

# Aibel – Use of Safran Project

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Safran Forum Stavanger

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aibel

# About Aibel

- Aibel is a leading EPC\* turnkey provider of offshore production platforms to the upstream Oil & Gas and Offshore Wind industry
  - 4,000 employees
  - Annual turnover of NOK 10 billion
  - Average ~10% export last five years
- Frame agreements for maintenance, upgrades and modifications of oil & gas infrastructure
  - Presence on 20 offshore installations and five onshore terminals in Norway
  - Recent deliveries to the European Offshore Wind industry
  - Privately owned, majority owner is Norwegian FERD

\* EPC: Engineering, Procurement, Construction



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# Aibel's locations



# Presence on Norwegian Continental Shelf

## CURRENT PRESENCE NORWAY

- Office locations
- Offshore installations
- Onshore facilities



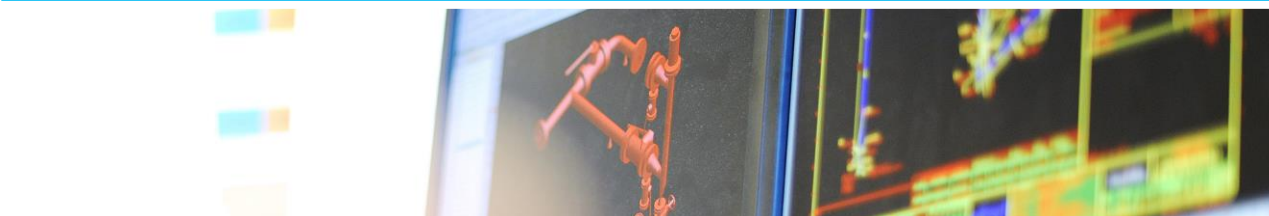
# Ongoing projects

## MODIFICATIONS & YARD SERVICES



- Equinor MMO – onshore and offshore: **Equinor**
- Johan Sverdrup DP hook-up: **Equinor**
- Troll C Gas Module EPCI: **Equinor**
- Snorre Expansion EPCIC: **Equinor**
- Njord Bravo: **Equinor**
- MMO for Alvheim and Ivar Aasen: **AkerBP**
- Gudrun Phase 2 Water Injection EPCI: **Equinor**
- MMO frame agreement: **Wintershall Norge**
- European Capital Projects: **ConocoPhillips**
- Various FEEDs / study assignments

## FIELD DEVELOPMENT & OFFSHORE WIND



- Johan Sverdrup P2 process platform: **Equinor**
- Johan Sverdrup Power from Shore II: **Equinor**
- Dvalin: **Equinor**
- DoIWin5: **TenneT**
- Greater Enfield Ngujima-Yin FPSO: **Woodside Energy**
- Sea Lion FPSO FEED: **BW Offshore**
- Spirit Energy DEM: **Spirit Energy**
- Various FEEDs / study assignments

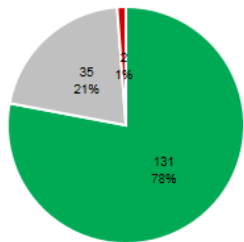
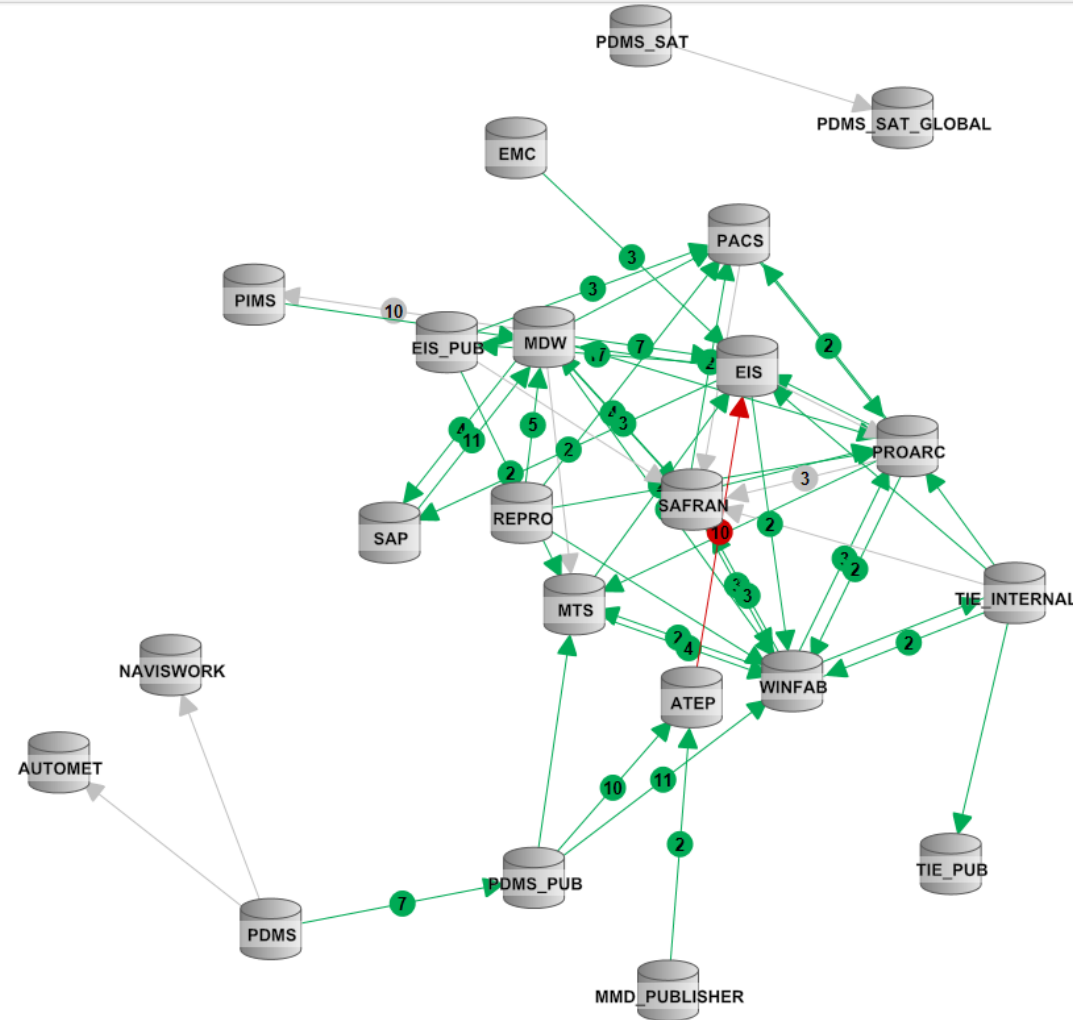
# Use of Safran Project in Aibel

- Implemented version 7.2 in Nov/Dec 2018
- Approximately 90 users (around 150 in peak manning period)
  - Varying from 1 planner projects to major projects with 20 planners
  - Large amount of data on our major projects, i.e. JSDP had approx. 160.000 tasks
- Several internal routines are developed and implemented (Aibel extend)
  - Mainly for importing/exporting data towards external and internal systems
- Typical project setup with 2 networks in Safran; activity-level (for Contract Baseline) and task-level (for detail working schedule)
  - On certain projects also an aggregated network is used for procurement milestone schedule reports
  - Separate networks used sporadically for counting reports (low level)
    - Documents, control objects, etc.

