

Constraint Management

Operational Forum: 6th February 2008

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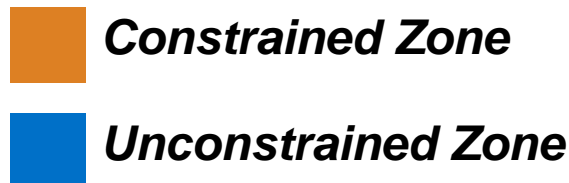
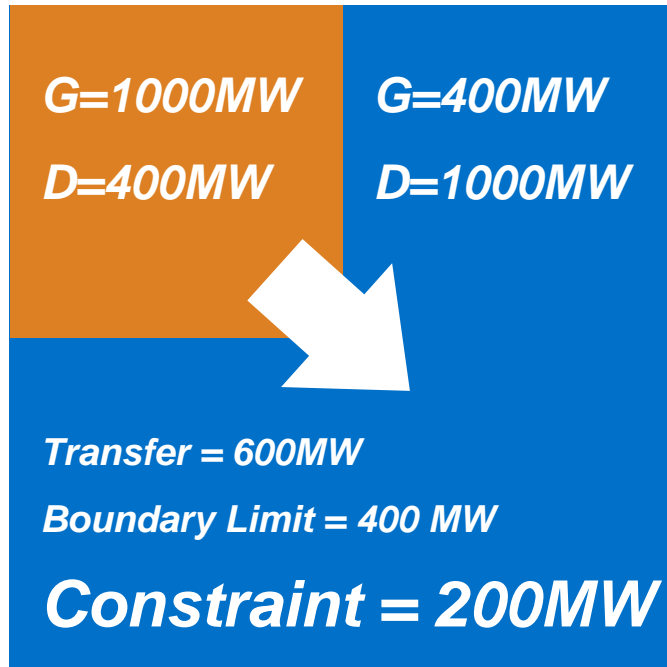
Types of Constraint

- ◆ Thermal (import or export), Voltage, Stability
- ◆ Thermal constraints dominate
- ◆ Can exist pre- and post-fault

The following theoretical examples could apply to either pre-fault constraints or post-fault overloads. Note that, in reality, actions may not be 100% effective on overloads

Following the examples, consideration is given to current mechanisms for constraint management.

Managing Export Constraints

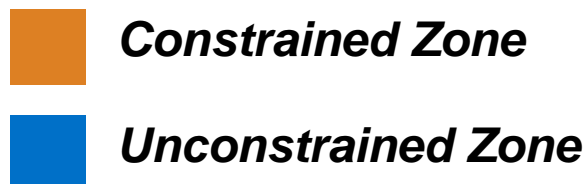
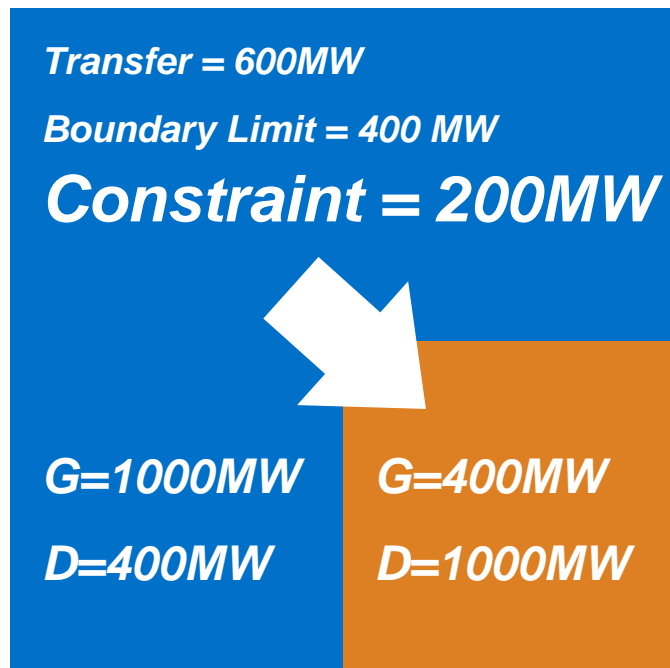


How do we resolve the constraint?

