

SFT Customer Workshop

11 December 2009

TRANSPower



Agenda

- Purpose is to agree, as industry participants, what information the industry requires before SFT is implemented
 - Introduction and broad constraints on the System Operator in introducing SFT
 - A detailed overview of SFT in action to ensure everyone understands how the tool works
 - Facilitated discussion/forum to agree the industry requirements (such as training and information) for SFT go live



Agenda Times

9 – 9.15am	Introduction - Kieran Devine
9.15 – 10.15am	SFT Demonstration – Chris Callaghan/Lynette Bell
10.15 – 10.30am	Morning Tea
10.30 – 12.00pm	Agreeing the implementation plan – Ray Hardy



Introduction

- SFT, What is it:
 - Simultaneous Feasibility Test
 - “automated calculation of constraints”
- SFT, What will it do for you:
 - More accurate real time transmission capacity
- Project timetable:
 - SFT go-live Planning late August 2010
 - SFT go-live in Real Time late October 2010
- System Operator Issues:
 - Timeframes
 - Resources for industry development
 - Link with Variable and Dynamic Transmission Ratings



SFT Demonstration

1. What is SFT?
2. SFT Modes
3. SPD-SFT Iteration Loop
4. Case Setup
5. SFT AC vs DC Solutions
6. Constraint Identification & Types
7. Constraint Formulation & Naming
8. Constraint Evolution & Stability
9. Case Setup & Output [demo]
10. Schedule Types
11. Constraint Publication



What is SFT?

- What if scheduled power flow from SPD could be automatically tested to discover if it simultaneously satisfied network security constraints?
- What if this process could identify additional constraints arising from contingency analysis?
- Outcome: SPD and security solutions are both feasible
- SFT – “Simultaneous Feasibility Test”
 - Iterative automated process
 - Checks SPD solution using AC Contingency Analysis
 - Automatically generate additional constraints to ensure network security



What is SFT?

- Standard load flow/contingency analysis application
- Enhanced to calculate thermal security constraints
- Matches SPD model injections to AC power flow model, making use of time based profiles including:
 - Auxiliary voltage setpoint profiles
 - Auxiliary MVA_r load profiles
 - Switching schedules of capacitor/reactor components
- Profiles generally modelled by month with multiple breakpoints per day



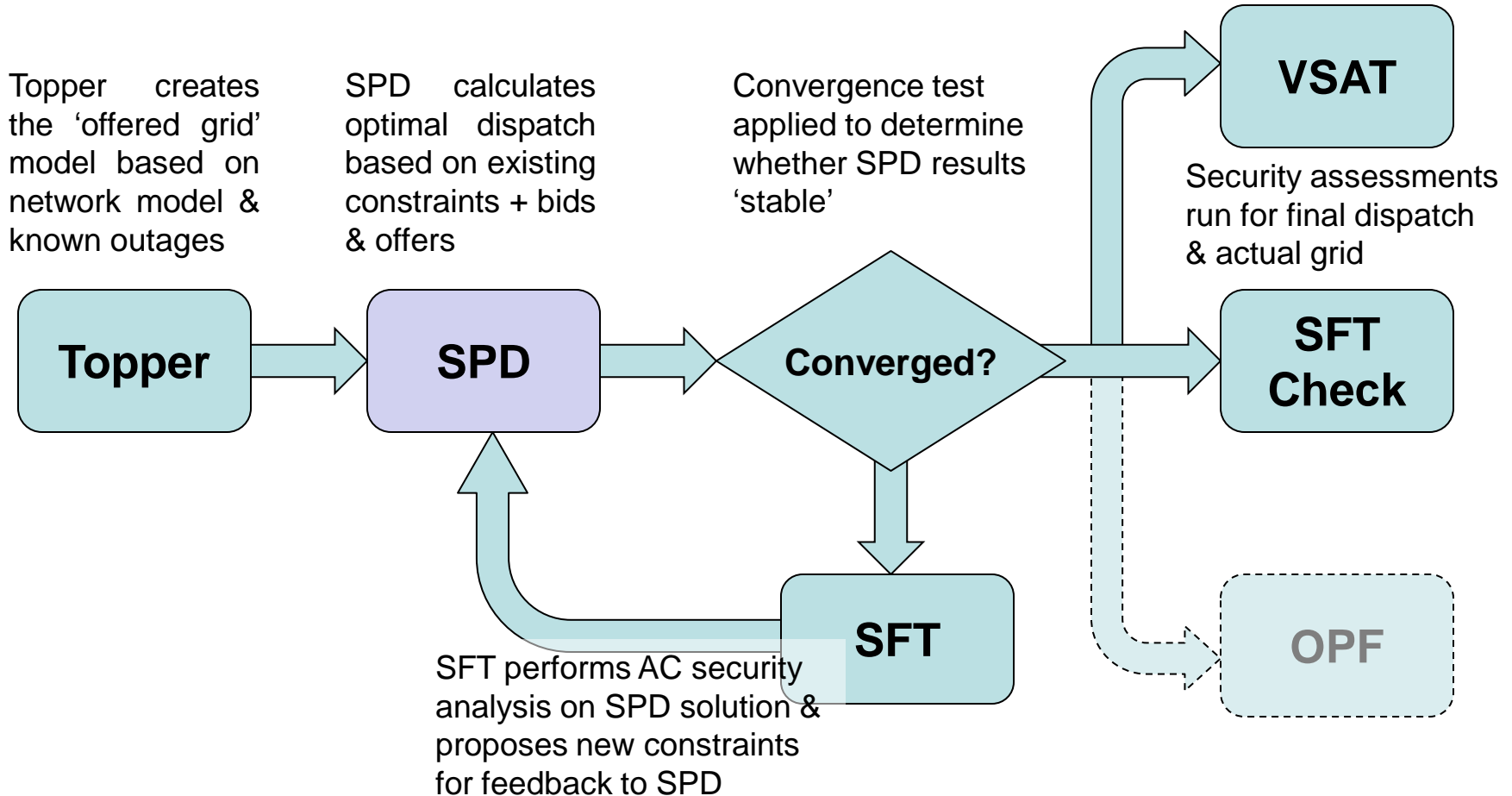
SFT Modes

- SFT runs in several different 'modes':

TOPPER	Generates 'offered grid' model for SPD based on known outages & 'forced closed' breaker lists
SFT	Analyses SPD solution for contingent branch violations & generates constraints
SFT Check	Performs security check on final SPD result based on actual grid (no 'forced closed' breakers)
VSAT	Analyses SPD solution for voltage stability issues & advises constraints
OPF	Advises optimal dispatch of MVAR resources (not commissioned)



