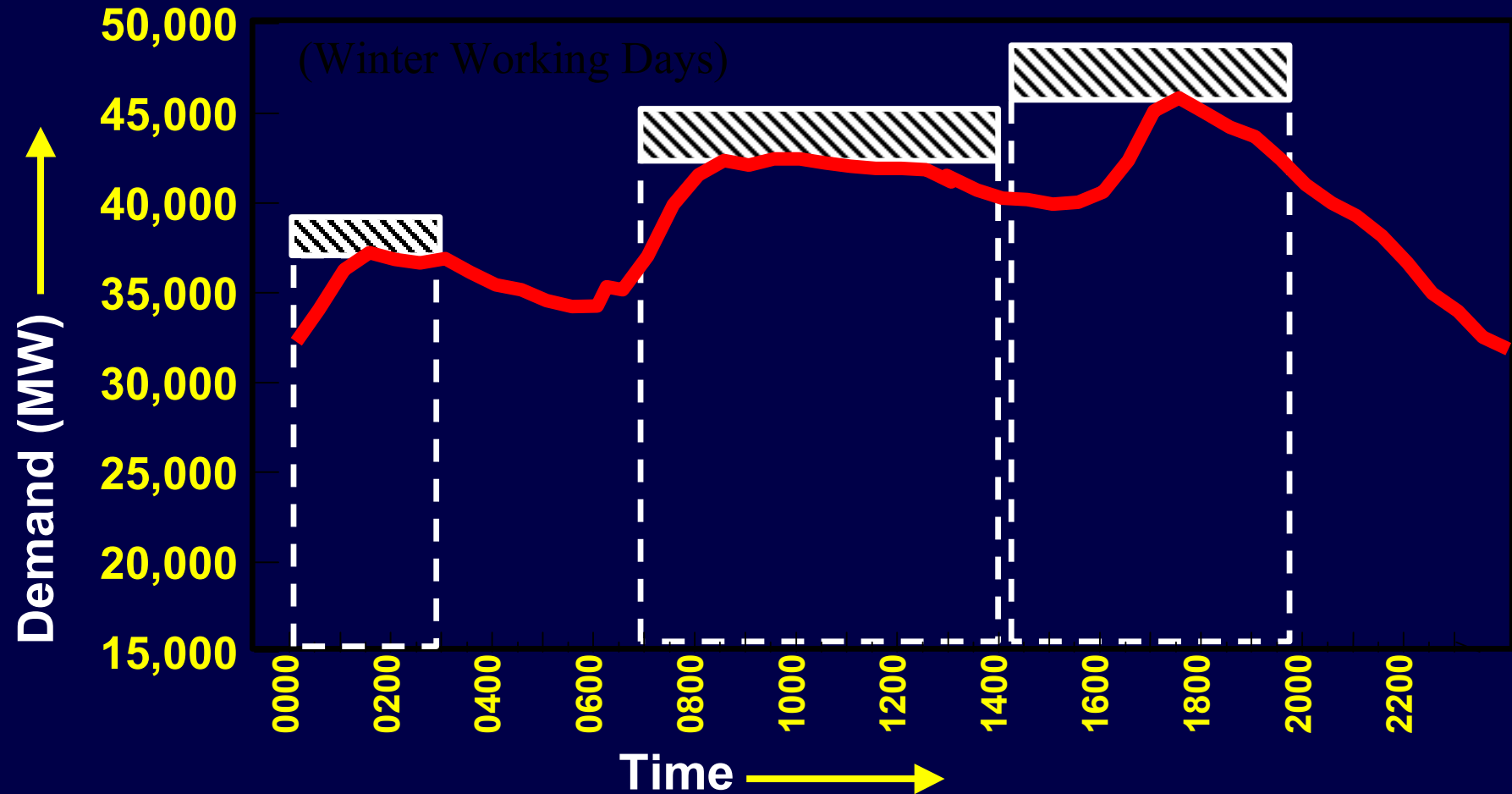


Standing Reserve Service

- ◆ Contracted via annual tender process
 - ◆ Tender duration - 12 months minimum (05:00 1st April to 05:00 1st April)
- ◆ Open to BM and Non-BM providers
- ◆ Open to non-synchronised generation...
 - ◆ Open cycle gas turbines
 - ◆ Pumped storage plant
 - ◆ Industrial stand-by generation
- ◆ ... and demand reduction
 - ◆ Metal smelting, chemical processing, refrigeration etc
 - ◆ Pumped storage plant
- ◆ Procured over specified windows