- ◆ Could reduce generation by 200MW in Constrained Zone
- ◆ Not really feasible to increase demand by 200MW within Constrained Zone
- ◆ To have any effect on overload, replacement action must be taken outside Constrained Zone
- ◆ Could increase generation by 200MW or, in theory, reduce demand by 200 MW in Unconstrained Zone

However, cost risk lies with action in Constrained Zone – hence we look to contract within Constrained Zone to reduce risk

Managing Import Constraints



How do we resolve the constraint?

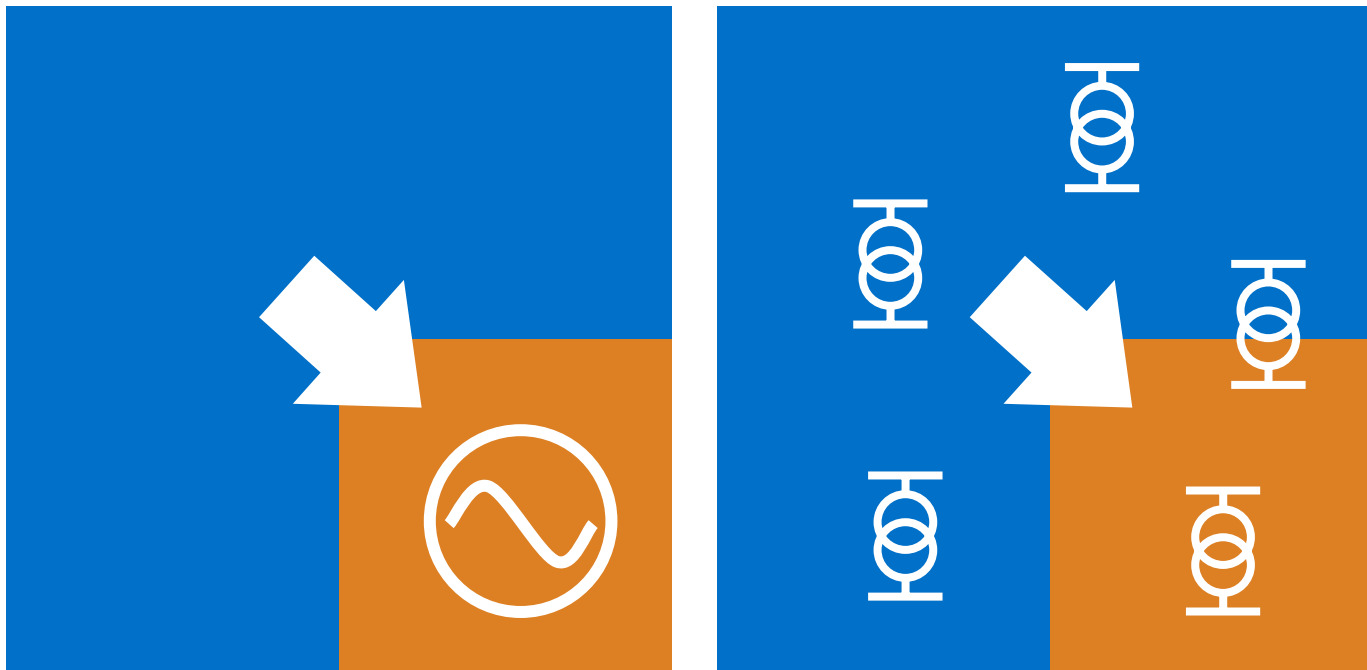
- ◆ Could increase generation by 200MW in Constrained Zone
- ◆ Could (in theory) reduce demand by 200MW within Constrained Zone
- ◆ To have any effect on overload, replacement action must be taken outside Constrained Zone
- ◆ Could reduce generation by 200MW in Unconstrained Zone. Not really feasible to increase demand by 200MW outside Constrained Zone

Again, cost risk lies with action in Constrained Zone – hence we look to contract within Constrained Zone to reduce risk