SPD-SFT Iteration Loop



SFT AC vs DC Solves

- Achieving AC solution consistently across multiple studies depends on robust reactive & voltage profiles
- If an AC solution can not be achieved then SFT will automatically switch to a solution mode with a non-linear DC power flow analysis
- The reactive power flows on the branches are zeroed out for the non-linear DC solution
- Since SPD solves a constrained DC power flow, SFT is virtually guaranteed of achieving a DC solution also
- In planning time it is feasible to manipulate the auxiliary inputs to achieve an AC solution



Constraint Identification

- SFT identifies constraints for violating or near violating flows for both the base case and contingency cases
- Near binding constraints are created for those branches whose flows are within a single system-wide configurable threshold of the limit e.g within 85%
- If only the constraints for the violated limit are reported there is a chance that if the dispatch and flow pattern change in the subsequent SPD solution, the flows that were near violating may become violations & require a second iteration of constraint generation to resolve



Constraint Types

Static

- A constraint designed to avoid base-case or contingent overload of an asset's static limit
- Applies to transformers & circuits

Thermal/Off-load

- A constraint designed to avoid base-case or contingent overload of an asset's thermal limit
- Applies to circuits only

-
- SFT will build constraints for both types of constraint if both are violated
 - Ensures both limits will be respected if one is lower but is alleviated more easily



Constraint Formulation

- SFT uses the same current methodology to formulate constraints except it is now automated.
- The form of the constraint is still the same i.e

$$ax + by \leq z$$

a & b = Coefficients

x & y = Protected & Contingent
Branch Flows

z = RHS



Constraint Naming Convention

Protected Branch	Contingent Branch	:S	Contingency Name	Violating Station	Branch Type
Network model identification of the protected branch (circuit or transformer)	Network model identification of the contingent branch (circuit or transformer)	'Flag' indicating this is a constraint for a static limit violation (circuits only)	Contingency definition resulting in the violation	Station where the worst violation occurs (circuits only)	Code indicating protected branch type: <ul style="list-style-type: none">•LN = circuit•XF = transformer•ZBR = zero impedance branch



Constraint Name Examples

ARA_WRK.1 __ MTI_WKM1.1 __ :S __ MTIWKM1\$ __ ARA __ LN

ARA_WRK.1 __ ALB__T4 __ :S __ ALB_T4 __ ARA __ LN

ARA_WRK.1 __ MTI_WKM1.1 __ MTIWKM1\$ __ ARA __ LN

ARA_WRK.1 __ ALB__T4 __ ALB_T4 __ ARA __ LN

ALB__T3__33KV __ MTI_WKM1.1 __ MTIWKM1\$ __ XF

ALB__T3__33KV __ ALB__T4 __ ALB_T4 __ XF



Constraint Naming Convention

Monitored Element	Naming Convention	Example
Line	LN: ID_LINE (14 char) of the monitored element + "." + ID_LN (2 char) of the monitored element + "_" + ID_LINE (14 char) of the contingency element + "." + ID_LN (2 char) or ID_ZBR (2 char) of the contingency element + "_" + optional ":S_" for static limit constraints + ID_CTG (8 char) + "_" + ID_ST(8 char) of the end where the violation is detected + "_LN"	Static Limit "ARA_WRK.1__MTI_WKM1.1__:S__MTIWKM1\$__ARA__LN" "ARA_WRK.1__ALB_T4__:S__ALB_T4__ARA__LN" Thermal Limit: "ARA_WRK.1__MTI_WKM1.1__MTIWKM1\$__ARA__LN" "ARA_WRK.1__ALB_T4__ALB_T4__ARA__LN"
Zero Impedance Branch	ZBR: ID_LINE (14 char) of the monitored element + "." + ID_ZBR (2 char) of the monitored element + "_" + ID_LINE (14 char) of the contingency element + "." + ID_LN (2 char) or ID_ZBR (2 char) of the contingency element + "_" + ID_CTG (8 char) + "_" + ID_ST(8 char) of the end where the violation is detected + " :_ZBR"	"KILN_COGEN.1__MTI_WKM1.1__MTIWKM1\$__GLN__ZBR" "KILN_COGEN.1__ALB_T4__ALB_T4__GLN__ZBR"
Transformer	XF: ID_ST(8 char) + "_" + ID_XF (14 char) of the monitored element + "_" + ID_KV (4 char) of the end where violation is detected + "KV_" + ID_LINE (14 char) of the contingency element + "." + ID_LN (2 char) or ID_ZBR (2 char) of the contingency element + "_" + ID_CTG (8 char) + "_XF"	"ALB__T3__33KV__MTI_WKM1.1__MTIWKM1\$__XF" "ALB__T3__33KV__ALB_T4__ALB_T4__XF"
Monitored Interface	INTRFC: ID_INTRFC (6 char) of the monitored element + "_" + ID_LINE (14 char) of the contingency element + "." + ID_LN (2 char) or ID_ZBR (2 char) of the contingency element + "_" + ID_CTG (8 char) + "_INTRFC"	"Zone1_11__MTI_WKM1.1__MTIWKM1\$__HEN__INTRFC" "Zone1_11__ALB_T4__ALB_T4__HEN__INTRFC"



Constraint Evolution

- Changes to the values of the coefficients and RHS of a SFT constraint is usually of very small magnitude between subsequent solves of schedules
- In most cases the number and types of constraints appearing a week out for WDS schedules continue to RTD
- Exception would be in case of system events or when there is a significant change to offers



Constraint Evolution

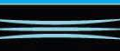
Changes to Constraint Build between SDS and SDPQ

HISTORY FOR WIL__T8__220KV__HAY_TKR2.1__HAY_TKR2__XF_RHS, Trading Period 17 on 09/06/2009

Run Type	Run Time	Formula	Limit (MW)	Solution (MW)	% Binding
SDPQ	09/06/2009 08:10:01	.143 * HAY_TKR2.1 + 1 * WIL_T8.T8 <=	145.850	145.850	100
SDS	09/06/2009 08:03:01	.144 * HAY_TKR2.1 + 1 * WIL_T8.T8 <=	146.240	146.240	100

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Constraint Evolution

Changes to Constraint Build between subsequent SDPQ schedules

HISTORY FOR WIL__T8__220KV__HAY_TKR1.1__HAY_TKR1__XF_RHS, Trading Period 20 on 09/06/2009

Run Type	Run Time	Formula	Limit (MW)	Solution (MW)	% Binding
SDPQ	09/06/2009 09:10:00	.144 * HAY_TKR1.1 + 1 * WIL_T8.T8 <=	146.430	146.430	100
SDPQ	09/06/2009 08:40:00	.144 * HAY_TKR1.1 + 1 * WIL_T8.T8 <=	146.500	146.500	100
SDPQ	09/06/2009 08:10:01	.143 * HAY_TKR1.1 + 1 * WIL_T8.T8 <=	146.200	146.200	100
SDS	09/06/2009 08:03:01	.144 * HAY_TKR1.1 + 1 * WIL_T8.T8 <=	146.610	146.610	100