# Use of Safran project in Aibel – complex IT structure

## Interface monitoring

Choose project Filter View Update data



# Use of Safran project in Aibel – import/export routines

The screenshot shows the 'Import/Export Data' menu with options like 'Dashboard', 'Activity Level/Task Level', and 'Import Expended Hours'. A red arrow points from the 'Dashboard' option to the 'Import Dashboard' window on the right.

60	
60	
280	
145	
160	
146	
130	
90	
80	
890	
300	
130	
80	
200	
110	

The 'Import Dashboard' window displays a list of task levels with their execution status and dates. A legend at the bottom explains the status indicators.

Task Level	Status	Action	Date/Time
Activity Lev./Task Lev.	Executed	Transfer	
Actual Hrs. Import	Executed	Import	22.10.19 11:33
ERP (SAP)	Executed	Material Status	23.10.19 06:54
Engineering (EIS)	Not Executed	Eamed Prg.	05.09.19 11:02
Draw. & Doc. (ProArc)	Not Executed	Eamed Prg.	29.08.18 09:50
WEB	Executed	Import	22.10.19 09:54
Construction (WinFab)	Executed	Structural	22.10.19 08:13
Work Prep. (PACS)	Not Executed	Activity Imp.	
Resource Avail. (RePro)	Not Executed	Import	
DEES	Not Executed	Import	
4-d	Not Executed	Import	
Procosys	Not Executed	Import	

**Network Info:**  
 Level: Task  
 Cut-Off: 20.10.19      Status Update Run: 23.10.19 7:17  
 Status Update Cut-Off: 20.10.19      Status Update Run By: OFSOYVIK(ofsoyvik)

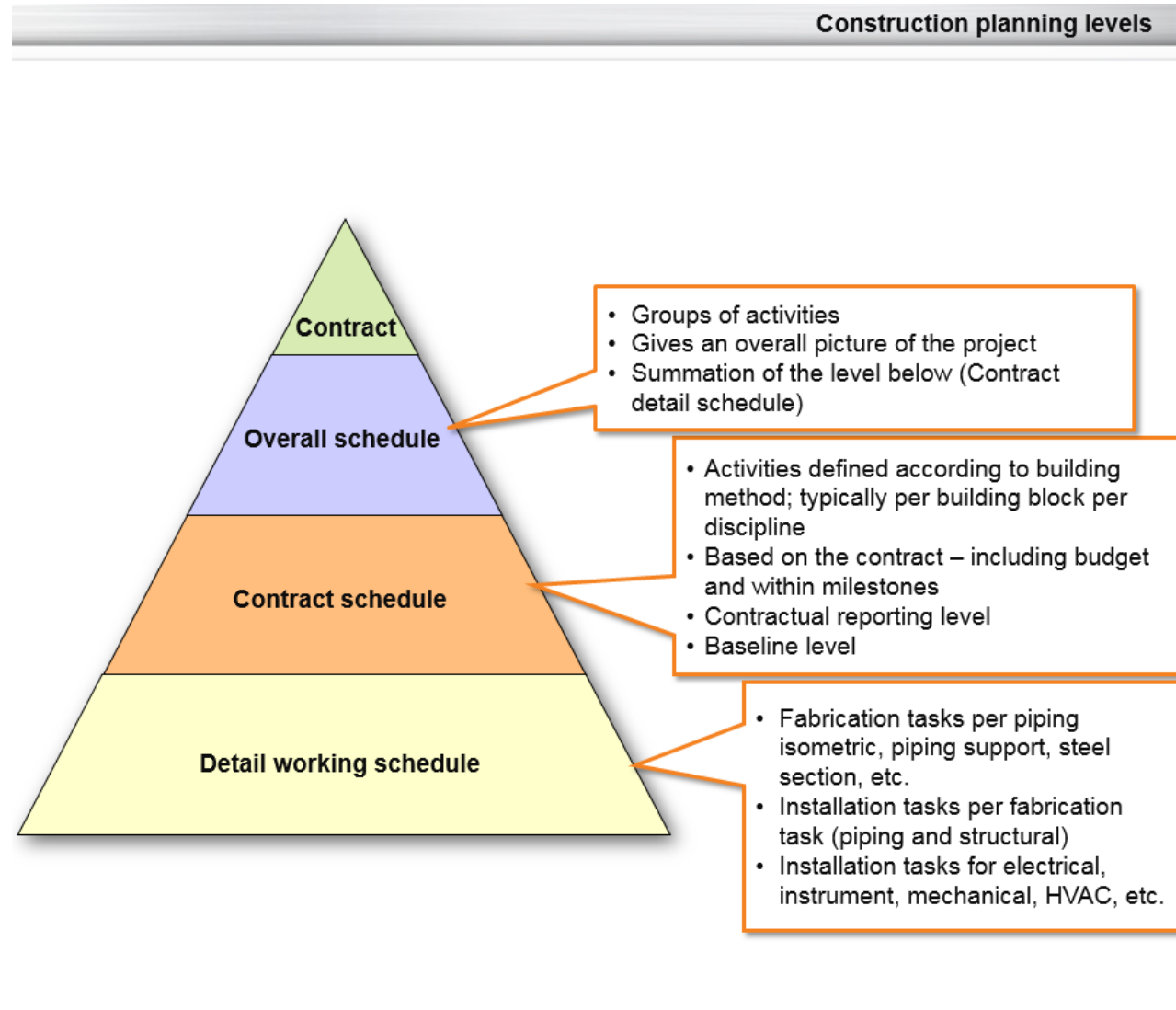
The dialog box shows the version '4.0 - Build 561 - 10.10.2019' and a table of database configurations.