Generation vs. Demand

Demand may need aggregation to be of comparable size to generation

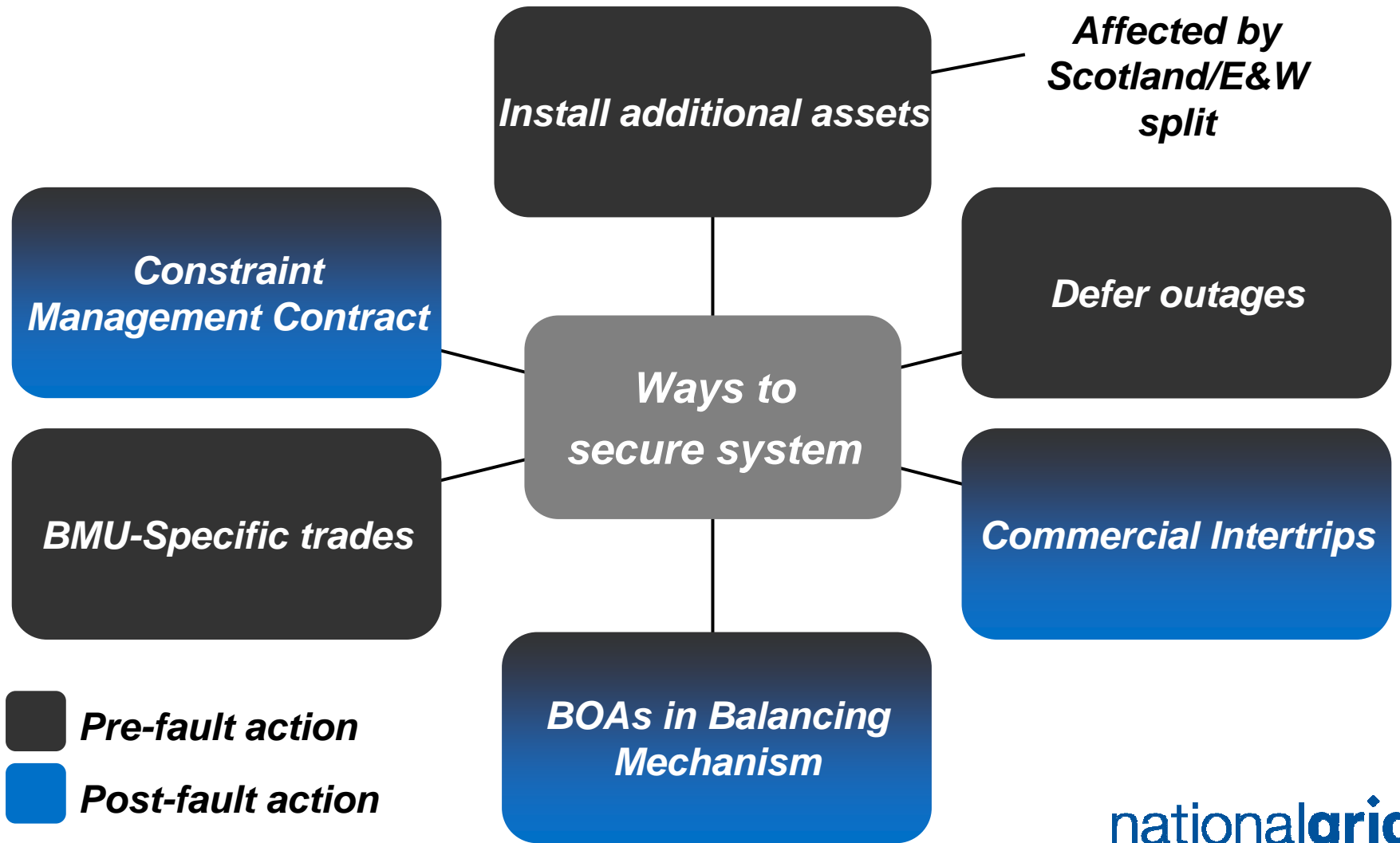
Demand reduction may be required pre- or post-fault for significant duration (e.g. 12 hours)



