

DOAG Community Event

OMV Capital Project Risk Management

Vienna, 21 May 2014

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OMV Aktiengesellschaft

Agenda

Objectives

- ▶ Which are OMV's project characteristics?
- ▶ Why was quantitative schedule risk assessment (SRA) introduced?
- ▶ What are the main preconditions/ requirements for performing the SRA?
- ▶ Are there any benefits by taking the effort of an SRA – does it pay off?

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Introduction

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OMV – an integrated oil & gas company

Upstream

Downstream

Exploration and Production

- ▶ Worldwide activities, mature core countries: Romania and Austria
- ▶ Approximately 80% of production in EU and OECD countries
- ▶ Production: 288 kboe/d
- ▶ Reserves:
1.13 bn boe 1P
1.92 bn boe 2P
- ▶ Project pipeline: >1 bn boe



Gas and Power

- ▶ Gas sales business in CEE, SEE and Turkey
- ▶ Gas-fired power plants in Romania and Turkey

Refining and Marketing

- ▶ 3 refineries with capacity of 17.4 mn t¹
- ▶ ~4,200 filling stations in 11 countries

Figures from 2013

OMV –project portfolio (20mio – >10bn €)

Exploration & Production



Gas & Power



Refining & Marketing



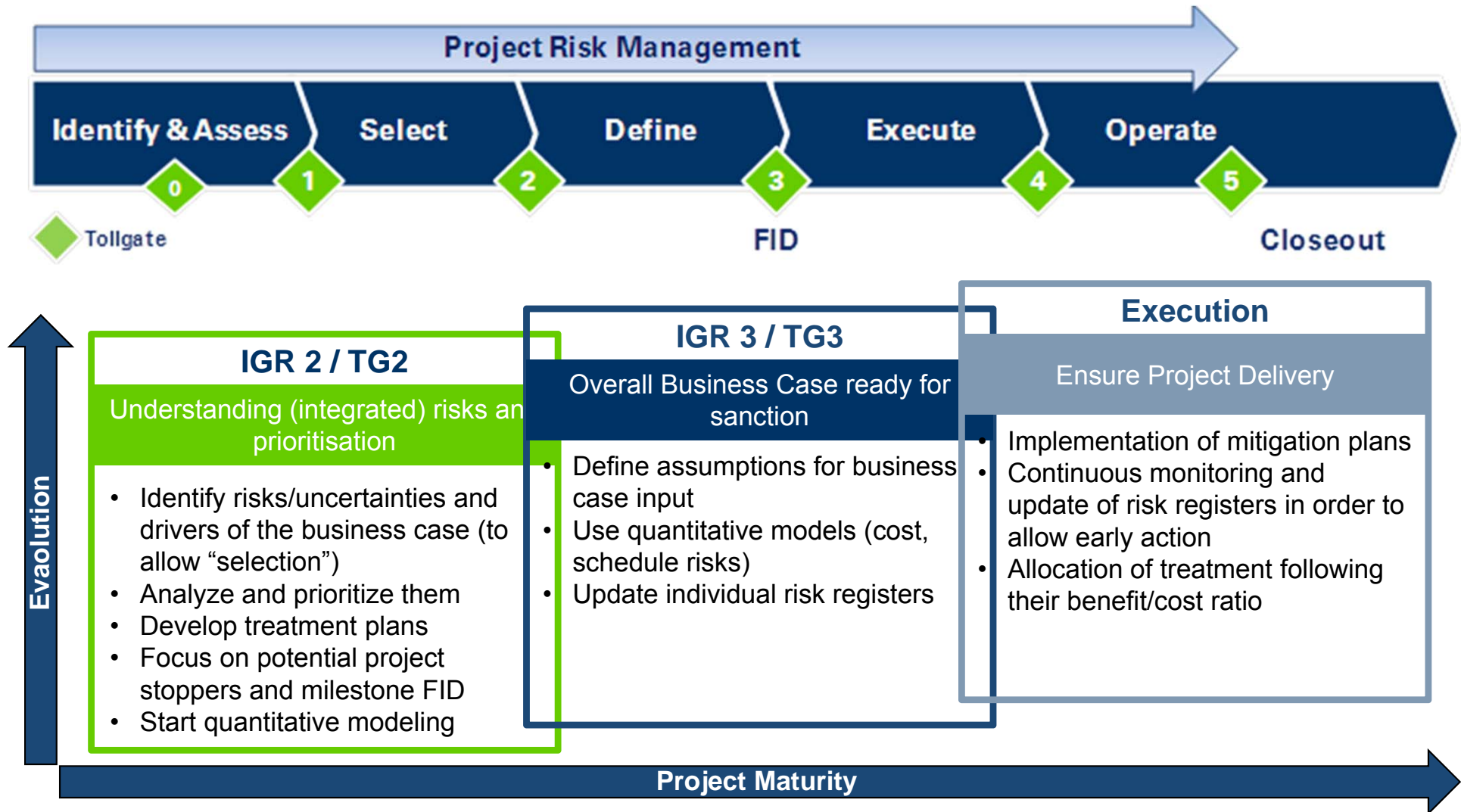
From Norway to New Zealand



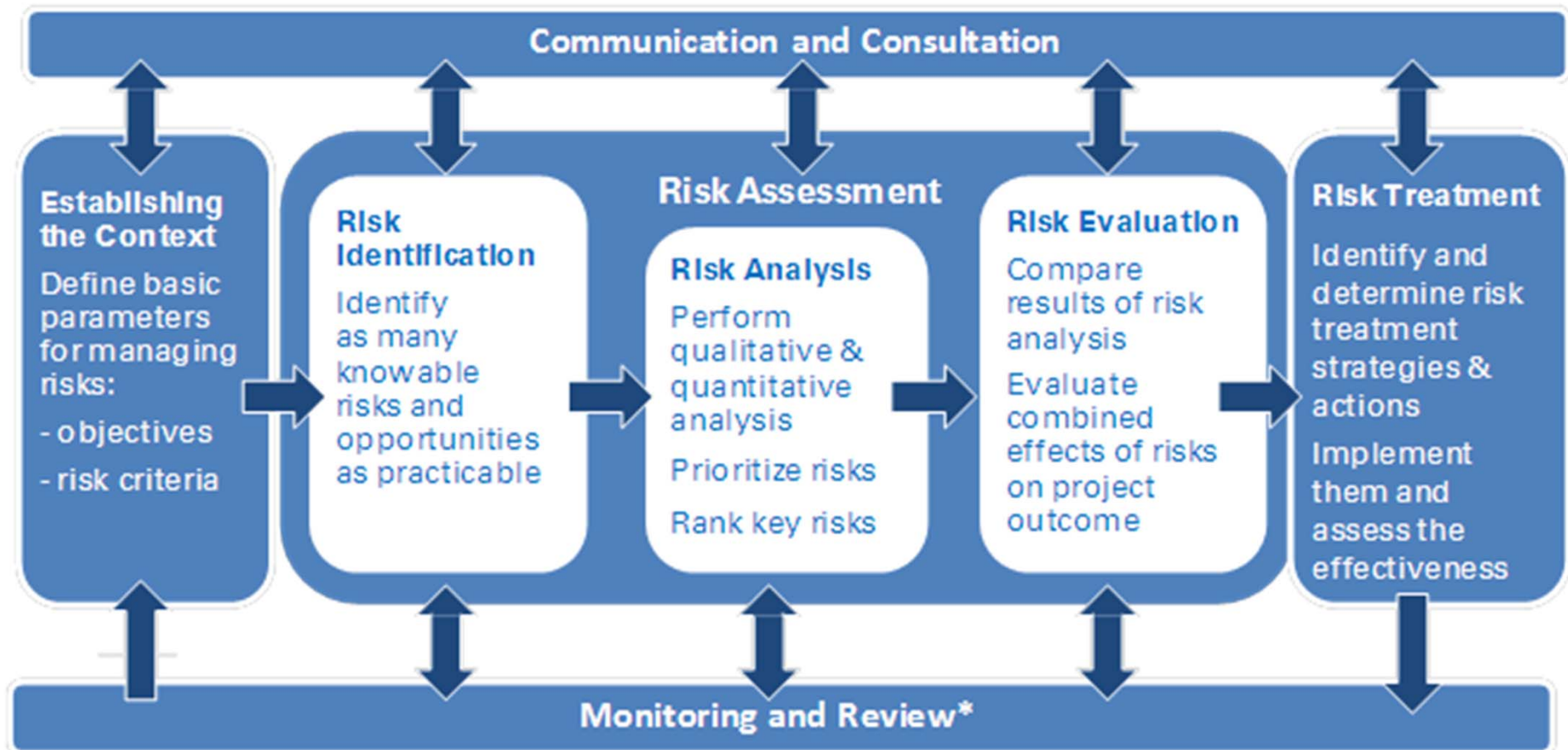
Project Risk Management

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Project phases & risk management maturation



Risk management process (ref. ISO 31000)



* Including Project Close-Out & Lessons Learned

Semi-quantitative risk assessment

- ▶ Differentiate between risks (threats, opportunities) and uncertainties; definition of risk dimensions (cost, schedule, reservoir, production, legal, political, etc.) and thresholds
- ▶ Description and evaluation (quantification: likelihood of occurrence and impact) of risks; produce heat map for risk management; mitigation planning

Significant: Readiness Corner

Risk-reducing actions should be considered. Actions typically consist of establishing and exercising emergency-plans / business continuity plan

Critical

Risk-reducing actions shall be implemented. These risks normally require immediate attention.

Significant

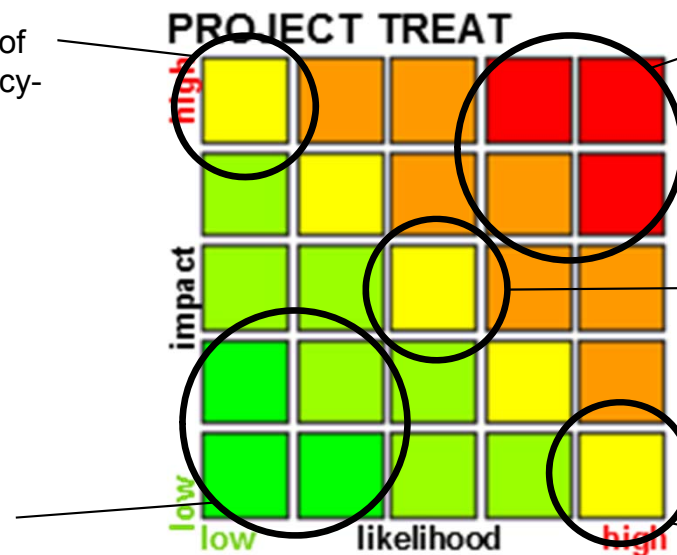
Risk-reducing actions should be considered. Risks should, as a minimum, be monitored.