Product	Version	Status
NLSRTL	12.2.0.1.0	Production
Oracle Database 12c Enterprise Edition	12.2.0.1.0	64bit Production
PL/SQL	12.2.0.1.0	Production

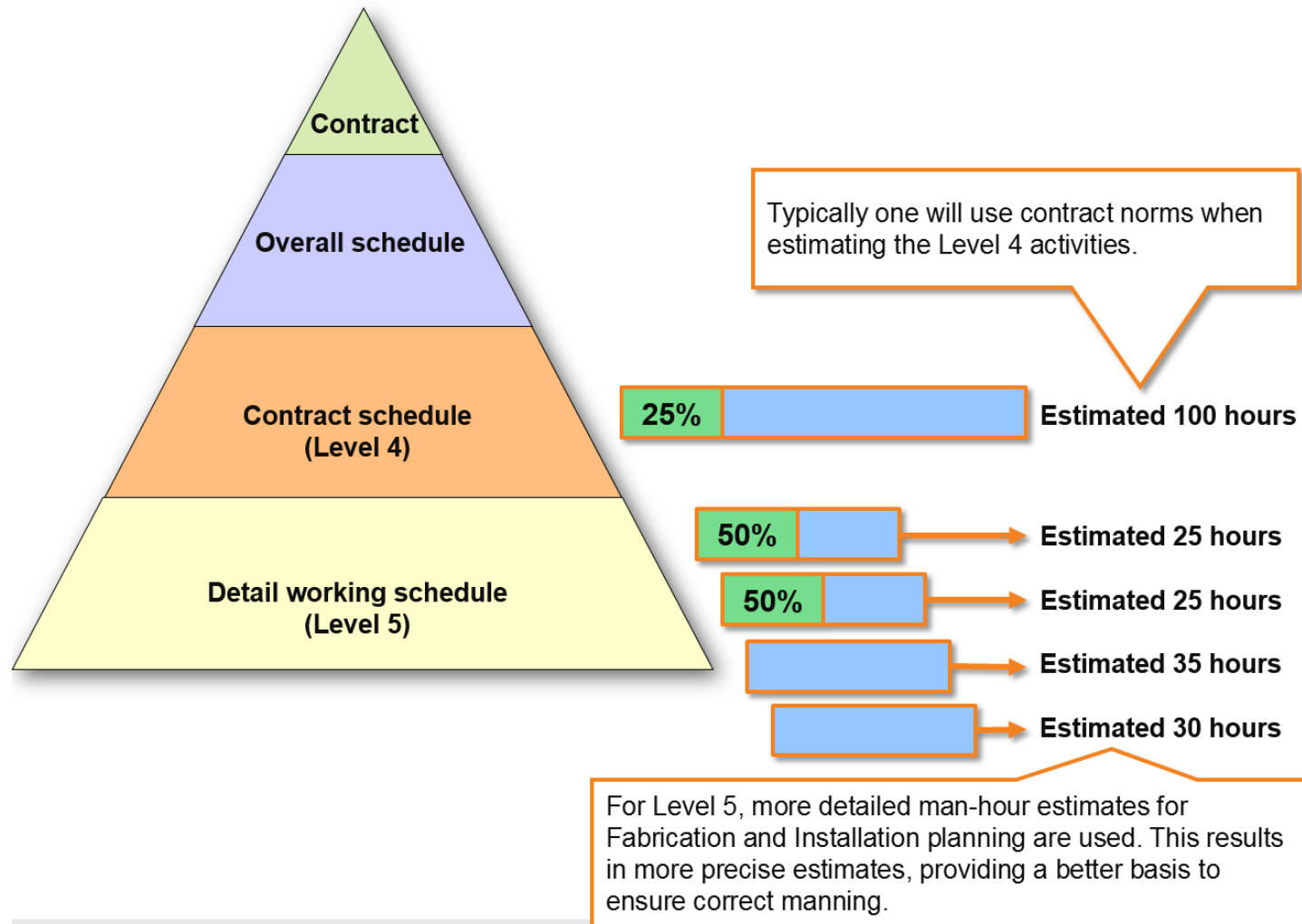




# Use of Safran project in Aibel – 2 planning levels

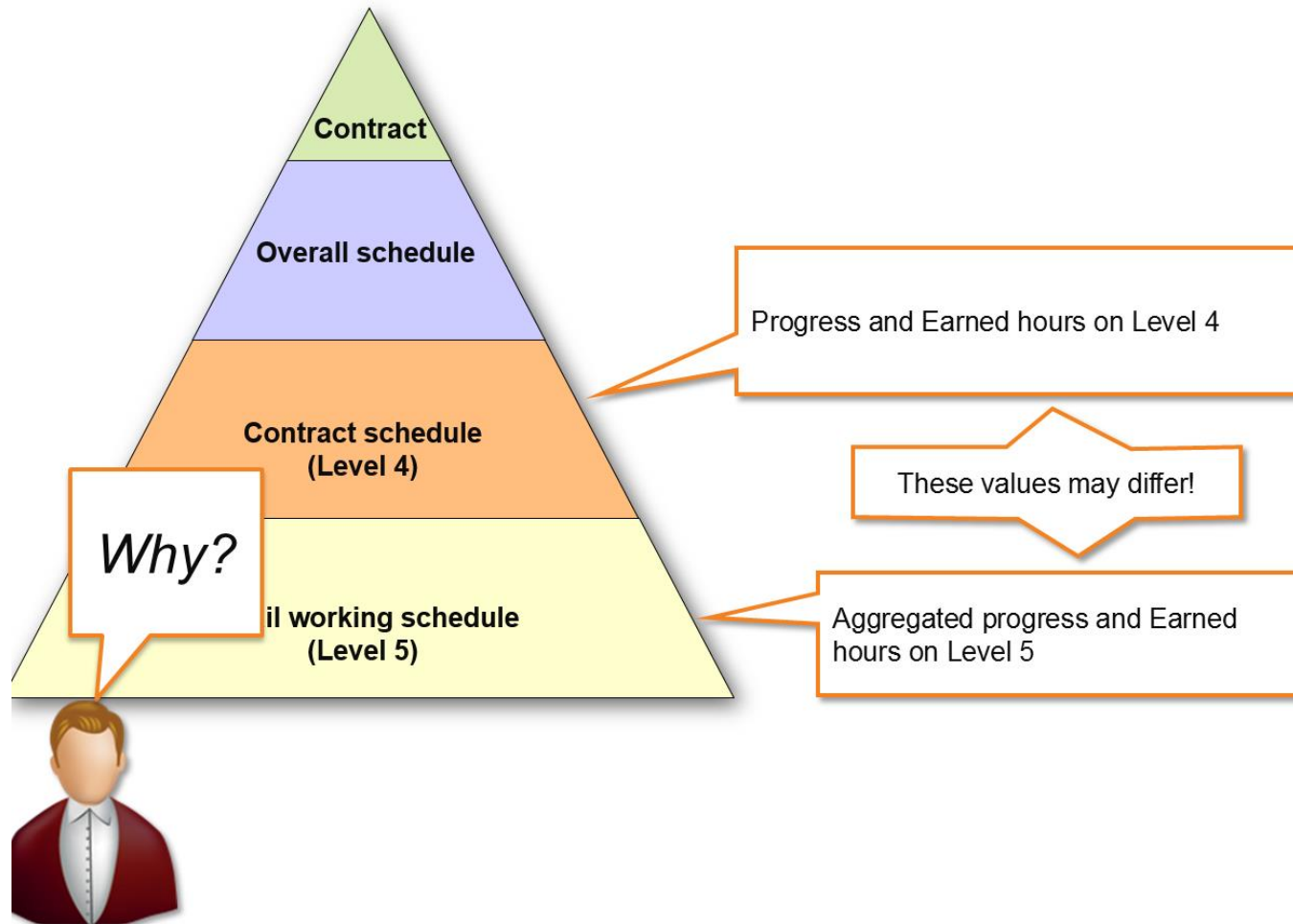


# Use of Safran project in Aibel – 2 planning levels



# Use of Safran project in Aibel – 2 planning levels

Planning levels: Progress aggregation (1/2)



# Use of Safran project in Aibel – 2 planning levels

- Producing progress summaries from different planning levels can (will) cause confusion and/or discussions
  - Ahead of / behind schedule ..
  - Different earned hours ..
  - Different productivity ..



				Period 13.10.19												Next Period				
Discipline	Baseline Mhrs	Current Live Budget	Mhrs	Plan	Act. %											Exp. Mhrs	Perf. Fact.	Pln %	Pln Mhrs	Cum Pln%
				%	%															
<b>Category : 80I Offshore / Site Installation</b>																				
LC Architectural & Building Direct Labour	111 570	111 209	111 209	1,9	1,7											41 390	0,8	2,0	2 270	49,3
LE Electrical Direct labour	111 884	127 747	126 717	0,9	1,0											32 288	0,8	1,0	1 204	29,6
LH HVAC Direct Labour	34 092	34 048	34 092	1,3	0,4											5 424	0,7	1,3	435	31,8
LJ Instrument & Telecom. Direct Labour	144 424	129 506	129 424	0,6	0,5	785	670	-115	528	0,8	9,5	13,5	12 334	17 415	5 081	11 263	0,6	0,7	922	10,2
LL Piping Direct Labour	87 619	85 014	94 332	3,2	2,0	3 013	1 860	-1 153	2 615	1,4	41,4	36,8	39 074	34 697	-4 377	40 712	1,2	3,3	3 084	44,7
LN Structural Direct Labour	218 254	223 582	247 805	2,2	1,9	5 481	4 687	-795	4 493	1,0	64,7	65,4	160 221	162 116	1 895	177 556	1,1	2,3	5 804	67,0
LR Mechanical Direct Labour	33 540	34 433	34 749	2,6	0,9	912	324	-589	305	0,9	63,2	55,8	21 974	19 394	-2 580	13 722	0,7	2,9	1 005	66,1
LS Safety Direct Labour	1 140	1 140	1 140	0,0	0,0	0	0	0	0	0,0	0,0	0,0	0	0	0	0	0,0	0,0	0	0,0
LT Telecom. Direct Labour	27 669	27 671	27 669	0,9	0,2	243	53	-190	64	1,2	13,6	11,2	3 750	3 111	-639	2 029	0,7	0,9	243	14,4
LX Insulation Direct Labour	18 047	18 643	18 103	0,4	0,0	66	0	-66	0	0,0	3,6	4,8	647	869	222	295	0,3	0,4	66	3,9
LZ Other Direct Labour	10 000	10 100	10 100	2,8	2,8	278	278	0	324	1,2	87,5	87,5	8 833	8 833	0	10 228	1,2	2,8	278	90,2
<b>Total 80I Offshore / Site Installation</b>	<b>798 240</b>	<b>803 093</b>	<b>835 340</b>	<b>1,7</b>	<b>1,3</b>	<b>14 432</b>	<b>11 108</b>	<b>-3 324</b>	<b>10 997</b>	<b>1,0</b>	<b>41,4</b>	<b>40,9</b>	<b>346 182</b>	<b>341 839</b>	<b>-4 342</b>	<b>334 906</b>	<b>1,0</b>	<b>1,8</b>	<b>15 310</b>	<b>43,3</b>