Standing Reserve Service Windows



Standing Reserve Payments

- ◆ Availability fee (£/MW/h) for maintaining units in a state of readiness to provide reserve
- ◆ Utilisation fee (£/MWh) paid when the service is called off. Payment made against delivered volume.



Utilisation of BM Providers

- ◆ Utilisation is via acceptance of a BOA pursuant to BSC
- ◆ BOA equal to or less than contract price (£/MWh)
- ◆ Despatch via EDL
- ◆ Closed Instructions
- ◆ Imbalance exposure for poor performance

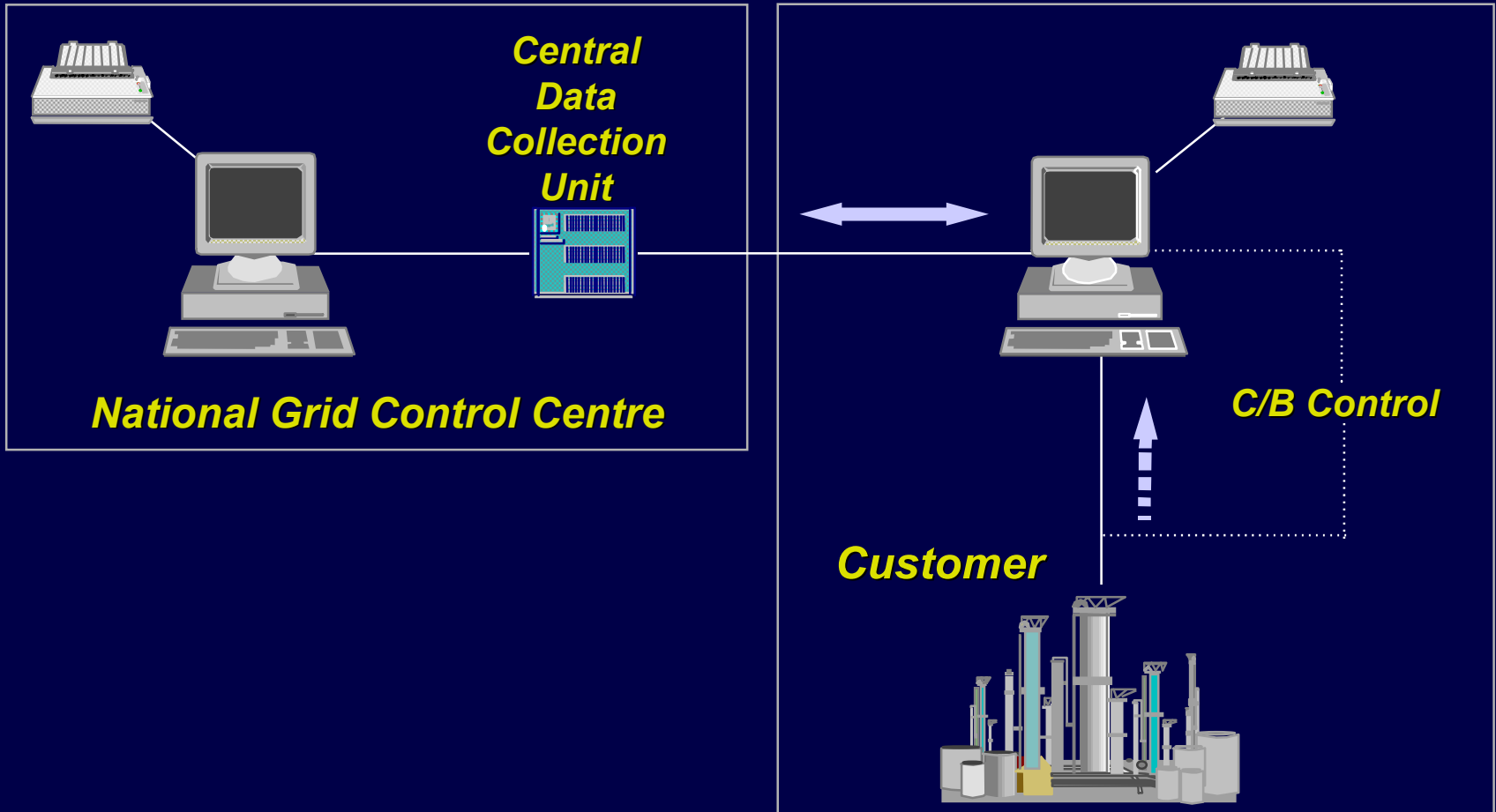


Utilisation for Non-BM Providers

- ◆ Utilisation via contract
- ◆ Despatch via Standing Reserve Despatch (SRD)
- ◆ Energy imbalance payments / costs could be an issue when utilised unless provider opted for P71
- ◆ If not, then risk to be built into prices



Non-BM SR Despatch: SRD



Tender Process

- ◆ **Market Day - 8 November 2002**
- ◆ **Tender Opening - 11 November 2002**
- ◆ **Tender Assessment - 13 December 2002**
- ◆ **RMC sign-off - 11 January 2003**
- ◆ **Notify providers - 17 January 2003**
- ◆ **Agreements signed - 14 March 2003**
- ◆ **Contracts Start - 05:00 1 April 2003**
- ◆ **Report produced - mid July 2003**



ITT Pack Contents

- ◆ Standard Contract Terms
- ◆ Standing Reserve generic agreements for BM and Non-BM providers
- ◆ Explanation and Tender Guidance
- ◆ Tender Sheets and Certificate
- ◆ ASP1 (Ancillary Service Procedure)
- ◆ Report on the 2002/2003 Standing Reserve Tender Round



Standard Contract Terms

- ◆ To facilitate contracting process
- ◆ Provide clarity and transparency
- ◆ Standard terms common to both BM and Non-BM providers
- ◆ Enacted via Standing Reserve Agreement (one for BM and one for Non-BM participants)