Negligible

Risk-reducing actions are not necessary and should no be implemented unless cost-efficient.

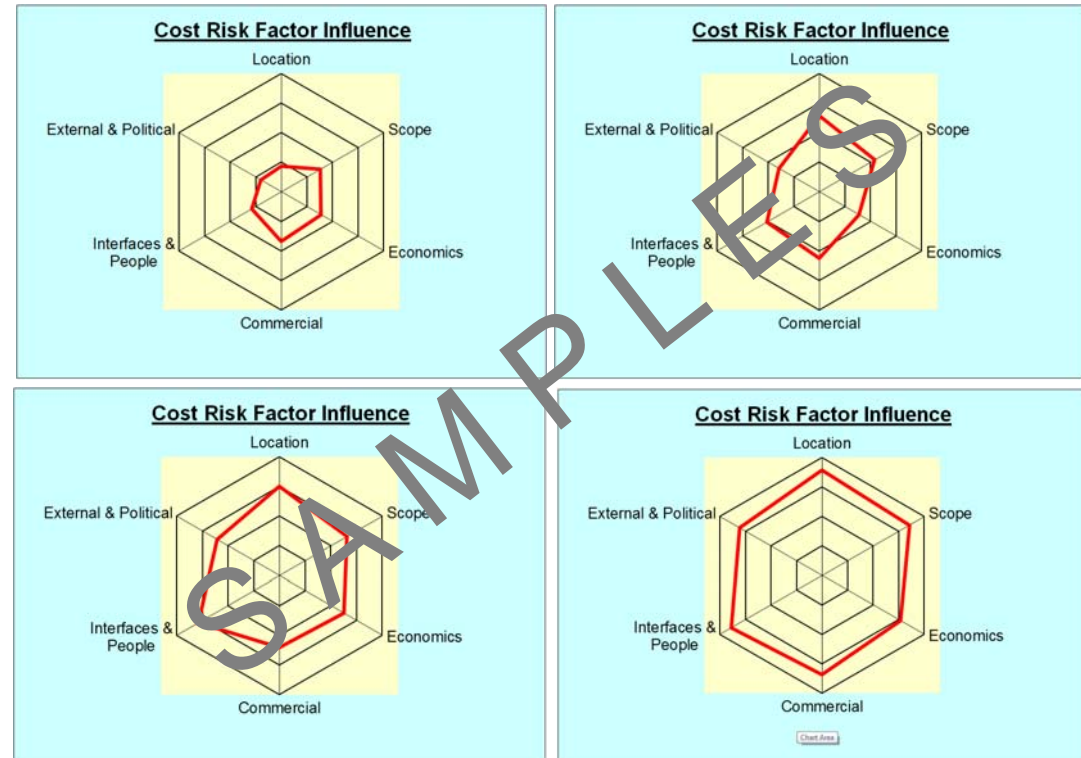
Significant: Cost/benefit Corner

Risk-reducing actions are considered based on cost/benefit.