<b>Total Report</b>	<b>798 240</b>	<b>803 093</b>	<b>835 340</b>	<b>1,7</b>	<b>1,3</b>	<b>14 432</b>	<b>11 108</b>	<b>-3 324</b>	<b>10 997</b>	<b>1,0</b>	<b>41,4</b>	<b>40,9</b>	<b>346 182</b>	<b>341 839</b>	<b>-4 342</b>	<b>334 906</b>	<b>1,0</b>	<b>1,8</b>	<b>15 310</b>	<b>43,3</b>



# Use of Safran project in Aibel – Revised plan

- On several projects we use Revised plan (agreed with Client)
- “Freeze” schedule between baseline updates
  - Engineering phase: revised typically with quantity updates and/or large variations
  - Construction phase: revised typically every 2<sup>nd</sup> month (weight estimate updating)
- Live schedule can then be used as a live schedule ...
- Some challenges (still) versus reporting not consistent on the revised values



# Use of Safran project in Aibel – linked documents

The screenshot displays the Safran Project - 007520 Task Lev - Group View interface. The top navigation bar includes FILE, HOME, DATA, VIEW, PROJECT, REPORTS, and ADMIN. Below this is a toolbar with various icons for functions like Calendars, Profiles, Resources, User fields, Symbols, Globals, Rules, Complex Rates, Contract Items, Change Register, Linked Documents, Integrated Plan, Check DB Updates, Timer Setup, SQL Queries, Access Level, User Locking, and User Options.

Activity ID	YMP	Description	Plan Start	Plan Finish	L4Activity	Plan%	Act. %	Planned Mhrs	Expended QTY
LH570.1IA12.02	570.1	Refurbishment of dehumidification systems for voids/Cofferdam 3SB/P	01.11.2019	14.11.2019	CHI570.1-IA12			60	0
LH570.1IA12.03	570.1	Refurbishment of dehumidification systems for voids/Void 4 fore ship	01.11.2019	14.11.2019	CHI570.1-IA12			60	0
LH570.1IA7.01	570.1	Upgrade Ballast Pump Room	01.11.2019	13.12.2019	CHI570.1-IA06			280	0
LH570.1IA12.04	570.1	Refurbishment of dehumidification systems for voids/EXTRA - Void 2 skea New Dehum	01.11.2019	30.01.2020	CHI570.1-IA12			145	0
LH570.1IA2.01									0
LH570.1IA2.02									0
LH570.1IA2.03									0
LH570.1IA2.04									0
LH570.1IA2.05									0
LH570.1IA5.01									0
LH570.1IA5.02									0
LH570.1IA8.01									0
LH570.1IA3.09									0

A red arrow points from the 'Upgrade Ballast Pump Room' activity row to a document viewer window. The window title is 'NJB\_REFURB\_T UPGRADE BALLAST PUMP ROOM'. The document number is 'LH570.1IA7.01'. The viewer shows a list of files with columns for 'Name', 'Original file name', and 'Description'. One file is listed: '13474107.DOCX'.