 **Constrained Zone**

 **Unconstrained Zone**

Options for Constraint Management



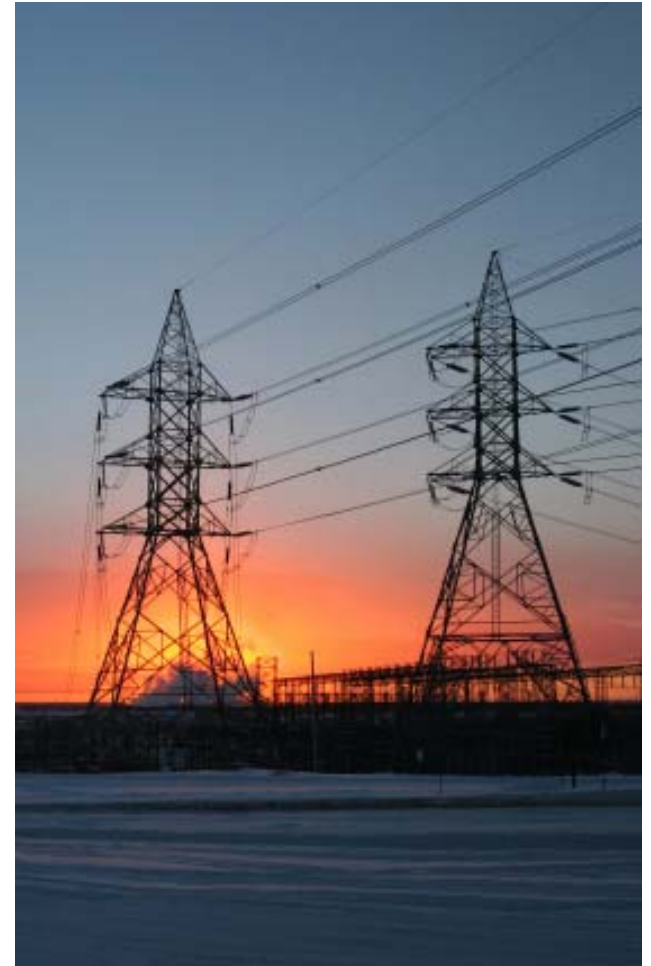
Install Additional Assets

Pros

- ◆ Robust solution
- ◆ Can also enhance asset performance e.g. by hotwiring (E&W only)

Cons

- ◆ Expensive
- ◆ Planning consent issues
- ◆ Takes time to install



Defer Outages of Circuits

Pros

- ◆ Avoids constraint

Cons

- ◆ Disrupts construction programme
- ◆ Increases outage requirements for following year
- ◆ Constraint may re-emerge



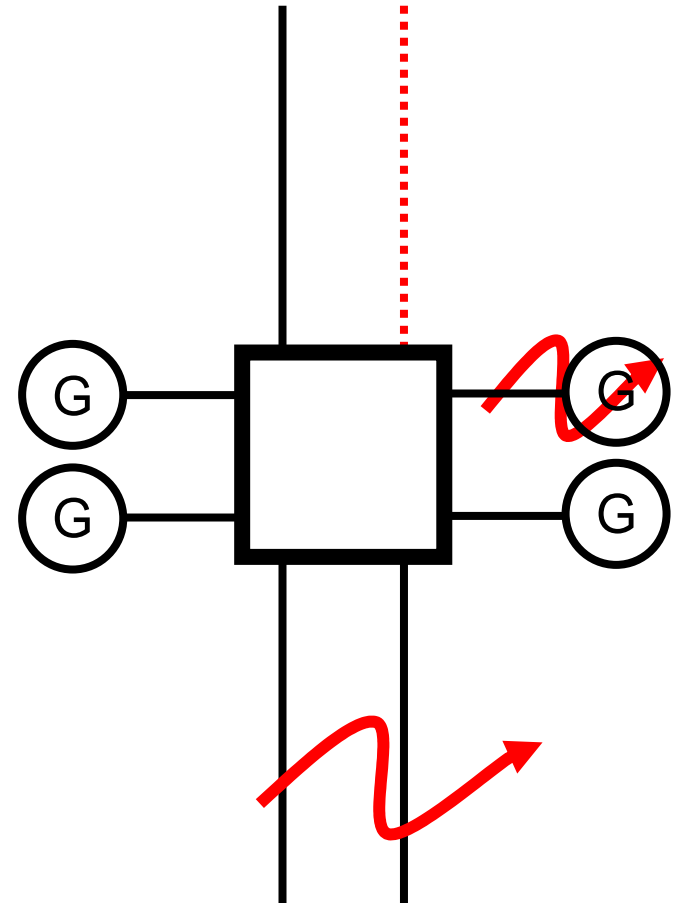
Commercial Intertrips

Pros

- ◆ Cost-effective solution to low-probability event
- ◆ Avoids constraining generation before fault occurs
- ◆ Armed pre-fault, delivers post-fault