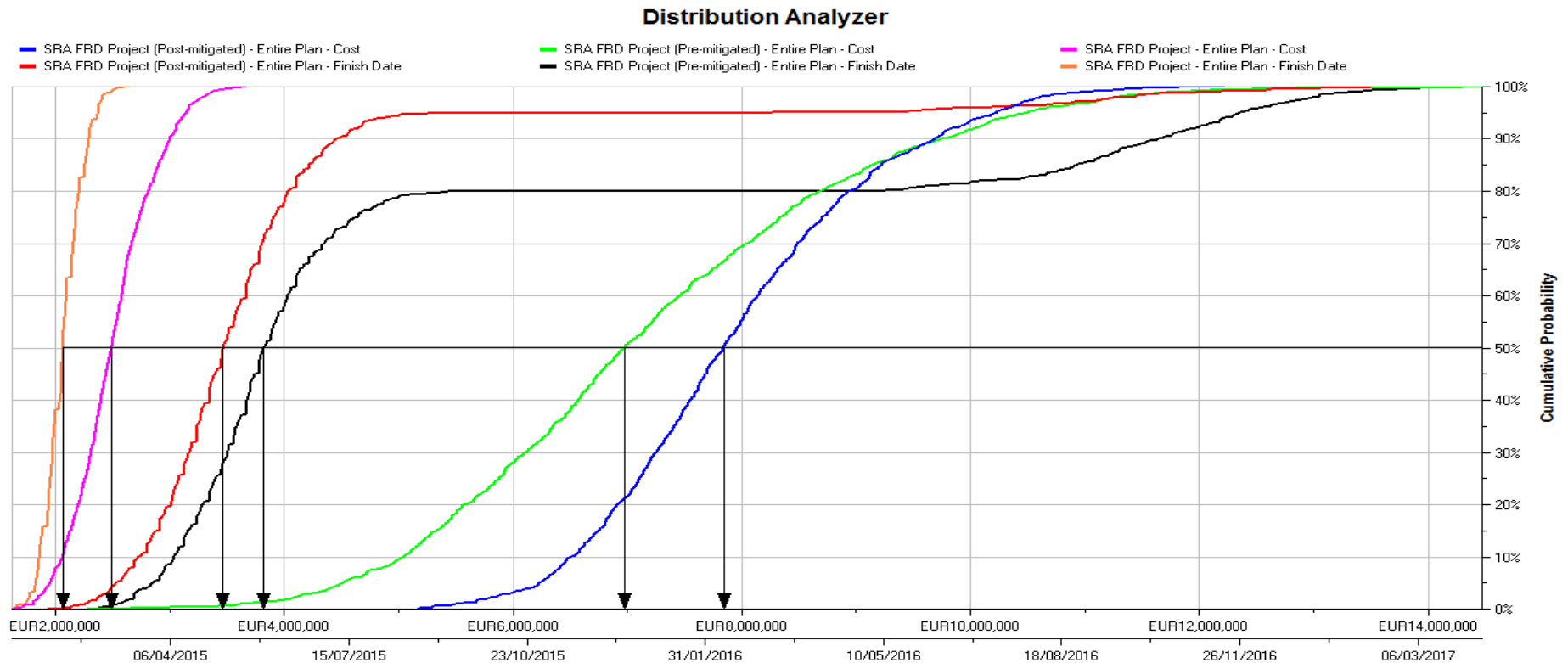
Deterministic/systemic risk analysis

- ▶ Standardized tool for systemic risk assessment (provided by external consultant) – quick application with 6 risk dimensions, detailed description of risk criteria
- ▶ Basis for quantitative cost risk assessment (5A, 5, 4 class cost estimates)
- ▶ Risk profiles can be used as selection criteria during Select phase
- ▶ Verification of probabilistic/stochastic schedule and cost risk assessments (profile, quantitative results)



Probabilistic schedule and cost risk analysis

- ▶ Probabilistic/stochastic SRA and CRA used to calculate time and cost contingency
- ▶ Ranking of the time/cost risks (schedule/cost sensitivity index)
- ▶ Regular updates of SRA and CRA provide early warning indication

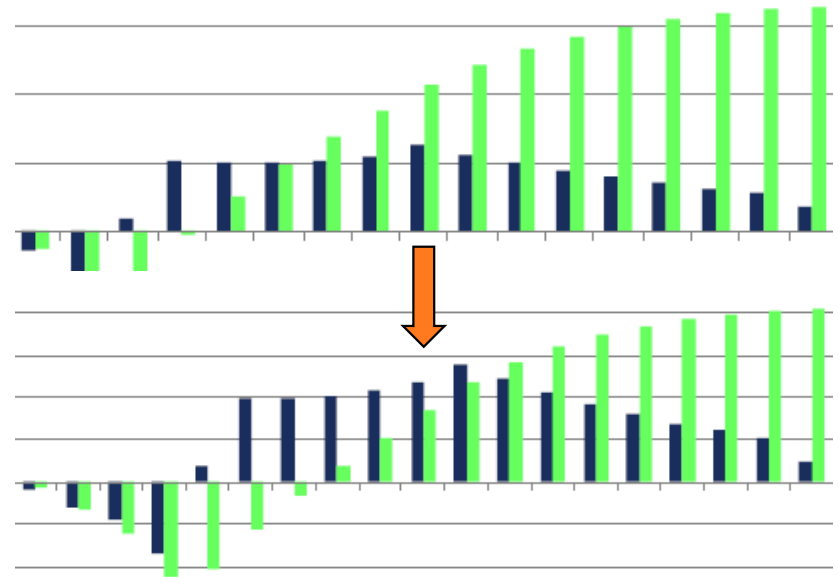


Quantitative Schedule Risk Assessment

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Why was probabilistic SRA introduced?

- ▶ Projects were not delivered on time
 - ▶ OMV (owner/operator) relied on contractors' promises (not sufficient time contingency)
 - ▶ Execution duration has a significant effect on the business case of projects
 - ▶ Production targets were not met
- ▶ Forecasts were not reliable
 - ▶ No early anticipation of potential delays
 - ▶ Due to missing early warnings possible counter measures could not be introduced
- ▶ Methodology for
 - ▶ proper contingency setting (accounted for in the business case)
 - ▶ early warning indication for potential delays



Preconditions for a probabilistic SRA

- ▶ Corporate risk culture
 - ▶ Qualitative/semi-quantitative risk management exists (time, resources) (basis for modeling of schedule risks)
 - ▶ Schedule contingency management is understood
 - ▶ Benchmarking (e.g., IPA, Functional Forum)
- ▶ Project schedule (owner schedule)
 - ▶ Critical path schedule (200 – 800 activities)
 - ▶ The schedules need to have an adequate network quality (fully linked, etc.)
- ▶ Active project control – early warning indication highlights delay risks
 - ▶ to identify the ultimate causes for potential delays
 - ▶ to develop and evaluate recovery/acceleration measures
 - ▶ to implement necessary measures as early as possible

