

Transpower NZ Ltd System Operator Industry Seminar 13/15 September 2006

Pricing of the 17:30 Trading Period 19th June 2006

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Reserve Management Net Free Reserves (NFR)

System Operator Industry Seminar
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13/15 September 2006

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Contents

- Sources of Net Free Reserves (NFR's)
- How Scheduling Pricing & Dispatch (SPD) and Reserve Management Tool (RMT) interact



Sources of Net Free Reserve (NFR)

- NFR accounts for undispached reserves available in the system (increases NFR)
 - AUFLS
 - Load damping
 - Free hydro reserve in the North Island
 - HVDC reserve sharing
- it also accounts for non-compliant generation (decreases NFR)



How SPD and RMT interact

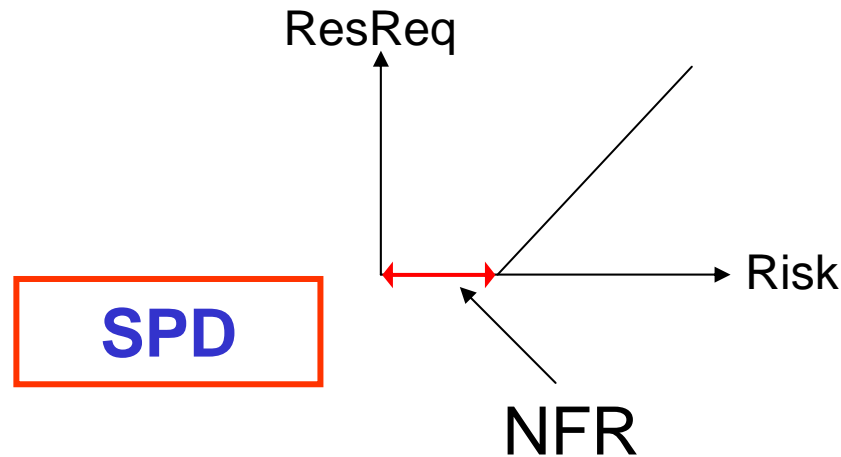
- SPD SDS produced at 07:00 each day includes next (new) trading day

SPD

- schedule has rolled over NFR's from current day applied to next (new) trading day



How SPD and RMT interact

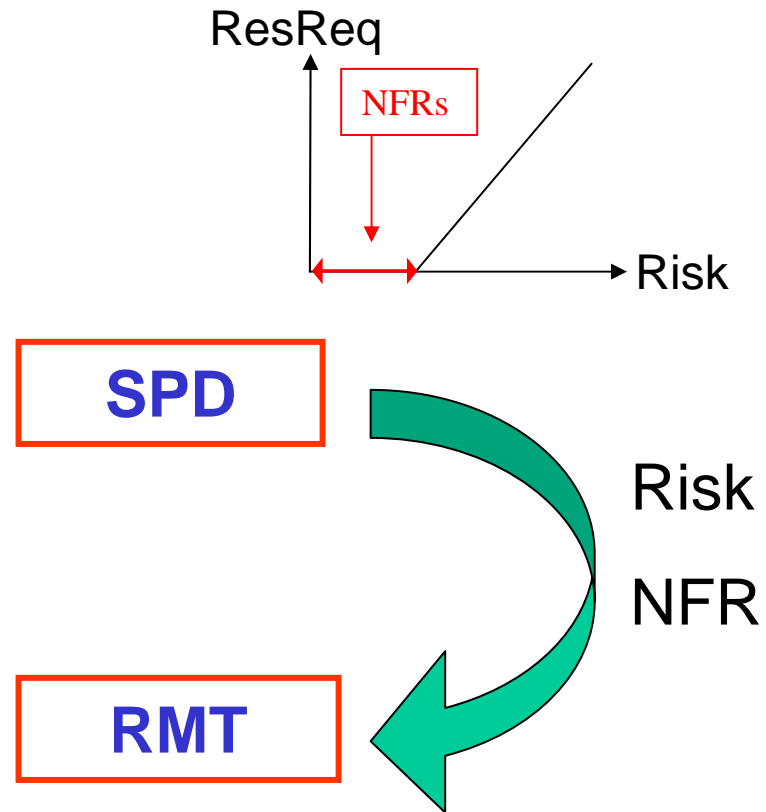


- cleared risk energy above the NFR must be covered by reserve
- SPD co-optimised risk energy against reserve procured given NFR's