This page refreshes automatically every 5 minutes. Last refreshed at 09 June 2009 09:25:38

[Close](#)



Case Setup

Solver Controls : Case Control



Tooltray

Case Selection

Case Selection

From: 09-nov-2009 00:00

To: 10-nov-2009 00:00

All Cases [Apply]

Show: Case Name

Find:

Cases

- RTD
- RTP
- SDPQ
 - Auto SDPQ 09-NOV-09 07:00 657
 - Auto SDPQ 09-NOV-09 06:30 633
 - Auto SDPQ 09-NOV-09 06:00 620
 - Auto SDPQ 09-NOV-09 05:30 603
 - Auto SDPQ 09-NOV-09 05:00 590
 - Auto SDPQ 09-NOV-09 04:30 575
 - Auto SDPQ 09-NOV-09 04:00 561
 - Auto SDPQ 09-NOV-09 03:30 545
 - Auto SDPQ 09-NOV-09 03:00 530
 - Oper SDPQ 09-NOV-09 03:03 524
 - Oper SDPQ 09-NOV-09 02:57 517
 - Auto SDPQ 09-NOV-09 02:30 505
 - Auto SDPQ 09-NOV-09 02:00 492
 - Auto SDPQ 09-NOV-09 01:30 477
 - Auto SDPQ 09-NOV-09 01:00 461
 - Oper SDPQ 09-NOV-09 00:43 442
 - Auto SDPQ 09-NOV-09 00:30 439
 - Oper SDPQ 09-NOV-09 00:28 423
 - Auto SDPQ 09-NOV-09 00:00 414

Case Detail

Case Id: 81232009111800657

Case Type: SDPQ

Case Owner: William Huggins

Period Start: 09-nov-2009 07:00

Period End: 09-nov-2009 10:30

Case State: Approved

Completed: 09-nov-2009 07:11

SFT: No

SFT Check: Yes

DCSA:

RMT:

Setup for Case: Auto SDPQ 09-NOV-09 07:00 657

Case ID: 81232009111800657

Name: Auto SDPQ 09-NOV-09 07:00 657

Description: Study created by DBMS Job Scheduler

NetMDM: case_netmodel_netmom.tp_csm_20091104

Ctg Case: case_netmodel_ctgs.tp_ems_20091012

Start: 09-nov-2009 07:00

End: 09-nov-2009 11:00

State: Approved

Priority: 400

Type: SDPQ

Scenario:

Run Sub Study: DCSA

Auto Approve Use MTLF

Auto Archive Use SFT Constraint

Auto Publish Use MV90 Override

History

Created:	09-nov-2009 07:10
Executed:	09-nov-2009 07:10
Solved:	09-nov-2009 07:11
Approved:	09-nov-2009 07:11
Archived:	09-nov-2009 07:11

New Run

Duplicate Pause

Delete Continue

Approve Stop

Archive Publish

Workflow Tasks for Case: Auto SDPQ 09-NOV-09 07:00 657

	Export	Copy	Topper	SPD	SFT	SFTCheck	BSC	OPF	VSAT	PSC
Skip	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Status	OK	Skip	OK	OK	Skip	AC Solved	Skip	Skip	OK	OK


Messages for Case: Auto SDPQ 09-NOV-09 07:00 657

Message Set	Timestamp	Text
VSAT-Loader	09-nov-2009 07:11:39	WNMS-SPD2: Case(Auto SDPQ 09-NOV-09 07:00 657) VSAT-Loader 09-NOV-2009 09:00 started
VSAT	09-nov-2009 07:11:39	WNMS-SPD2: Case(Auto SDPQ 09-NOV-09 07:00 657) VSAT(MSS2) 09-NOV-2009 09:00 ended normally,
PSC	09-nov-2009 07:11:33	PWMDB: Case(Auto SDPQ 09-NOV-09 07:00 657) PSC 09-NOV-2009 10:00 ended normally, code=1
PSC	09-nov-2009 07:11:33	PWMDB: Case(Auto SDPQ 09-NOV-09 07:00 657) PSC 09-NOV-2009 10:00 started
VSAT-Loader	09-nov-2009 07:11:33	WNMS-SPD6: Case(Auto SDPQ 09-NOV-09 07:00 657) VSAT-Loader 09-NOV-2009 10:00 ended normally,
IMPORTER	09-nov-2009 07:11:33	wnms-spd6: Loading file: \\WNMS-FS1\MSSOL\export\MSS_81232009111800657_OX_09-NOV-2009_10_
VSAT-Loader	09-nov-2009 07:11:33	WNMS-SPD6: Case(Auto SDPQ 09-NOV-09 07:00 657) VSAT-Loader 09-NOV-2009 10:00 started
VSAT	09-nov-2009 07:11:33	WNMS-SPD4: Case(Auto SDPQ 09-NOV-09 07:00 657) VSAT(MSS2) 09-NOV-2009 10:00 ended normally,
PSC	09-nov-2009 07:11:31	PWMDB: Case(Auto SDPQ 09-NOV-09 07:00 657) PSC 09-NOV-2009 09:30 ended normally, code=1
PSC	09-nov-2009 07:11:31	PWMDB: Case(Auto SDPQ 09-NOV-09 07:00 657) PSC 09-NOV-2009 09:30 started
VSAT-Loader	09-nov-2009 07:11:31	WNMS-SPD4: Case(Auto SDPQ 09-NOV-09 07:00 657) VSAT-Loader 09-NOV-2009 09:30 ended normally,
IMPORTER	09-nov-2009 07:11:31	wnms-spd4: Loading file: \\WNMS-FS1\MSSOL\export\MSS_81232009111800657_OX_09-NOV-2009_09_
VSAT-Loader	09-nov-2009 07:11:31	WNMS-SPD4: Case(Auto SDPQ 09-NOV-09 07:00 657) VSAT-Loader 09-NOV-2009 09:30 started
VSAT	09-nov-2009 07:11:31	WNMS-SPD6: Case(Auto SDPQ 09-NOV-09 07:00 657) VSAT(MSS1) 09-NOV-2009 09:30 ended normally,
PSC	09-nov-2009 07:11:29	PWMDB: Case(Auto SDPQ 09-NOV-09 07:00 657) PSC 09-NOV-2009 10:30 ended normally, code=1
PSC	09-nov-2009 07:11:29	PWMDB: Case(Auto SDPQ 09-NOV-09 07:00 657) PSC 09-NOV-2009 10:30 started
VSAT-Loader	09-nov-2009 07:11:29	WNMS-SPD7: Case(Auto SDPQ 09-NOV-09 07:00 657) VSAT-Loader 09-NOV-2009 10:30 ended normally,
IMPORTER	09-nov-2009 07:11:29	wnms-spd7: Loading file: \\WNMS-FS1\MSSOL\export\MSS_81232009111800657_OX_09-NOV-2009_10_
VSAT-Loader	09-nov-2009 07:11:29	WNMS-SPD7: Case(Auto SDPQ 09-NOV-09 07:00 657) VSAT-Loader 09-NOV-2009 10:30 started
VSAT	09-nov-2009 07:11:29	WNMS-SPD5: Case(Auto SDPQ 09-NOV-09 07:00 657) VSAT(MSS1) 09-NOV-2009 10:30 ended normally,
PSC	09-nov-2009 07:11:13	PWMDB: Case(Auto SDPQ 09-NOV-09 07:00 657) PSC 09-NOV-2009 07:00 ended normally, code=1
PSC	09-nov-2009 07:11:12	PWMDB: Case(Auto SDPQ 09-NOV-09 07:00 657) PSC 09-NOV-2009 07:00 started
VSAT-Loader	09-nov-2009 07:11:12	WNMS-SPD6: Case(Auto SDPQ 09-NOV-09 07:00 657) VSAT-Loader 09-NOV-2009 07:00 ended normally,
IMPORTER	09-nov-2009 07:11:12	wnms-spd6: Loading file: \\WNMS-FS1\MSSOL\export\MSS_81232009111800657_OX_09-NOV-2009_07_
VSAT-Loader	09-nov-2009 07:11:12	WNMS-SPD6: Case(Auto SDPQ 09-NOV-09 07:00 657) VSAT-Loader 09-NOV-2009 07:00 started