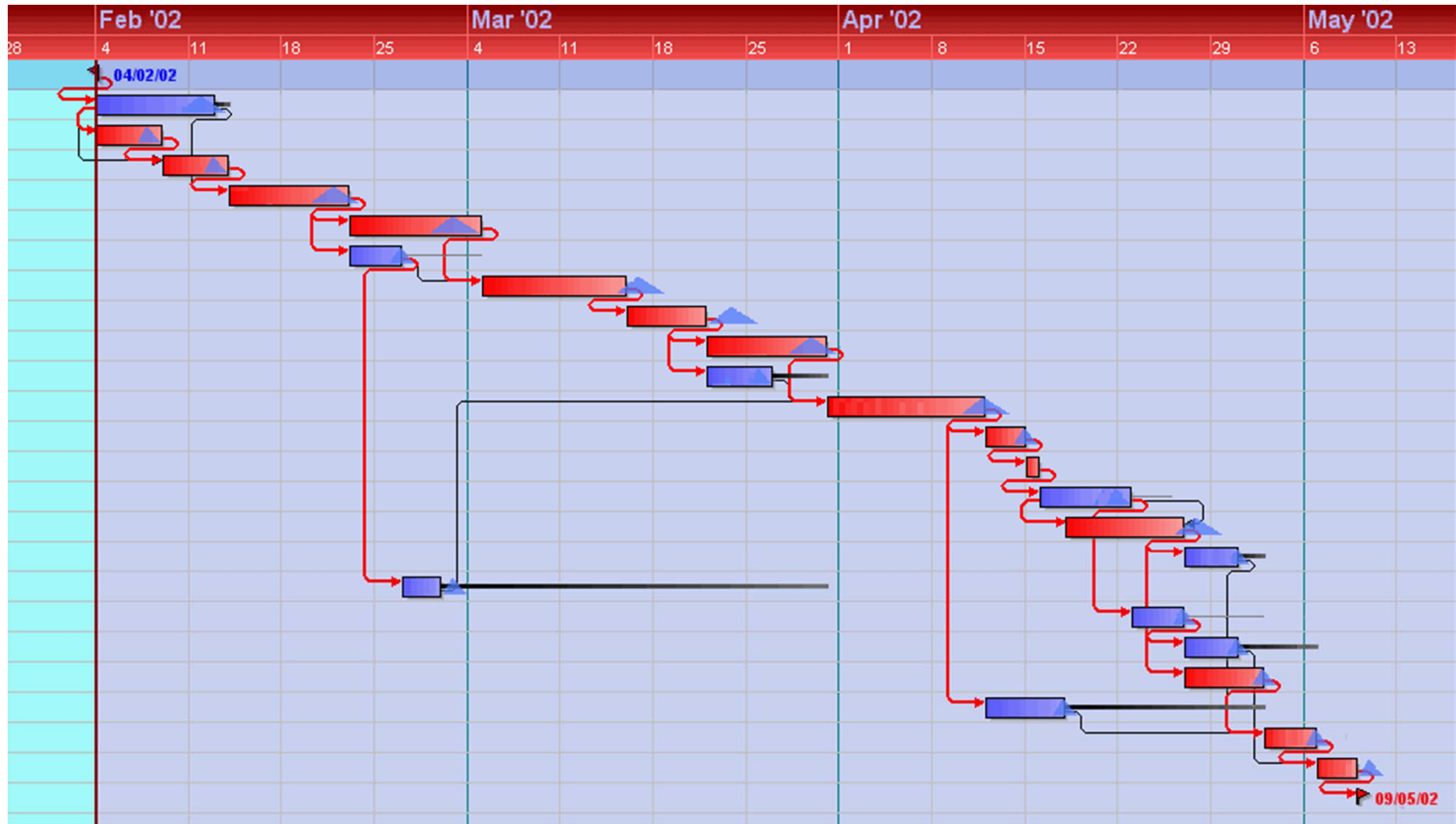
What answers does the SRA give?

- ▶ What is the chance of completing the project on the finish date of the deterministic schedule?
- ▶ What chance do we have to finish the project on a specific date?
- ▶ What date can the project team be 10%, 50% and 90% confident of finishing by?
- ▶ What tasks (risks, uncertainties) are most likely to cause project delay?

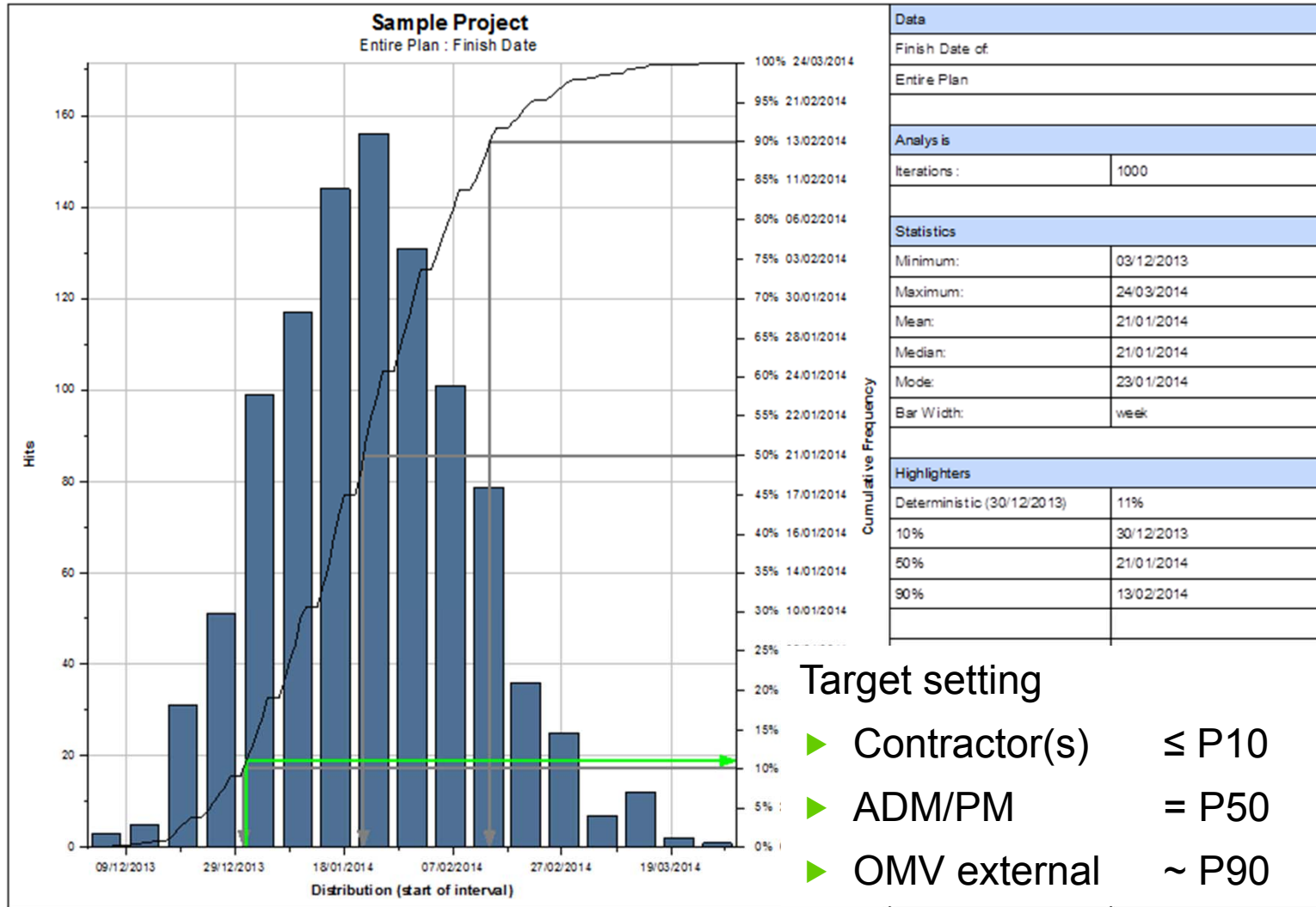
SRA – modeling (Primavera P6)