Opens the related jobpack directly from document system. Can also link to material status, completion system, etc

# Use of Safran project in Aibel – Safran web access

Project - 007520 Act Lev Njord B / Categories

<b>External reports (weekly)</b> Reports: 10 CutOff: 20.10.2019	<b>Total reports (Level4)</b> Reports: 7 CutOff: 20.10.2019	<b>Engineering</b> Reports: 4 CutOff: 20.10.2019	<b>Procurement</b> Reports: 8 CutOff: 20.10.2019
<b>Prefabrication (Level4)</b> Reports: 2 CutOff: 20.10.2019	<b>Installation (Level4)</b> Reports: 6 CutOff: 20.10.2019	<b>Diverse</b> Reports: 1 CutOff: 25.07.2019	

Project - 007520 Task Lev Njord B / Categories

<b>Level5 Installasjon</b> Reports: 26 CutOff: 20.10.2019	<b>Level5 Testplaner</b> Reports: 6 CutOff: 20.10.2019	<b>Level5 Prefab</b> Reports: 16 CutOff: 20.10.2019
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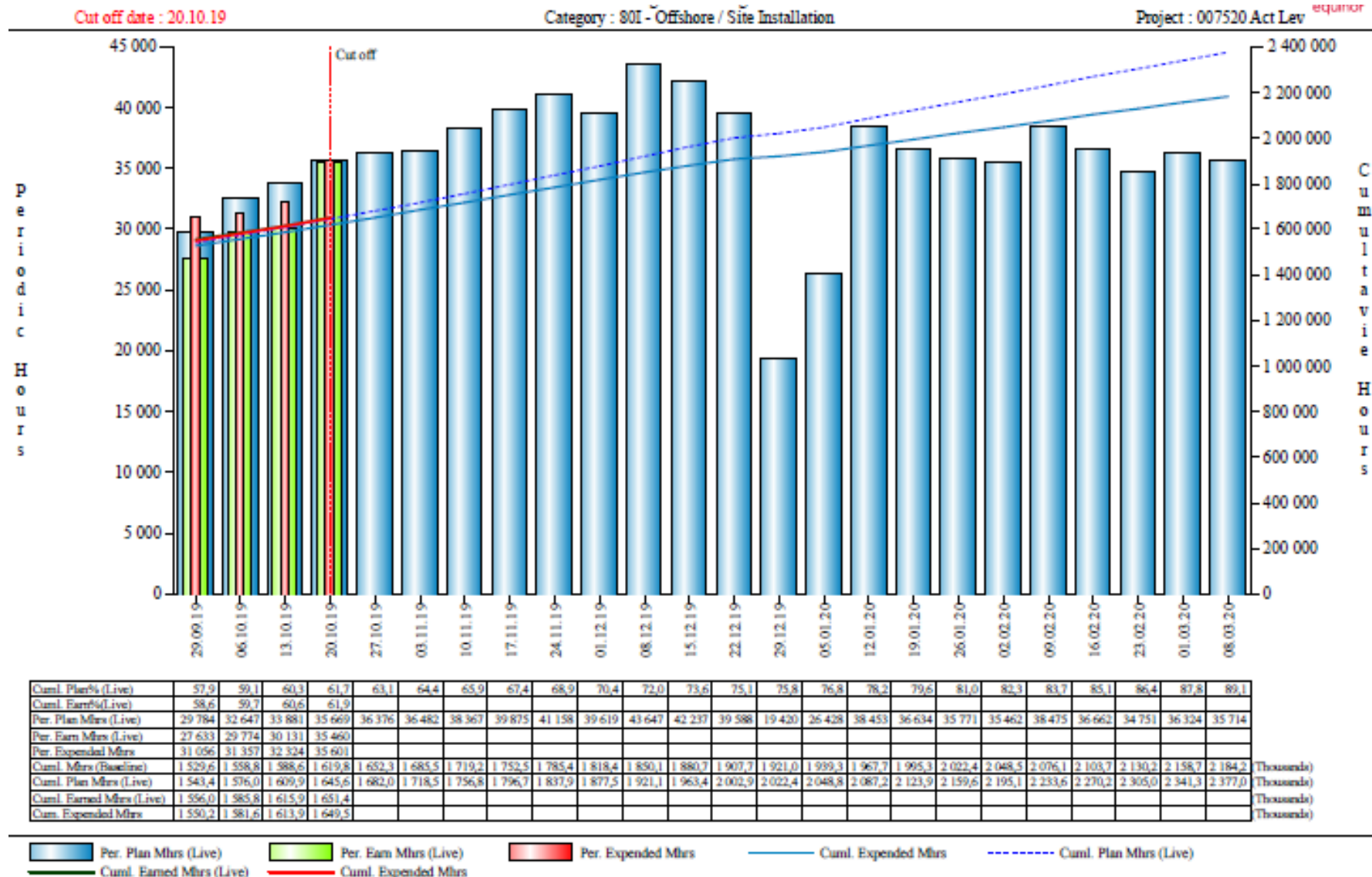
# Use of Safran project in Aibel – portfolio overview