OperationsPlanningEngineer Market Systems Production 09-nov-2009 11:32:31 NZDT



Case Output

Schedule Results : SFTCheck Violations 

Case Control | Constraint Outputs | **SFTCheck Violations**

Tooltray ▾

Schedule Selection

Case Selection

From: 09-nov-2009 00:00

To: 10-nov-2009 00:00

All Cases ▾ Apply

Show: Case Name ▾

Find:

Cases

- RTD
- RTP
- SDPQ
 - Auto SDPQ 09-NOV-09 11:00 779
 - Auto SDPQ 09-NOV-09 10:30 763
 - Auto SDPQ 09-NOV-09 10:00 750
 - Auto SDPQ 09-NOV-09 09:30 732
 - Auto SDPQ 09-NOV-09 09:00 717
 - Auto SDPQ 09-NOV-09 08:30 701
 - Auto SDPQ 09-NOV-09 08:00 687
 - Auto SDPQ 09-NOV-09 07:30 671
 - Auto SDPQ 09-NOV-09 07:00 657
 - Auto SDPQ 09-NOV-09 06:30 633
 - Auto SDPQ 09-NOV-09 06:00 620
 - Auto SDPQ 09-NOV-09 05:30 603
 - Auto SDPQ 09-NOV-09 05:00 590

Market Day

09-nov-2009 ▾

View All Days

Case Detail

Case Id: 81232009111800657

Case Type: SDPQ

Case Owner: William Huggins

Period Start: 09-nov-2009 07:00

Period End: 09-nov-2009 10:30

Case State: Approved

Completed: 09-nov-2009 07:11

SFT: No

SFT Check: Yes

DCSA:

RMT:

Unmanageable Contingencies for case Auto SDPQ 09-NOV-09 07:00 657 from 09-nov-2009 to 09-nov-2009

Constraint Name	Offload Time	TP 15	TP 16	TP 17	TP 18	TP 19	TP 20	TP 21	TP 22
		07:00	07:30	08:00	08:30	09:00	09:30	10:00	10:30
MTIWKM1\$ MTI M Actual				09:44	08:53	11:05			13:39
MTIWKM1\$ MTI M Limit				15:00	15:00	15:00			15:00
MTIWKM2\$ MTI M Actual				09:44	08:53	11:05			13:39
MTIWKM2\$ MTI M Limit				15:00	15:00	15:00			15:00

Unsolved Contingencies for case Auto SDPQ 09-NOV-09 07:00 657 from 09-nov-2009 to 09-nov-2009

Contingency Name	TP 15	TP 16	TP 17	TP 18	TP 19	TP 20	TP 21	TP 22
	07:00	07:30	08:00	08:30	09:00	09:30	10:00	10:30
ADD_ISL4				PartSolved				
ASB_TWZ1				PartSolved				
ASB_TWZ2				PartSolved				
ATI_WKM				PartSolved				
ATU_DOB1	PartSolved	PartSolved	PartSolved	PartSolved	PartSolved		PartSolved	
ATUIGH1*	PartSolved	PartSolved	PartSolved	PartSolved	PartSolved			
BAL_GOR				PartSolved				
BAL_HWB				PartSolved				
BEN_P1@				PartSolved				
BEN_P2@				PartSolved				
BLN_KIK				PartSolved				
BLNSTK1#				PartSolved				
BPE_BRK1				PartSolved				
BPE_BRK2				PartSolved				
BPE_MTR1				PartSolved				
COL_OTI1				PartSolved				
COL_OTI2				PartSolved				
DOB_GYM	PartSolved		PartSolved	PartSolved				
EDG_KAW3				PartSolved				

OperationsPlanningEngineer | Market Systems Production | 09-nov-2009 11:41:31 NZDT

Case Output

Solver Controls : CSV Diff Viewer

Case Control Constraint Outputs SFTCheck Violations **CSV Diff Viewer**

Tooltray ▾ + ×

Compare Cases

Case Selection

From: 09-nov-2009 00:00

To: 10-nov-2009 00:00

All Cases Apply

Show: Case Name

Cases

- [-] SDPQ
 - <copy>Auto SDPQ 09-NOV-09 08:00 687
 - Oper SDPQ 09-NOV-09 14:52 910
 - Auto SDPQ 09-NOV-09 14:30 903
 - Oper SDPQ 09-NOV-09 14:22 891
 - Auto SDPQ 09-NOV-09 14:00 885
 - Oper SDPQ 09-NOV-09 14:00 877
 - Auto SDPQ 09-NOV-09 13:30 860
 - Auto SDPQ 09-NOV-09 13:00 840
 - Auto SDPQ 09-NOV-09 12:30 824
 - Auto SDPQ 09-NOV-09 12:00 809
 - Auto SDPQ 09-NOV-09 11:30 793
 - Auto SDPQ 09-NOV-09 11:00 779
 - Auto SDPQ 09-NOV-09 10:30 763
 - Auto SDPQ 09-NOV-09 10:00 750
 - Auto SDPQ 09-NOV-09 09:30 732
 - Auto SDPQ 09-NOV-09 09:00 717
 - Auto SDPQ 09-NOV-09 08:30 701
 - Auto SDPQ 09-NOV-09 08:00 687
 - Auto SDPQ 09-NOV-09 07:30 671
 - Auto SDPQ 09-NOV-09 07:00 657
 - Auto SDPQ 09-NOV-09 06:30 633
 - Auto SDPQ 09-NOV-09 06:00 620
 - Auto SDPQ 09-NOV-09 05:30 603