Activity ID	Activity Name	Start	Finish	Remaining Duration	Free Float	% Calendar	Minimum Duration	Likely Duration	Maximum Duration	Task Existence	Duration Function	Probabilistic Branching	Duration Correlation
1	Major Project Milestones and Decisions	25-Oct-11 A	26-Feb-18	1594d	0d		360	1440	2880	105.00			
MS-I&A0-02	Internal re-commencement kick-off		25-Oct-11 A	0d		100% 7d/w							
MS-SEL0-10	OE go decision for re-tendering (by SC)		22-Aug-12 A	0d		100% 7d/w							
MS-SEL0-90	IGR 2 (project charter for DEFINE signed)		17-Oct-13	0d	30d	0% 7d/w							
MS-SEL0-90R	IGR 2 delayed (due to internal decisions, business case)	17-Oct-13	17-Oct-13	0d	0d	0% 7d/w	120	360	720	50.00			
MS-PER0-10	Infrastructure permits (NGPL, EOHL, CWPL) received		07-Jan-14	0d	300d	0% 7d/w							
MS-PER0-20	CCPP permit for changed design received		17-May-14	0d	170d	0% 7d/w							
MS-DEF0-50	CCPP PreID (pre-engineering, reservation fee agreement for LLIs)		18-Dec-14	0d	41d	0% 7d/w							
MS-DEF0-50R	CCPP PreID delayed (due to internal decisions)	18-Dec-14	18-Dec-14	0d	0d	0% 7d/w	120	360	720	10.00			
MS-DEF0-90	IGR 3 = CCPP FID (project charter for EXECUTE signed)		11-Sep-15	0d	0d	0% 7d/w							
MS-DEF0-90R1	IGR 3 = CCPP FID delayed (due to internal decisions)	11-Sep-15	11-Sep-15	0d	0d	0% 7d/w	120	360	720	5.00			
MS-DEF0-90R2	IGR 3 = CCPP FID delayed as permit Simbach - St. Peter/Isar pending	11-Sep-15	11-Sep-15	0d	0d	0% 7d/w	0	360	720	40.00			
MS-EXE0-85	CCPP COD		26-Feb-18	0d	0d	0% 7d/w							
2	Project Assurance	02-Sep-13	10-Sep-15	506d	0d		81	132	178	0.00			
PA-SEL0-14	IGR 2 peer review process	02-Sep-13	16-Oct-13	33d	0d	0% 5d/w 2w	15	33	44				
PA-SEL0-24	IGR 3' review process for PreID	03-Nov-14	17-Dec-14	33d	0d	0% 5d/w 2w	22	33	44				
PA-DEF0-14	IGR 3 peer review process (incl. all relevant decisions)	11-Jun-15	10-Sep-15	86d	0d	0% 5d/w 2w	44	66	88				
3	Project Management			0d	0d		0	0	0	0.00			
4	Power Economics - Business Case	03-Sep-12 A	10-May-13	130d	0d		90	125	155	0.00			
PE-BC-0-32	CCPP investigate gas storage supply options	03-Sep-12 A	29-Mar-13	100d	0d	5% 5d/w 2w	80	100	120				
PE-BC-0-22	CCPP evaluation of various plant type options for OE re-tendering	08-Oct-12 A	16-Nov-12	15d	0d	65% 5d/w 2w	5	15	20				
PE-BC-0-24	CCPP verification of plant type (H-type CCPP)	19-Nov-12	30-Nov-12	10d	4d	0% 5d/w 2w	5	10	15				
PE-BC-0-42	CCPP decide on techno-economical solution for supply from storage(s)	01-Apr-13	10-May-13	30d	0d	0% 5d/w 2w							
5	OE Services	12-Sep-12 A	30-Aug-13	195d	0d		107	155	238	0.00			
OE-CON3-10	OE services prepare tender documents (part 1)	12-Sep-12 A	05-Oct-12 A	0d		100% 5d/w 2w							
OE-CON3-20	OE services prepare tender documents (part 2)	19-Nov-12	06-Dec-12	14d	0d	0% 5d/w 2w	5	14	19				
OE-CON3-30	OE services bid preparation by contractors	07-Dec-12	31-Jan-13	30d	0d	0% 5d/w 2w	25	30	35				
OE-CON3-40	OE services evaluation of bids & bid negotiations	01-Feb-13	19-Apr-13	56d	0d	0% 5d/w 2w	40	56	110				
OE-CON3-70	OE services evaluation contract awarded & effective		19-Apr-13	0d	0d	0% 5d/w 2w							
OE-SER2-10	OE mobilization period	22-Apr-13	21-May-13	22d	0d	0% 5d/w 2w	15	22	30				
OE-SER2-20	OE prepare deliverables for IGR 2 (I&A, SELECT)	17-Jul-13	30-Aug-13	33d	0d	0% 5d/w 2w	22	33	44				