How SPD and RMT interact

- SPD output goes to RMT
 - risk
 - AC CE
 - DC CE
 - DC ECE
 - all energy and reserve cleared
 - NFR values already in SPD



How SPD and RMT interact

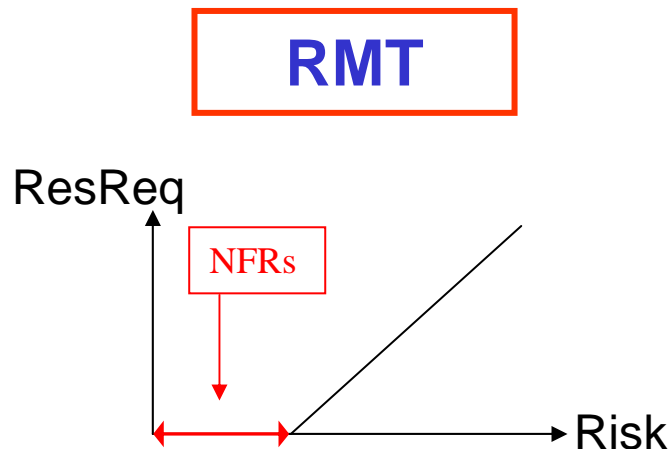
- RMT simulates frequency fall for each contingency based on:
 - all energy and reserve cleared
 - risk energy and reserve cleared
 - NFR's from SPD
 - non-compliant plant
- determines if enough reserve available

RMT



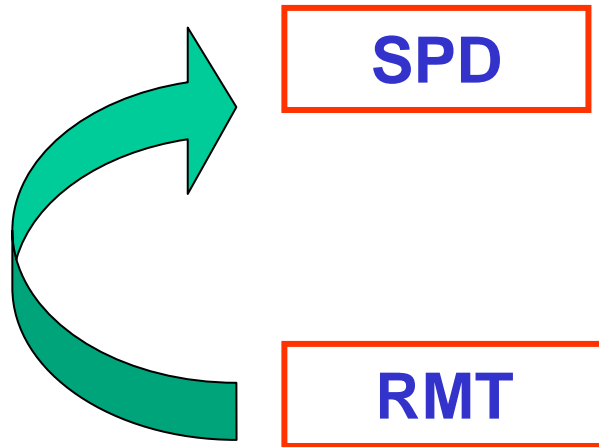
How SPD and RMT interact

- dependent on solution outcomes:
 - can decrease NFR's as not enough reserve cleared in SPD
 - can increase NFR's as too much reserve cleared in SPD
 - can remain unchanged as adequate reserve cleared in SPD
- RMT models reserve as that required above system reserve