Cons

- ◆ Subject to agreement of prices
- ◆ Retro-fit of generator intertrip equipment can be expensive
- ◆ Lack of interest in service due to risk to plant
- ◆ Limit to amount of MW that can be armed – max MW loss considerations
- ◆ Long lead-times to install/amend schemes (for TO)



Bid-Offer Acceptances in BM

Pros

- ◆ Available in short-timescales
- ◆ Lower risk of paying for something you don't need
- ◆ Transparent prices
- ◆ Can be used pre- and post-fault

Cons

- ◆ Prices can change every half-hour - may end up paying a lot of money
- ◆ No guaranteed availability
- ◆ Potential imbalance price pollution

BMU-Specific Trades

Pros

- ◆ Available in relatively short timescale
- ◆ Some ability to negotiate price

Cons

- ◆ Still exposed to uncertain prices
- ◆ Entered into pre-fault against expectation of constraint which may not materialise

Constraint Management Contract

Pros

- ◆ Guarantees availability and prices
- ◆ Removes exposure to costs in BM
- ◆ Agreed pre-fault, may encompass both pre- and post-fault actions
- ◆ Doesn't pollute imbalance prices

Cons

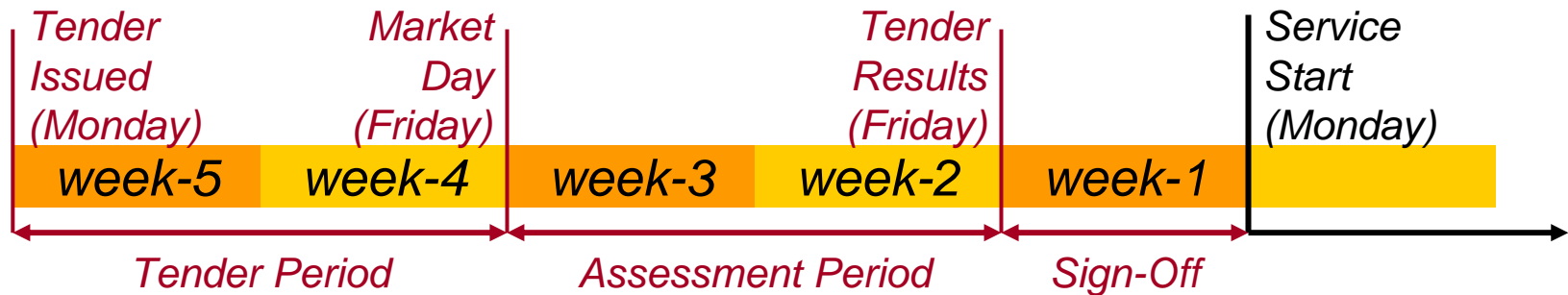
- ◆ Negotiating position can be weak
- ◆ Difficult to agree prices
- ◆ Legal drafting and agreement can take some time
- ◆ May pay for something that you don't need/use
- ◆ Lack of transparency

New Constraint Management Service

- ◆ Attempts to address negative aspects of current constraint management services:
 - ◆ Transparent, competitive procurement process
 - ◆ Increased price certainty
 - ◆ Reduced risk of paying for something you don't need
 - ◆ Minimises pollution of imbalance prices
- ◆ Developments since issue of Draft 1 terms:
 - ◆ Now able to tender either indexed or fixed prices
 - ◆ Open to both BM and non-BM providers (subject to meeting locational and volume requirements)
 - ◆ Now accounts for cost of CO₂ emissions

Procurement

- ◆ Procurement at Monthly resolution, for single or multi-month service
- ◆ Likely tender timescales:



- ◆ Tender will require indicative maximum instructable block size (can be aggregated)
- ◆ Market Report will be produced

Next Steps

- ◆ Draft 2 service terms available on website, along with Q&A sheet
- ◆ Happy to discuss bilaterally – please get in touch (ian.pashley@uk.ngrid.com, 01926 653446)
- ◆ Invitation to Tender expected to be issued around 22nd February
- ◆ Planned service commencement: 31st March 2008