SRA - Monte Carlo simulation (Primavera Risk Manager)



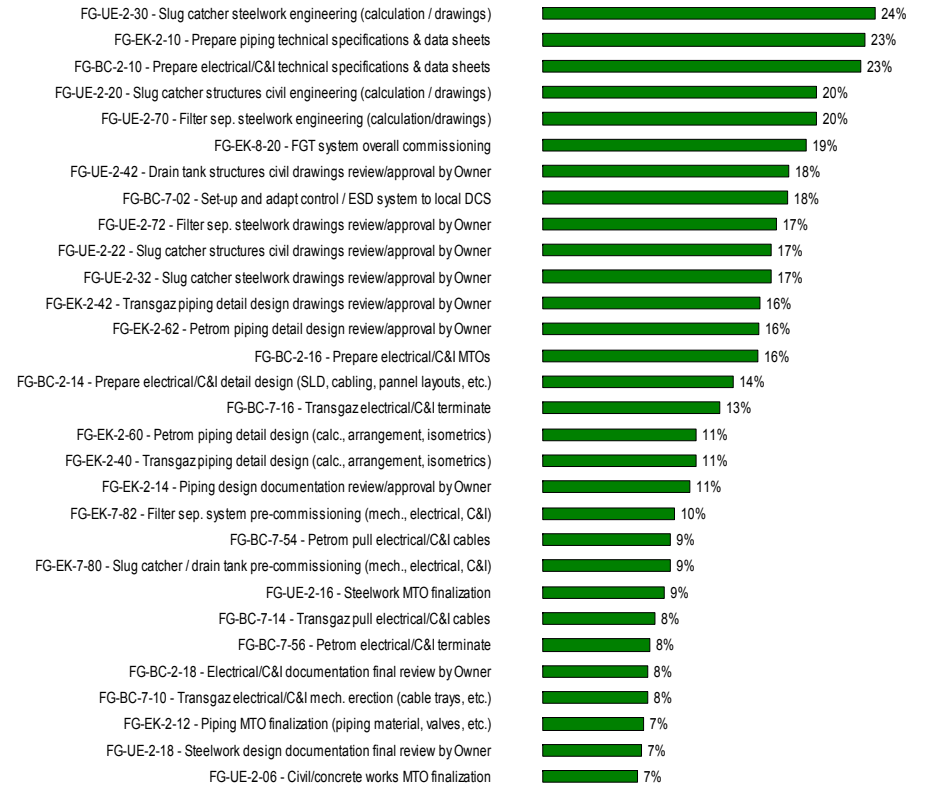
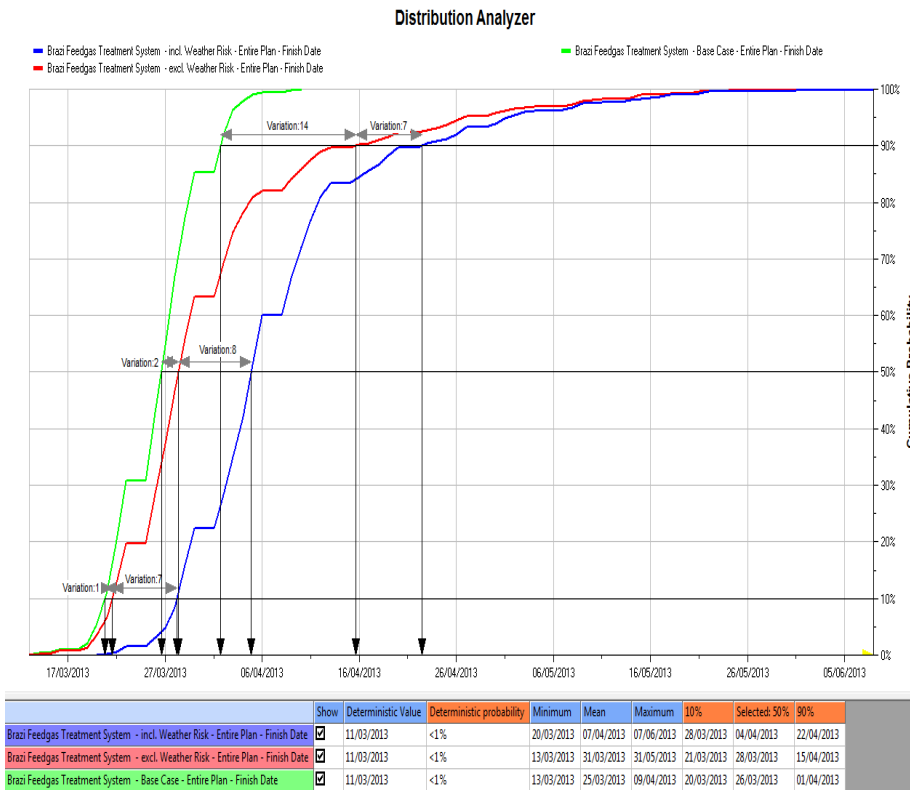
SRA result