aibel		Portefølje - MOD prosjekter Staffjord (REL, FUT)						equinor										
Prosjektplan Level 1																		
Activity ID	Project Manager	Subproj Status	Description	Early Start	Early Finish	Plan %	Actual %	2019					2020					
								06	07	08	09	10	11	12	01	02	03	04
<b>1100</b>		REL	<b>Staffjord A</b>	06.02.17	20.12.19	98,9	98,7											
201406		REL	SFA Ejector [M.O037C.7LA.0003, MOD, REL]	11.12.17	07.11.19	99,9	100,0											
201407		REL	SFA Recompression [M.O037C.7LA.0005, MOD, ABREL]	06.02.17	18.11.19	99,3	99,1											
201408		REL	SFA Import of Start-Up Gas [M.O037C.7LA.0004, MOD, REL]	11.12.17	24.10.19	100,0	100,0											
201414		REL	Utbedring av open drain system [M.O037C.8LA.0003, MOD, STREL]	22.02.19	20.12.19	47,2	41,3											
<b>1101</b>			<b>Staffjord B</b>	22.06.18	20.01.21	34,0	26,3											
202423		REL	Well B-05 New water injector [M.O037C.8LB.0007, MOD, REL]	22.06.18	03.02.20	79,1	87,7											
202424		REL	Robustified compressor pressure protection [M.O037C.7LB.0007, MOD, REL]	09.01.19	27.04.20	58,5	57,3											
202427		REL	Well B-29 Gaslift Hook-up, MSAS & X-over [M.O037C.8LB.0011, MOD, ABRE]	03.12.18	14.01.20	82,7	70,9											
202428		REL	Extended lifetime of 6kV and new el-panel protection - SFB [M.O037C.7LB.0000]	09.09.19	15.04.20	20,4	13,5											
202429		REL	Well B-38 Prepare for water injection [M.O037C.9LB.1906, MOD, ABREL]	27.09.19	02.07.20	21,4	7,7											
202430		REL	Well B-17 AGLS [M.O037C.19.B.0004, MOD, ABREL]	21.10.19	19.08.20	46,3	0,0											
202431		REL	Well B-39 WAG injection [M.O037C.19.B.0005, MOD, ABREL]	21.10.19	07.08.20	0,0	0,0											
2024XX1		FUT	Upgrade fire monitor [, MOD, FUT]	25.10.19	14.01.20	0,0	0,0											
2024XX5		FUT	Corrosion HVAC in M24U offices [SFB_PRE_310, MOD, FUT]	22.11.19	05.02.20	0,0	0,0											
2024XX6		FUT	Robustgjøring av luftkompressorene [SFB_PRE_313, MOD, FUT]	24.01.20	30.03.20	0,0	0,0											
2024XX8		FUT	Gammelt elektroklorinator anlegg - SFB [SFB_PRE_318, MOD, FUT]	24.04.20	14.07.20	0,0	0,0											
2024XX9		FUT	Hovedgen. Oppgrad. spenningsreg. SFB [SFB_PRE_39, MOD, FUT]	30.10.20	20.01.21	0,0	0,0											
B14		FUT	Well B14 [M.O037C.XXX.XXXX, MOD, FUT]	20.03.20	19.01.21	0,0	0,0											
B23		FUT	Well B23 [M.O037C.XXX.XXXX, MOD, FUT]	31.01.20	20.11.20	0,0	0,0											
<b>1102</b>			<b>Staffjord C</b>	08.10.18	20.01.21	46,3	42,2											
203423		REL	Robustified compressor pressure protection [M.O037C.7LC.0004, MOD, REL]	09.01.19	16.12.19	81,2	75,1											
203424		REL	Well C-08 Gaslift hook-up, MSAS & New FL [M.O037C.8LC.0013, MOD, ABRE]	08.10.18	07.01.20	98,5	98,4											
203425		REL	Well C-27 Gaslift hook-up, MSAS & New FL [M.O037C.8LC.0014, MOD, ABRE]	08.10.18	11.08.20	37,7	37,6											
203426		REL	Auto depress. of exp. gas segment [M.O037C.8LC.0006, MOD, REL]	28.01.19	28.11.19	97,0	70,2											
203427		REL	C36 New blowdown line from Annulus B [M.O037C.8LC.0017, MOD, ABREL]	05.04.19	12.05.20	55,5	50,4											
203428		REL	Utbedring av korrosjonsfunn i utstyrsskaft [M.O037C.9D.3.1901, MOD, STREL]	17.06.19	25.10.19	93,1	71,3											
203429		REL	Well C-40 AGLS and LP extention [M.O037C.9LC.1903, MOD, ABREL]	26.06.19	30.06.20	24,0	15,0											
203430		REL	Extended lifetime of 6kV and new el-panel protection - SFC [M.O037C.7LC.0010]	03.09.19	18.05.20	24,4	12,1											
2034XX3		FUT	Oppgrad. elektroklorinator anlegg - SFC [SFC_PRE_319, MOD, FUT]	24.04.20	14.07.20	0,0	0,0											
2034XX4		FUT	Hovedgen. Oppgrad. spenningsreg. SFC [SFC_PRE_322, MOD, FUT]	30.10.20	20.01.21	0,0	0,0											
2034XX5		FUT	Robustgjøring av luftkompressorene [SFC_PRE_326, MOD, FUT]	24.01.20	30.03.20	0,0	0,0											
2034XX7		FUT	Utskifting av DAHR-stasjoner med tilhørende rørføring [SFC_PRE_330, MOD, FUT]	15.05.20	25.08.20	0,0	0,0											
C02A		FUT	Well C02-A [M.O037C.XX.XXXX, MOD, FUT]	25.10.19	25.08.20	0,0	0,0											
C22		FUT	Well C-22 [M.O037C.XX.XXXX, MOD, FUT]	13.12.19	17.11.20	0,0	0,0											