Compare Cases:

<copy>Auto SDPQ 09-NOV-09 08:00 687

Compare

CSV File Options

Find Files

Case Files

CSV Diff

<copy>Auto SDPQ 09-NOV-09 08:00 687

Name	Size	Date Modified
MSS_81232009111900913_0X_0_09-NOV-2009_08_00_0.SPDSOLVED	474 KB	09-nov-2009 14:54
MSS_81232009111900913_0X_0_09-NOV-2009_08_00_0.SPDSOLVED.aieperf	2 KB	09-nov-2009 14:54
MSS_81232009111900913_0X_0_09-NOV-2009_08_30_0.SPDSOLVED	477 KB	09-nov-2009 14:55
MSS_81232009111900913_0X_0_09-NOV-2009_08_30_0.SPDSOLVED.aieperf	2 KB	09-nov-2009 14:55
MSS_81232009111900913_0X.aieperf	5 KB	09-nov-2009 14:54
MSS_81232009111900913_0X.DAILY	190 KB	09-nov-2009 14:54
MSS_81232009111900913_0X.MDBCTRL	2 KB	09-nov-2009 14:54
MSS_81232009111900913_0X.MSSMKT	72 KB	09-nov-2009 14:54
MSS_81232009111900913_0X.MSSMOD	238 KB	09-nov-2009 14:54
MSS_81232009111900913_0X.MSSNET	704 KB	09-nov-2009 14:54
MSS_81232009111900913_0X.PERIOD	182 KB	09-nov-2009 14:54
MSS_81232009111900913_0X.SPDITER	35 KB	09-nov-2009 14:54
MSS_81232009111900913_0X_09-NOV-2009_08_00_1_0.MSSSITE	25 KB	09-nov-2009 14:54
MSS_81232009111900913_0X_09-NOV-2009_08_30_1_0.MSSSITE	25 KB	09-nov-2009 14:54
MSS_81232009111900913_0X_09-NOV-2009_08_00_0.MSSSITE	25 KB	09-nov-2009 14:54
MSS_81232009111900913_0X_09-NOV-2009_08_00_0.MSSNET	475 KB	09-nov-2009 14:54
MSS_81232009111900913_0X_09-NOV-2009_08_00_0.SFTCHECK	98 KB	09-nov-2009 14:54
MSS_81232009111900913_0X_09-NOV-2009_08_00_0.SFTCHECK.aieperf	1 KB	09-nov-2009 14:54
MSS_81232009111900913_0X_09-NOV-2009_08_00_0_1.MSSSENS	10 KB	09-nov-2009 14:54
MSS_81232009111900913_0X_09-NOV-2009_08_30_0.MSSSITE	25 KB	09-nov-2009 14:55
MSS_81232009111900913_0X_09-NOV-2009_08_30_0.MSSNET	475 KB	09-nov-2009 14:54
MSS_81232009111900913_0X_09-NOV-2009_08_30_0.SFTCHECK	121 KB	09-nov-2009 14:55
MSS_81232009111900913_0X_09-NOV-2009_08_30_0.SFTCHECK.aieperf	1 KB	09-nov-2009 14:55
MSS_81232009111900913_0X_09-NOV-2009_08_30_0.SPDSOLVEDIMM	38 KB	09-nov-2009 14:54
MSS_81232009111900913_0X_09-NOV-2009_08_30_0_1.MSSSENS	10 KB	09-nov-2009 14:55

25 Files \\wmms-fs1\mssollexport

Ready OperationsPlanningEngineer Market Systems Production 09-nov-2009 14:58:35 NZDT



Case Output

Solver Controls : CSV Diff Viewer

Case Control | Constraint Outputs | SFTCheck Violations | **CSV Diff Viewer**

Tooltray

Compare Cases

Case Selection

From: 09-nov-2009 00:00

To: 10-nov-2009 00:00

All Cases [Apply]

Show: Case Name

Cases

- SDPQ
 - <copy>Auto SDPQ 09-NOV-09 08:00
 - Oper SDPQ 09-NOV-09 14:52 910
 - Auto SDPQ 09-NOV-09 14:30 903
 - Oper SDPQ 09-NOV-09 14:22 891
 - Auto SDPQ 09-NOV-09 14:00 885
 - Oper SDPQ 09-NOV-09 14:00 877
 - Auto SDPQ 09-NOV-09 13:30 860
 - Auto SDPQ 09-NOV-09 13:00 840
 - Auto SDPQ 09-NOV-09 12:30 824
 - Auto SDPQ 09-NOV-09 12:00 809
 - Auto SDPQ 09-NOV-09 11:30 793
 - Auto SDPQ 09-NOV-09 11:00 779
 - Auto SDPQ 09-NOV-09 10:30 763
 - Auto SDPQ 09-NOV-09 10:00 750
 - Auto SDPQ 09-NOV-09 09:30 732
 - Auto SDPQ 09-NOV-09 09:00 717
 - Auto SDPQ 09-NOV-09 08:30 701
 - Auto SDPQ 09-NOV-09 08:00 687
 - Auto SDPQ 09-NOV-09 07:30 671
 - Auto SDPQ 09-NOV-09 07:00 657
 - Auto SDPQ 09-NOV-09 06:30 633
 - Auto SDPQ 09-NOV-09 06:00 620
 - Auto SDPQ 09-NOV-09 05:30 603

Compare Cases:

<copy>Auto SDPQ 09-NOV-09 08:00 68

[Compare]

CSV File Options

Find Files

Case Files

09-NOV-2009_08_00_0_1.MSSENS

CSV File Viewer

Table Name	Rows
CONSTRAINT	9
BRANCHSENS	9
UNSOLVEDCTG	4
VOLTAGEIDL	37
POWERBALANCE	1

Visible Columns:

- Line
- ID_ITERATION
- ID_CONSTRAINT
- CTG_CONSTRAINT

File Name: MSS_81232009111900913_0X_09-NOV-2009_08_00_0_1.MSSENS

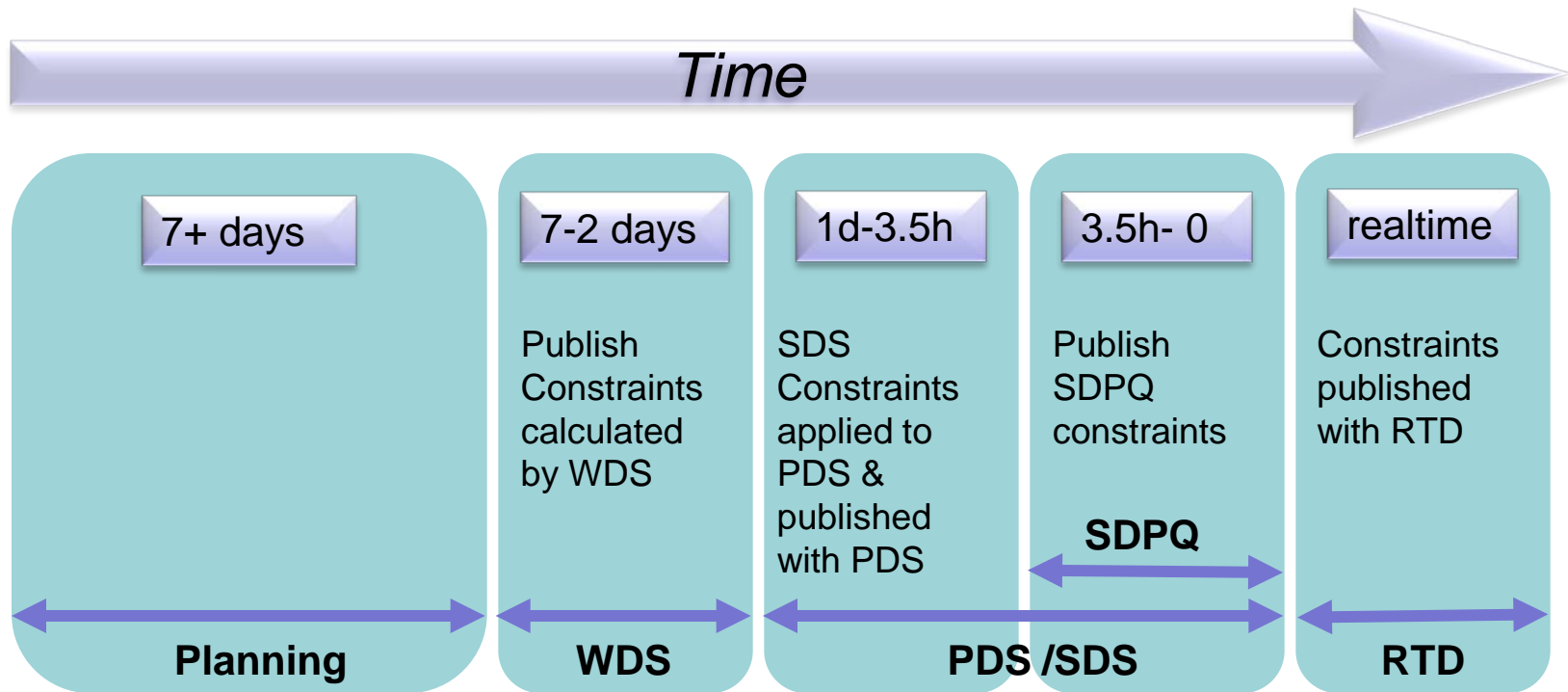
CONSTRAINT

9 Rows

ID_ITERATION	ID_CONSTRAINT	CTG_CONSTRAINT	ID_CONTINGENCY	ID_EQUIPMENT	INTERFACE_CONSTRAINT	OPERATION
1	MTI_WKM2.1__MTI_WKM1.1__MTIWKM1\$__MTI_LN		1	MTIWKM1\$	MTI MTI_WKM2	1 0 <=
1	MTI_WKM1.1__MTI_WKM2.1__MTIWKM2\$__MTI_LN		1	MTIWKM2\$	MTI MTI_WKM1	1 0 <=
1	COB_STK2.2__COB_UTK1.1__COBUTK1*__COB_LN		1	COBUTK1*	COB COB_STK2	2 0 <=
1	HKK_KUM1.1__HKK_OTI2.1__HKK_OTI2__KUM_LN		1	HKK_OTI2	HKK HKK_KUM1	1 0 <=
1	KUM_OTI.1__HKK_OTI2.1__HKK_OTI2__OTI_LN		1	HKK_OTI2	KUM KUM_OTI	1 0 <=
1	KUM_OTI.1__HKK_OTI2.1__S__HKK_OTI2__OTI_LN		1	HKK_OTI2	KUM KUM_OTI	1 0 <=
1	HKK_OTI2.1__HKK_KUM1.1__HKK_KUM1__OTI_LN		1	HKK_KUM1	HKK HKK_OTI2	1 0 <=
1	TIM_T2__110KV__ASB_TIM_TWZ1.3__ASB_TWZ1__XF		1	ASB_TWZ1	TIM T2 T2	0 <=
1	TIM_T2__110KV__ASB_TIM_TWZ2.3__ASB_TWZ2__XF		1	ASB_TWZ2	TIM T2 T2	0 <=

Ready OperationsPlanningEngineer Market Systems Production 09-nov-2009 14:59:58 NZDT

Schedule Types



Constraint Publication

Schedule	Description	Timing	Constraint 1	
			Name	%
WDS	will be run every day at 1:30am. T1 of the next day for a full 6 days.	Day 7	1.34*TKU_WKM1.1+ 0.32*TKU_WKM2.1 <120	90
		Day 6...	1.36*TKU_WKM1.1+ 0.31*TKU_WKM2.1 <119	88
		...Day 2	1.34*TKU_WKM1.1+ 0.32*TKU_WKM2.1 <120	85
SDS	Constraints that are within a fixed percentage of binding in the SDS schedules will be published (proposed to be 85%).	1pm day before	1.38*TKU_WKM1.1+ 0.29*TKU_WKM2.1 <117	85
		3pm day before	1.36*TKU_WKM1.1+ 0.31*TKU_WKM2.1 <119	84
		1/2 hour before constraint is required	1.34*TKU_WKM1.1+ 0.32*TKU_WKM2.1 <120	82
PDS	The constraints calculated by the SDS schedule are applied to the PDS schedule.	Same as SDS	1.38*TKU_WKM1.1+ 0.29*TKU_WKM2.1 <117	81



Constraint Publication

Schedule	Description	Timing	Constraint 1	
			Name	%
SDPQ	The System Operator will publish (in COMIT) a list of security constraints that are within a fixed percentage of binding in the SDPQ schedules.	3 hours in advance	Will be the same as the SDS results	83
		2 1/2 hours in advance		82
		1/2 hour before constraint is required in real time	RTD and Pricing use these constraints	82
RTD	Uses the constraints calculated from the last applicable SDPQ schedule. If constraints are modified after the last applicable SDPQ schedule then changes will be published with the RTD schedule.		1.34*TKU_WKM1.1+ 0.32*TKU_WKM2.1 <129 RHS Changes normally or Ad hoc updates for major events	94



Questions?