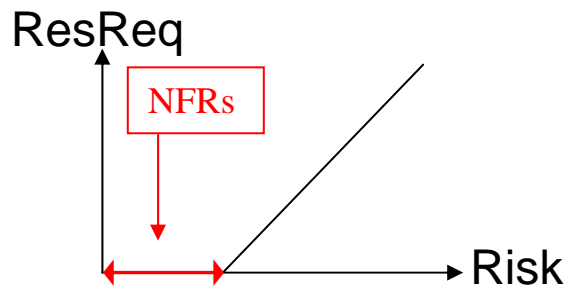


How SPD and RMT interact

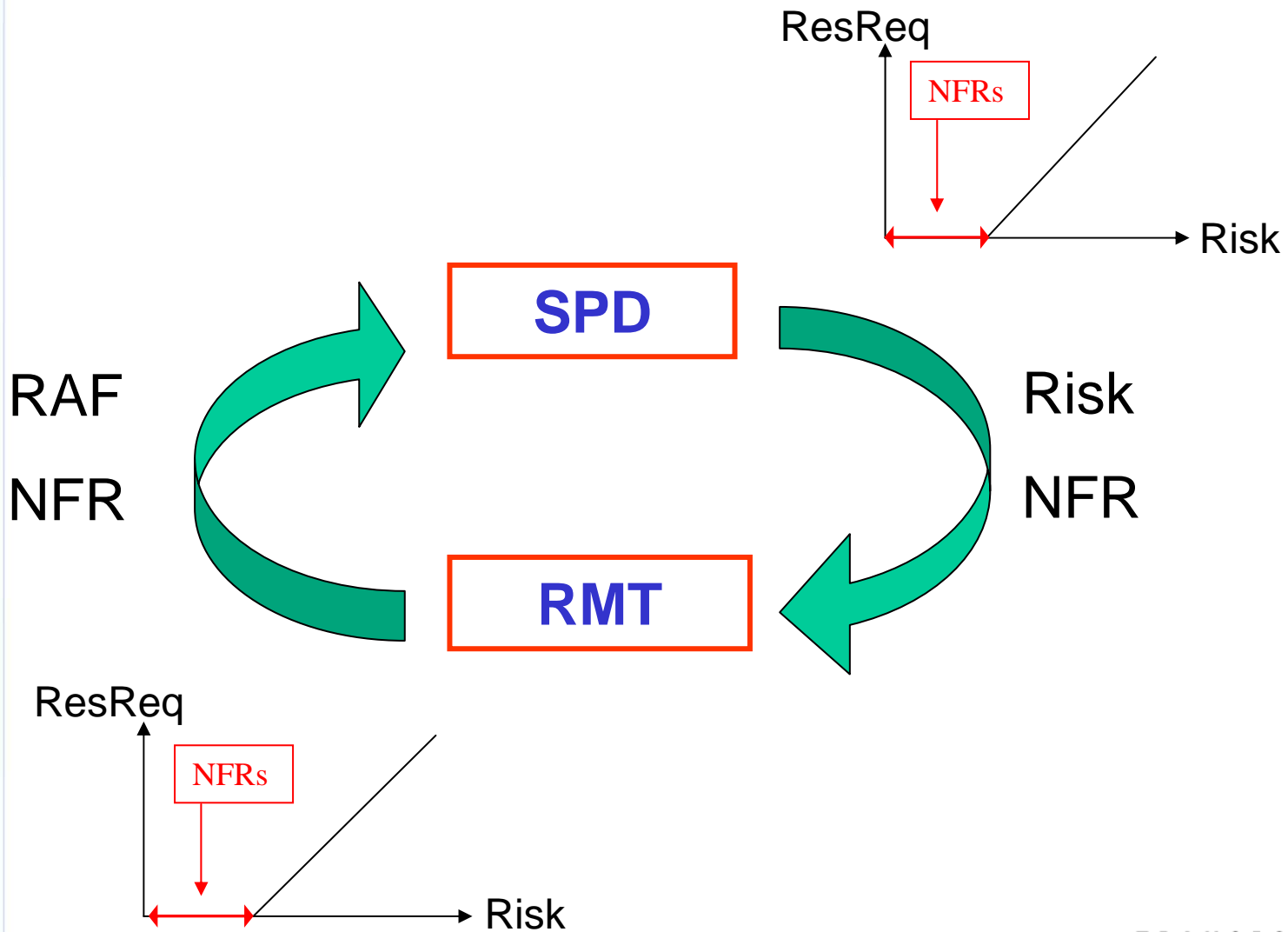
RAF
NFR



- RMT outputs revised numbers to SPD for:
 - CE HVDC NFR
 - ECE HVDC NFR
 - CE AC NFR
- RAF's can only be 0 or 1



How SPD and RMT interact



How SPD and RMT interact – pre-2004