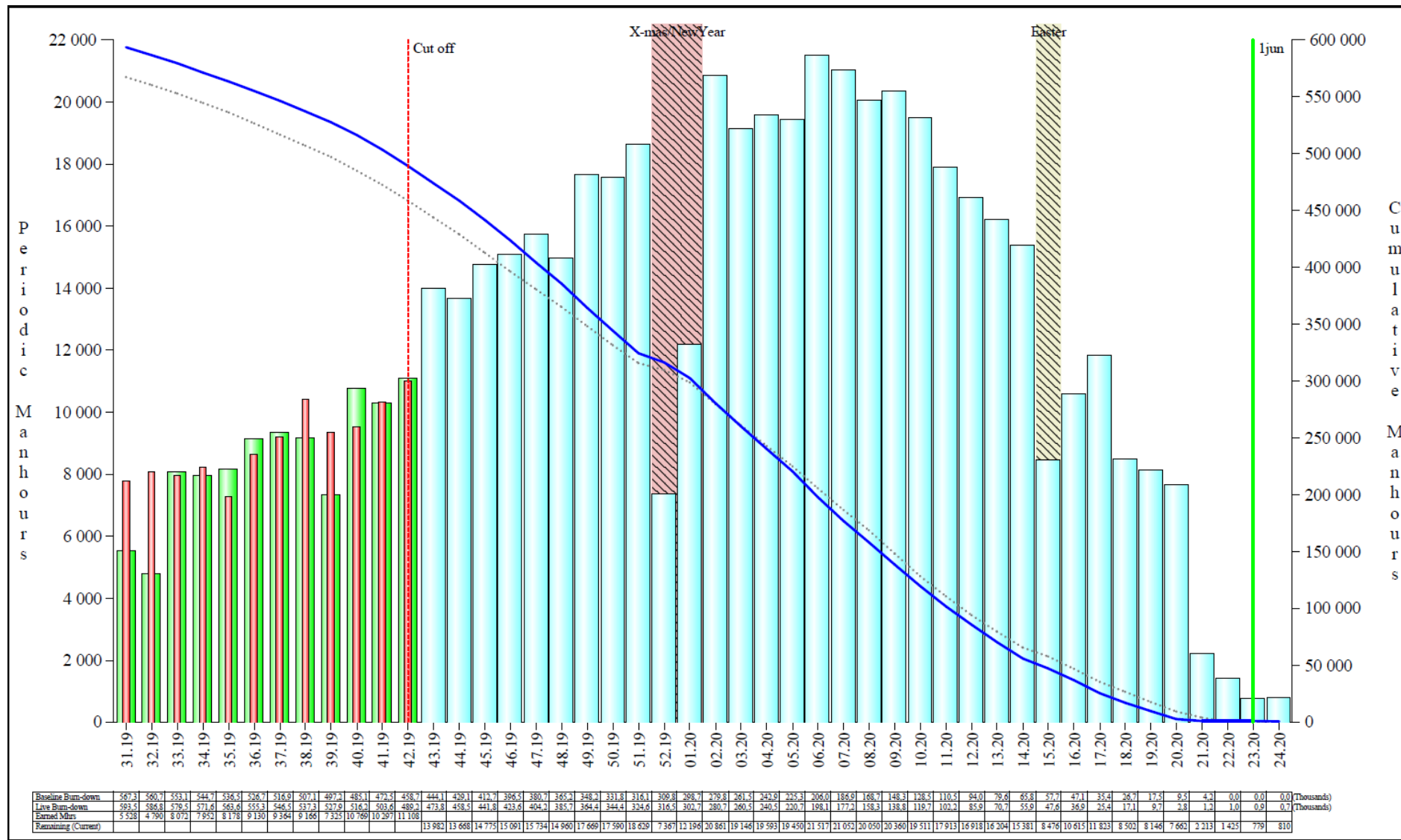
# Use of Safran project in Aibel – S-curves



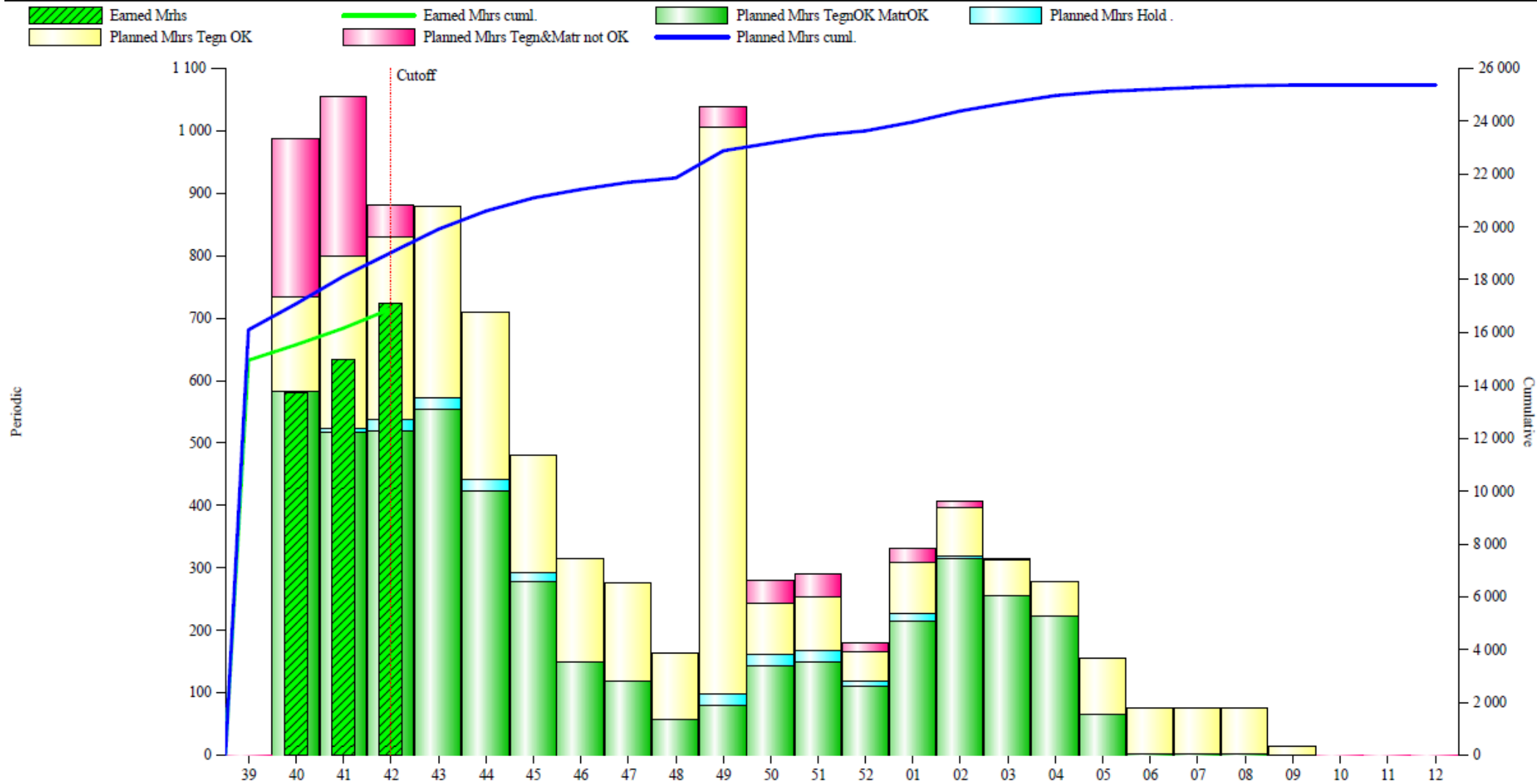
# Use of Safran project in Aibel – extended PMP report