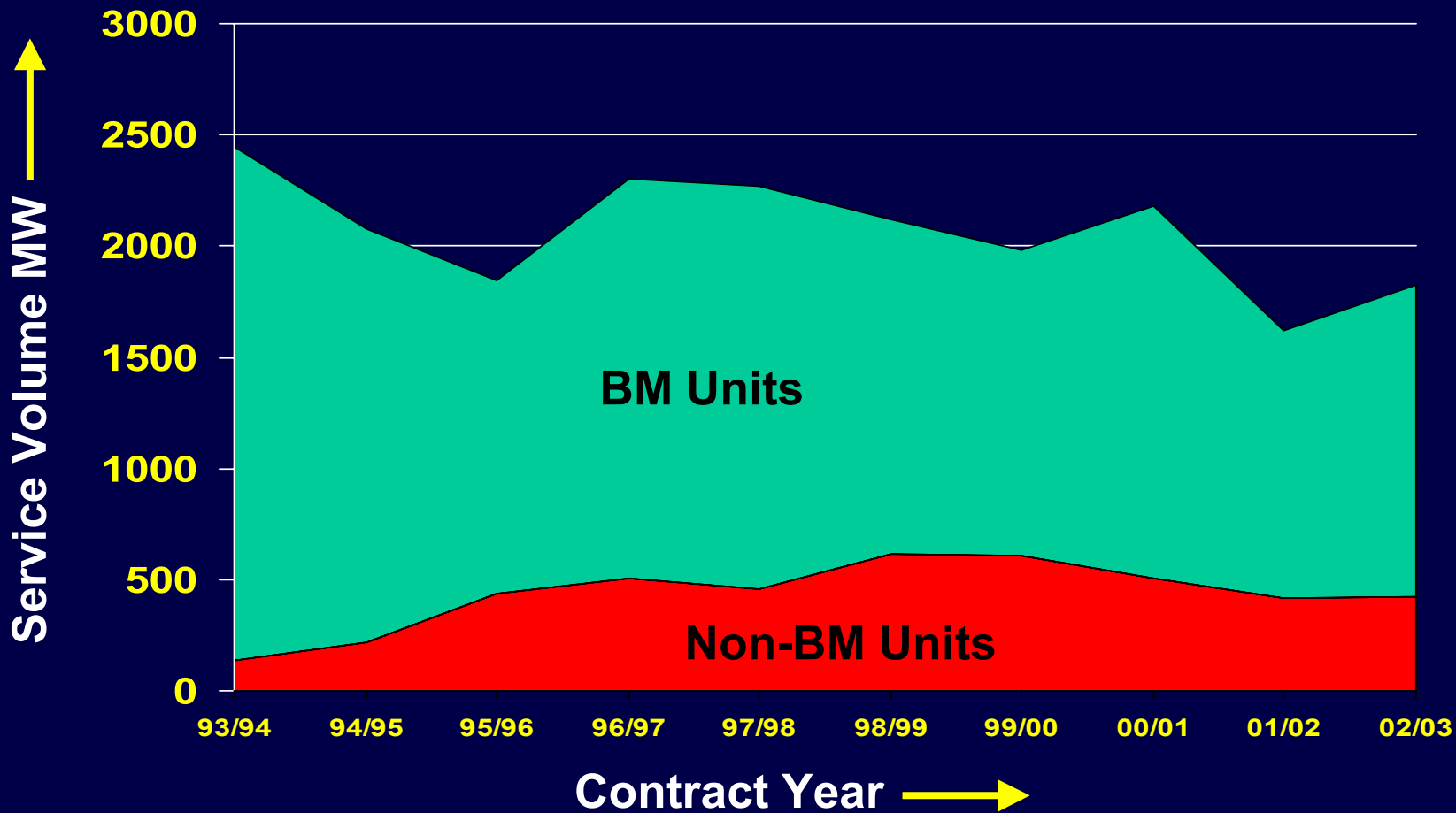


2002/03 Standing Reserve Values

<i>Size MW</i>	<i>Total MW</i>	<i>Units/Sites</i>
<i>0-10</i>	<i>78</i>	<i>12</i>
<i>11-20</i>	<i>434</i>	<i>29</i>
<i>21-30</i>	<i>380</i>	<i>15</i>
<i>31-40</i>	<i>225</i>	<i>6</i>
<i>41-50</i>	<i>0</i>	<i>0</i>
<i>>50</i>	<i>705</i>	<i>6</i>
Total	1822	68



Standing Reserve Volumes



Standing Reserve Update

- ◆ **Standing Reserve 2002/03:**
 - ◆ Demand side tendered 464 MW (19% of total tendered)
 - ◆ 422 MW proceeded to contract
 - ◆ Non-BM capacity comprises 30% of successful tenders
- ◆ **Tender Update for 2003/04**
 - ◆ Tender process opened 11th November 2002
 - ◆ Total MWs tendered ~ 2400MW
 - ◆ 625MW non-BM MW tendered (+6% over last year)



Further Info

Website:

*[www.nationalgrid.com/uk/indinfo/balancing/
mn_services.html](http://www.nationalgrid.com/uk/indinfo/balancing/mn_services.html)*

Industry Forum:

Demand Side Working Group (chaired by Ofgem)

Services to offer?

*[www.nationalgrid.com/uk/indinfo/balancing/
mn_contact_us.html](http://www.nationalgrid.com/uk/indinfo/balancing/mn_contact_us.html)*

