-> Navantia

User case of complex Programme Planning and Scheduling: S-80 Submarines at Navantia Forum Safran 2023

> Cristina Sancho Berlanga S-80 Programme Planning Manager



The programme

The planning department

The tools





NAVANTIA a 100% state-owned naval technology company

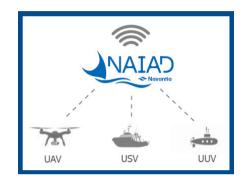
Leading company in the defence sector

More of 300 YEARS of experience

Strategic for Spanish Defence

Exports to over 25 countries

More than 5000 professionals



Business areas



S-80 Submarines at Navantia

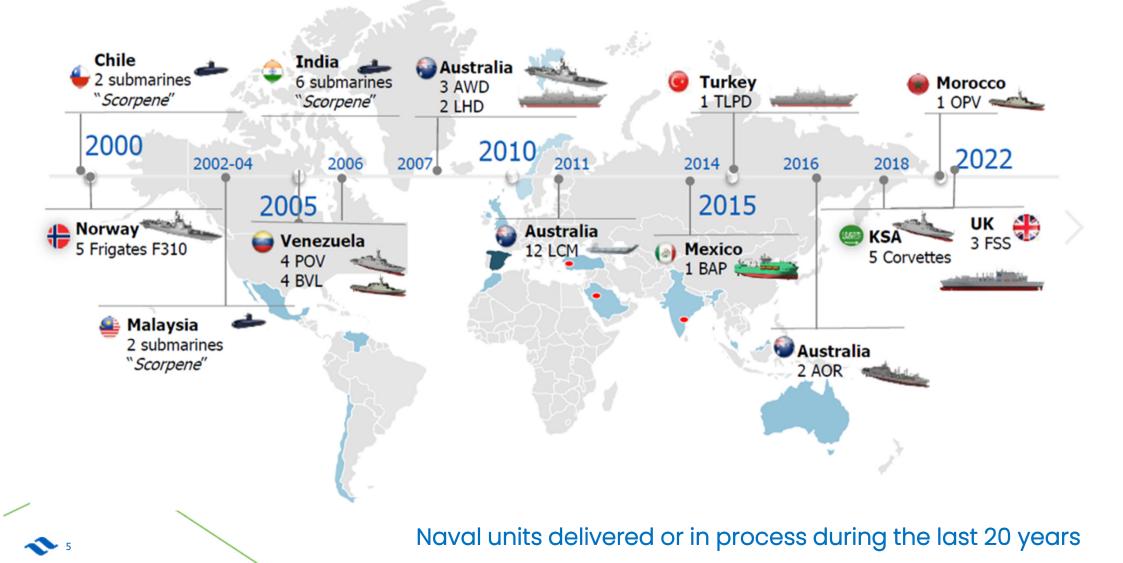
The company

National: main supplier for the Spanish Navy



Naval units delivered or in process during the last 20 years

International: permanently offering support to more than 25 countries



Facilities: three locations in Spain with shipyards and other infraestructure



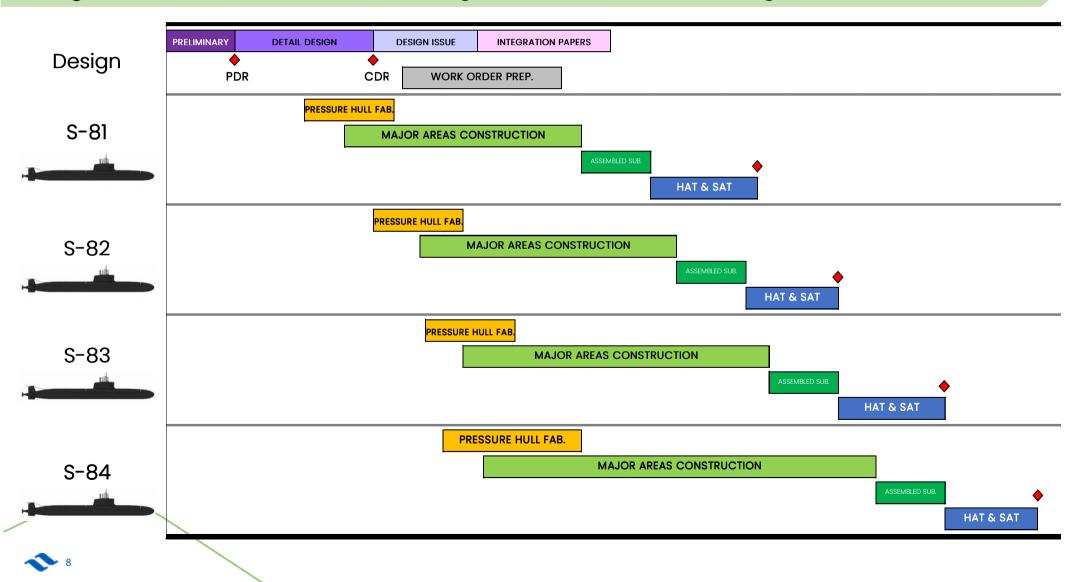
The programme

Programme S-80: interrelated multidisciplinary Projects handled by different facilities