<i>Discipline: KC -Architectural &amp; Building</i>				
<b>Package no.: KC001</b>		<b>Internal and External Doors</b>		
<b>Crit.:</b> No	<b>Supplier:</b> <del>Agg. Borealis</del>	<b>Comp:</b> 5.3	<b>PI. Vend. Data Need Float ( P110 - P100): Plan: Forc.:</b>	
<b>PE:</b> <del>Agg. Borealis</del>	<b>Build.Block:</b> B201 SKIDS/MOD	<b>Priority:</b>	<b>Delivery Float ( P165 - P160): Plan: Forc.:</b>	
<b>PB:</b> <del>Agg. Borealis</del>	<b>Vend. Lead Time:</b> 181	<b>Category:</b>	<b>Comment:</b>	
<b>Mil. no.</b>	<b>Milestone Description</b>	<b>Planned (Baseline)</b>	<b>Forecast (Live)</b>	<b>Actual</b>
P020	Tech. req. inquiry (or MTO) issued	16.10.15	16.10.15	16.10.15
P030	Issue Inquiry	16.10.15	16.10.15	16.10.15
P070	PO Issued	18.12.15	18.12.15	18.12.15
P150	Ex works date	17.06.16	17.06.16	17.06.16
P160	Delivery on site	01.07.16	01.07.16	01.07.16
P165	Site need	01.07.16	01.07.16	01.07.16
<i>End of package KC001</i>				
<b>Package no.: KC005</b>		<b>External Walls &amp; Windshield Cladding</b>		
<b>Crit.:</b> No	<b>Supplier:</b> <del>PCM</del>	<b>Comp:</b> 5.3	<b>PI. Vend. Data Need Float ( P110 - P100): Plan: Forc.:</b>	
<b>PE:</b> <del>Agg. Borealis</del>	<b>Build.Block:</b> B201 SKIDS/MOD	<b>Priority:</b>	<b>Delivery Float ( P165 - P160): Plan: Forc.:</b>	
<b>PB:</b> <del>Agg. Borealis</del>	<b>Vend. Lead Time:</b> 181	<b>Category:</b>	<b>Comment:</b>	
<b>Mil. no.</b>	<b>Milestone Description</b>	<b>Planned (Baseline)</b>	<b>Forecast (Live)</b>	<b>Actual</b>
P020	Tech. req. inquiry (or MTO) issued	02.10.15	02.10.15	02.10.15
P030	Issue Inquiry	02.10.15	02.10.15	02.10.15
P070	PO Issued	18.12.15	18.12.15	18.12.15
P150	Ex works date	17.06.16	17.06.16	17.06.16
P160	Delivery on site	01.07.16	01.07.16	01.07.16
P165	Site need	01.07.16	01.07.16	01.07.16
<i>End of package KC005</i>				

# Use of Safran project in Aibel – burndown curves



# Use of Safran project in Aibel – barchart histogram stacked on computed field for status

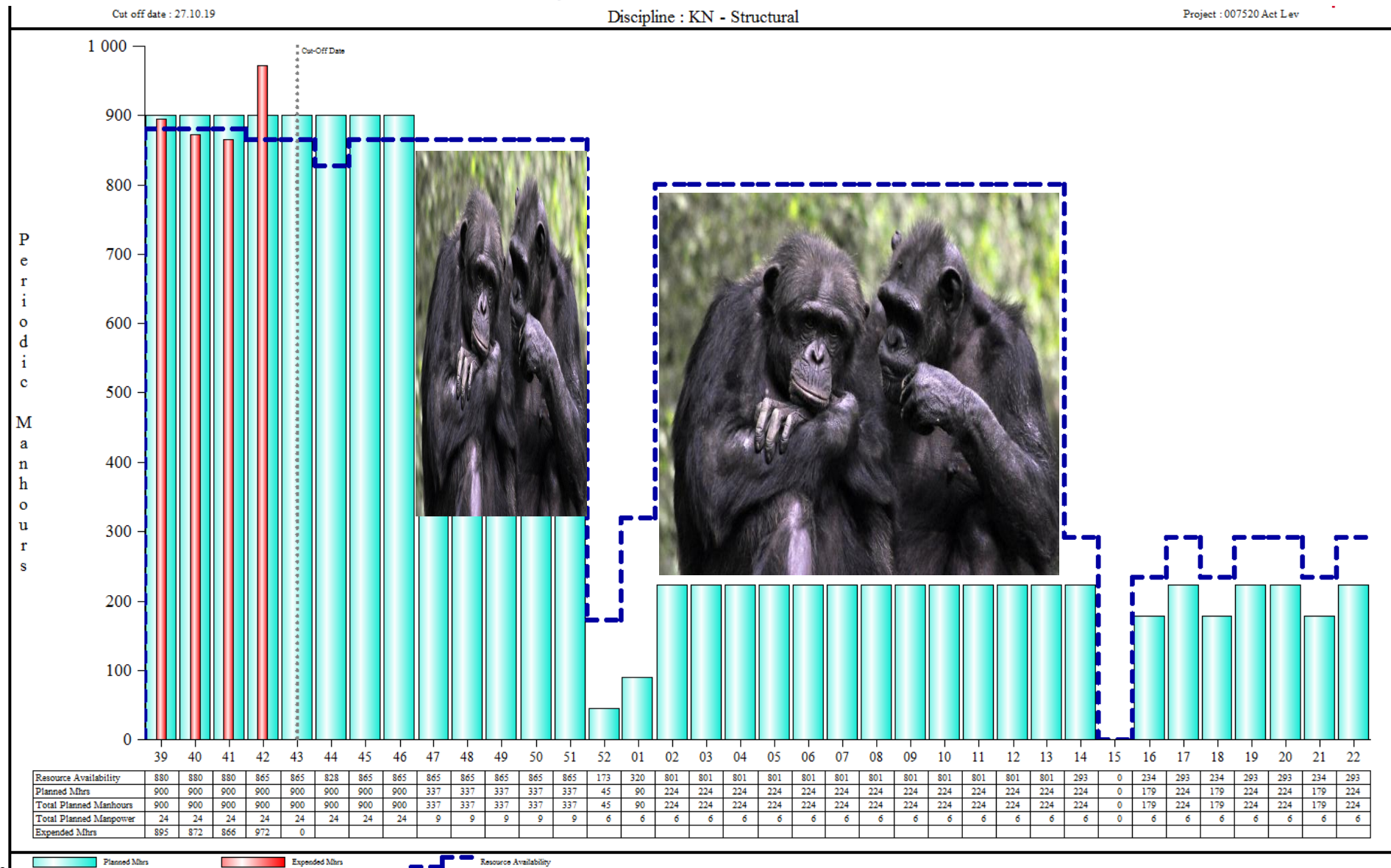


	Values																									
Eamed Mhrs	0	582	633	724																						
Eamed Mhrs cuml.	14 949	15 530	16 164	16 888																						
Planned Mhrs TegnOK MatrOK	0	583	517	520	554	423	278	149	120	57	81	143	149	112	216	316	256	223	66	3	3	3	1	0	0	0
Planned Mhrs Hold .	0	1	7	18	18	18	14	0	0	0	18	18	18	7	11	4	0	0	0	0	0	0	0	0	0	0





# Use of Safran project in Aibel – coupling manning data from mobilization system versus plan



**aibel<sup>®</sup>**