Distribution analyzer and schedule sensitivity index (SSI)

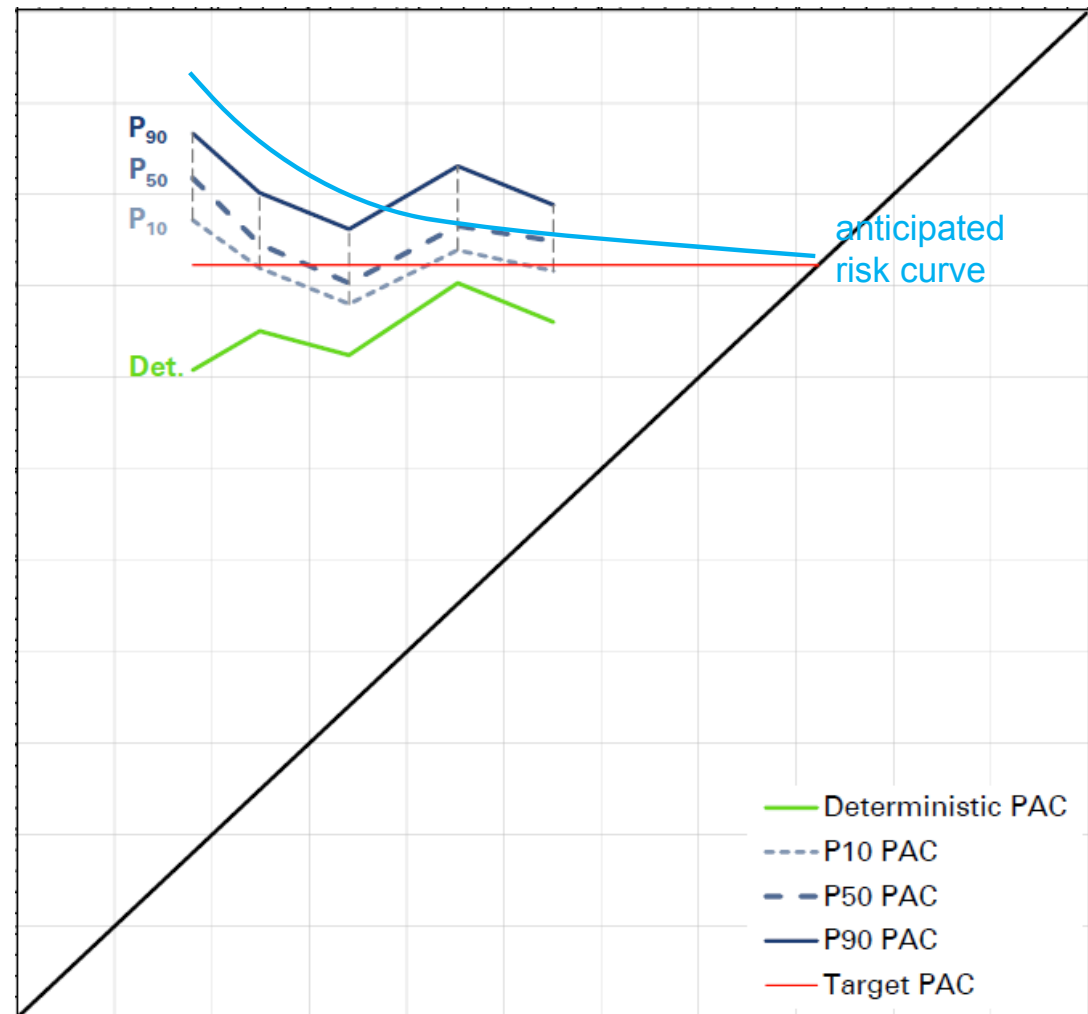
- ▶ Uncertainties only
- ▶ Pre-mitigated risk scenario
- ▶ Post-mitigated risk scenario

- ▶ SSI: measure for the likelihood of an activity delaying the project finish date (or any other date)



Regular Performance of the SRA

- ▶ Depending on the project driver (cost-driven, schedule-driven) the SRA to be regularly repeated (monthly, quarterly)
- ▶ Risk data can be updated together with the deterministic schedule – SRA is a regular schedule review
- ▶ Introduce dates into a milestone trend analysis chart
- ▶ Early warning rules to be set-up - mitigation measures to be defined and implemented



Conclusions

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Summary

- ▶ Challenges when introducing the SRA
 - ▶ Education project owners, ADMs, PMs and project teams
 - ▶ Allocating time and resources for risk workshops
 - ▶ Reaching the required schedule quality (network, sequences, resource-loading)
 - ▶ Maintaining a standard quality level in the project where SRA is introduced
- ▶ The introduction and application of the SRA resulted in
 - ▶ Greater risk management awareness of project teams
 - ▶ Project specific calculation of time contingencies (P50 defined in standard)
 - ▶ Greater transparency and understanding of causes and effects
 - ▶ Schedule-driven projects are provided with a early warning indication
 - ▶ Higher success rate in achieving the targeted completion dates (projects with SRA)

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