The programme

Programme S-80: consists of the design, construction and testing of 4 submarines



S-80 Submarines at Navantia



Main functions and responsibilities

Develop the Program Planning

Establish the Baseline/s to measure against and assess Projects performance

Identify and highlight risks and opportunities

Ensure that all areas involved in the process are included in the plan

Define WBS structures, assign budget and verify traceability

Monitor Project development

The planning department

Main planning areas

Engineering

Functional design 3D model and design publishing

Production Engineering and Production Management

Building strategy Work order preparation and material availability checks

Procurement

Order placement Materials reception

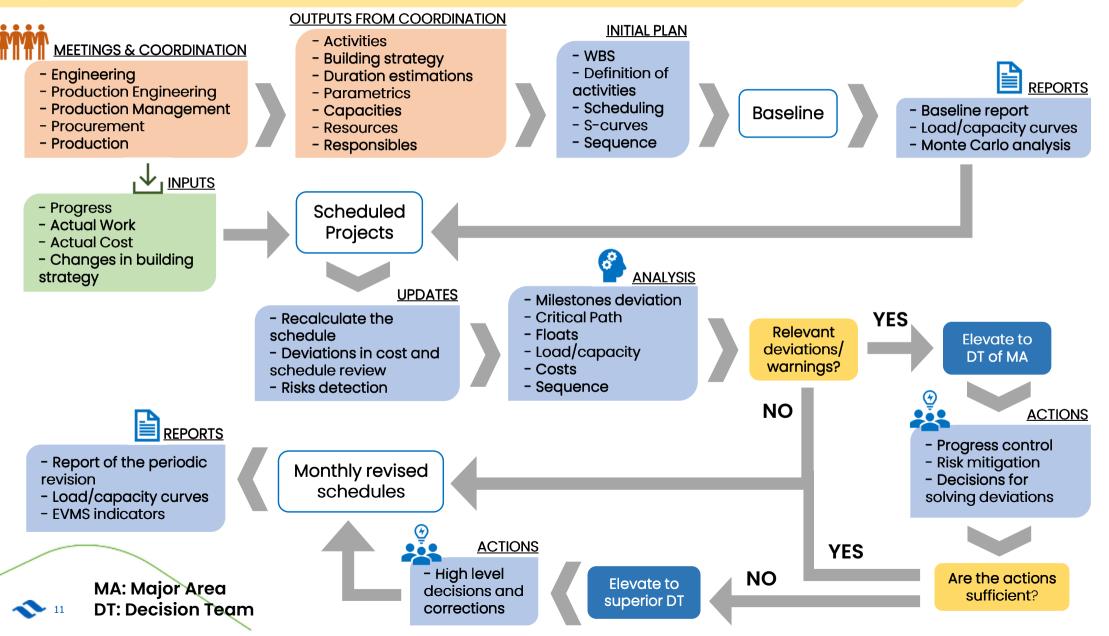