Implementation Plan

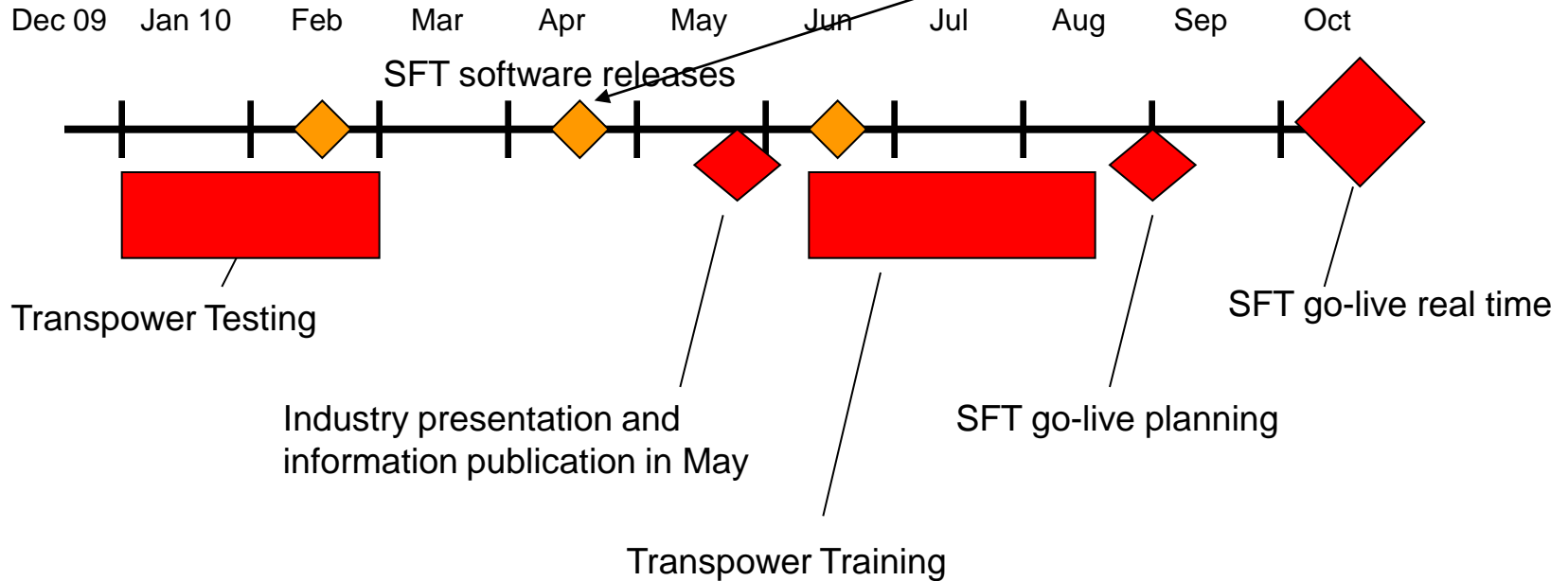
Objective

- Determine how should we turn SFT on given practical “constraints”
- Have agreed straw man implementation plan/schedule
- Document any minutes, actions for tracking and follow up



Draft Schedule

1. DC/AC solve
2. Temp attributes
3. Name of constraint



Should have sufficient time to include industry trials, parallel operation etc

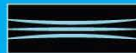
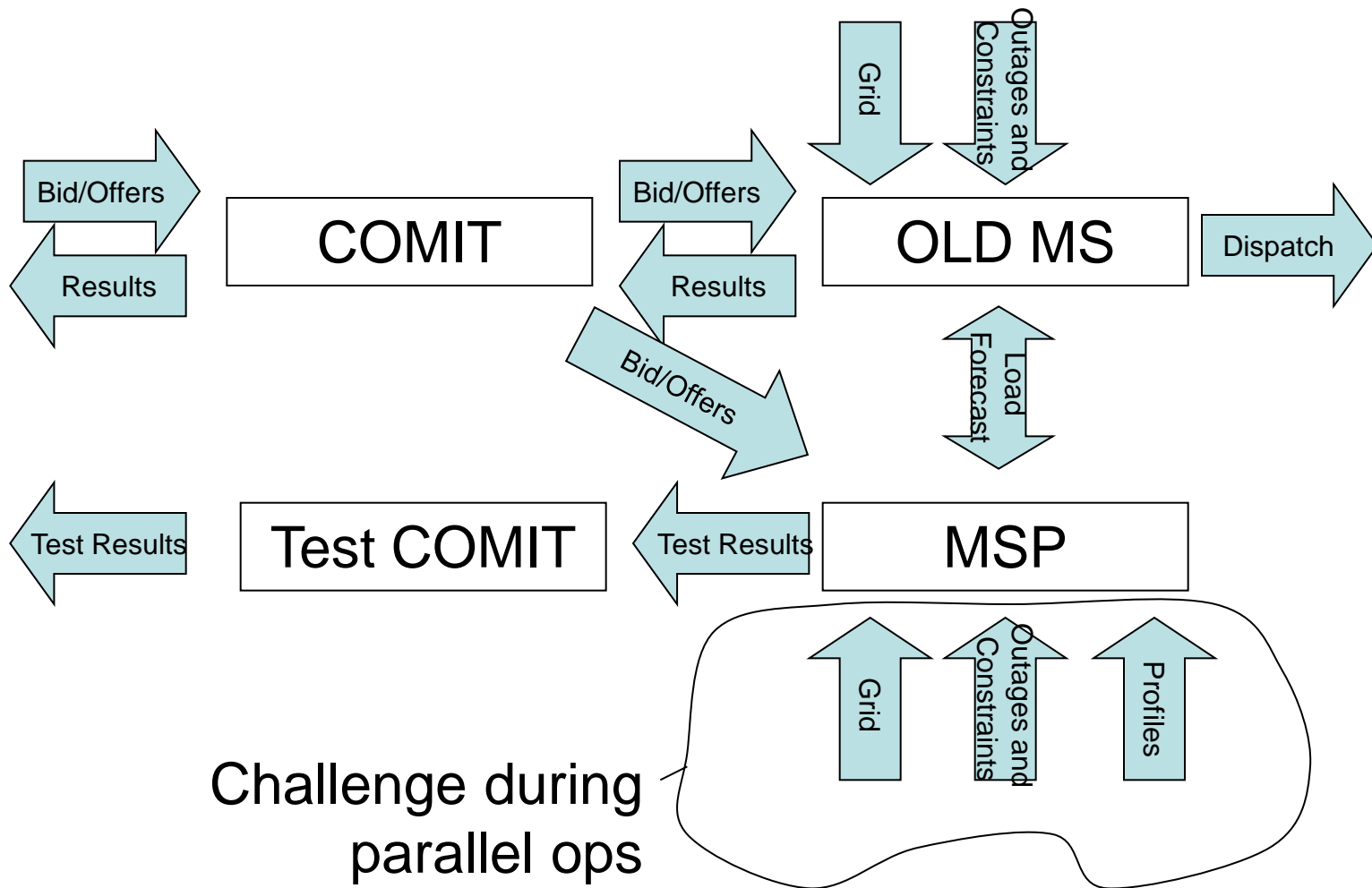


Environments

- Production System
 - Pre Production System
 - Integration Test
 - Training x 3
 - Separate Development
- *For MSP - connected MSP Production up to NZX test system for a period of parallel operations*



MSP (main parallel operation approach)

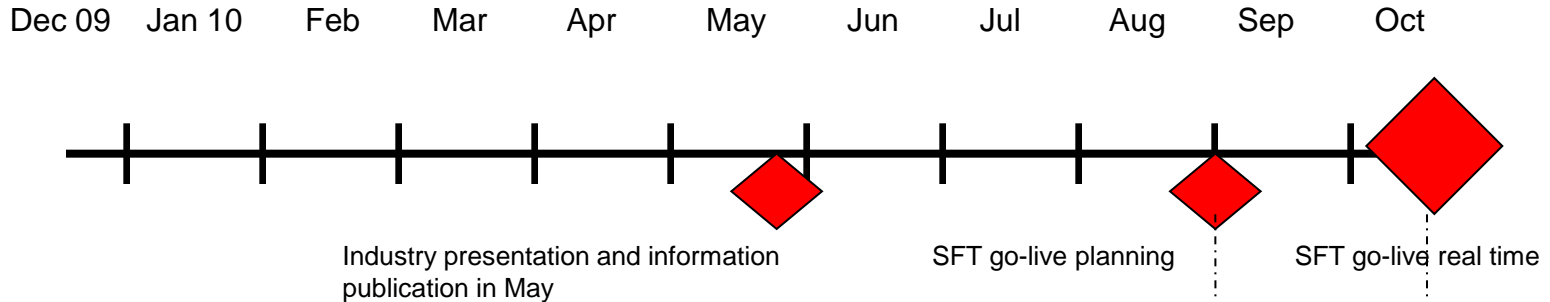


Options

1. Set up system like MSP trials (participants see full parallel outputs from COMIT test system)
2. Train participants on training simulator
3. Provide “play pen” (with portal) – technology and security questions
4. Similar to 1) but with some predetermined SO actions (eg agreed outages entered to create specific constraints)
5. Others?



Straw man option

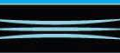


Connect Environment xyz to NZX test system



Last 3 days – 24/7 parallel operations published to NZX test system prior to cut over

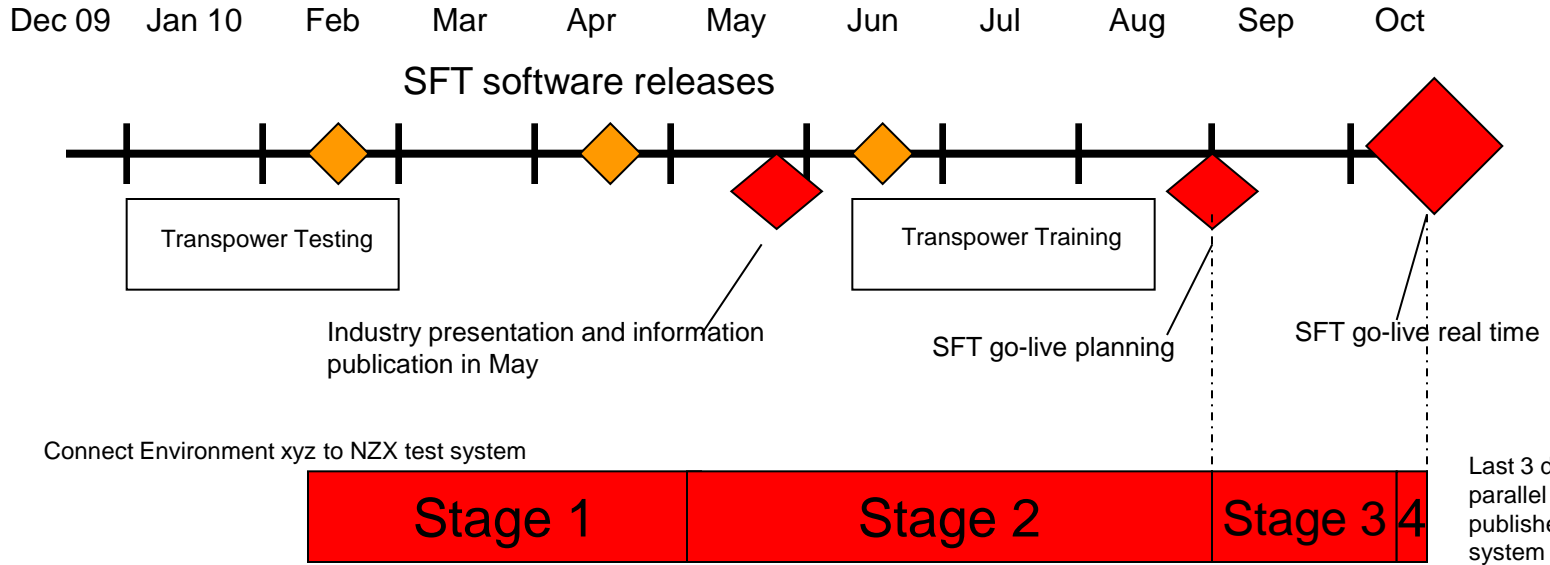
Stage	1) Industry learning	2) Targeted scenarios at agreed times	3) Pre go live
Transpower “watering”	Automatic	Operator enter scenarios ????	8/5 parallel ops
Offers	Production	Production with overrides / scenarios	Production
Load Forecast	Production load forecast / bids	Production load forecast / bids	Production load forecast / bids
Outages and manual constraints	In synch 2 hours per day? Or automate???	In synch 2 hours per day? Or automate??? Make predetermined changes ???	In synch 8/5
Constraints	SFT in go live status (SDPQ, SDS, WDS)		
Grid	Production		



- Questions
- Recap actions
- Next steps



Plan



Stage	1) Industry learning	2) Targeted scenarios at agreed times	3) Pre go live
Transpower "watering"	Automatic	Operator enter scenarios - communicates	8/5 parallel ops
Offers	Production	Production with overrides / scenarios	Production
Load Forecast	Production load forecast / bids	Production load forecast / bids	Production load forecast / bids
Outages and manual constraints	In synch 2 hours per day? Or automate???	In synch 2 hours per day? Or automate??? Make predetermined changes	In synch 8/5
Constraints	SFT in go live status (SDPQ, SDS, WDS)		
Grid	Production		