Production

Pressure hull and steel fabrication, elements assembly Ship testing

S-80 Submarines at Navantia

The planning department

Our workflow



The planning department

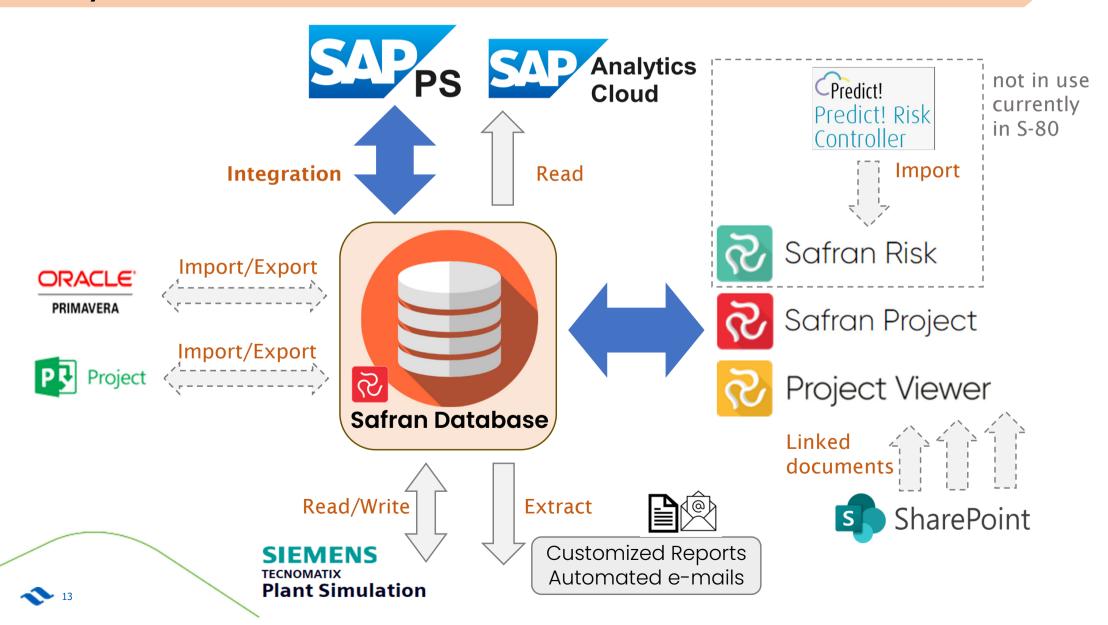
A briefer summary of our workflow

🕣 IN

- Building Strategy
- Historic data (Budget and durations)
- Shipyard capacities & capabilities
- Actual data

- Updated plan
- Load capacity curves
- Need dates for materials
- Planning reliability
- Mitigation actions
 - OUT

Ecosystem of Safran and other tools



"Special" features used by Navantia to present today:

1. Integration SAP - Safran

2. Project Groups

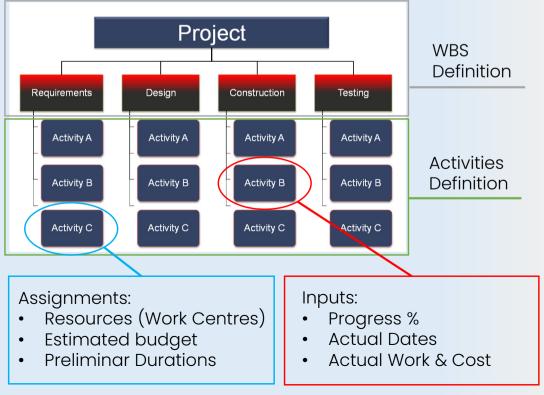
3. Database automations

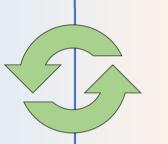


1. Integration SAP PS – Safran Project



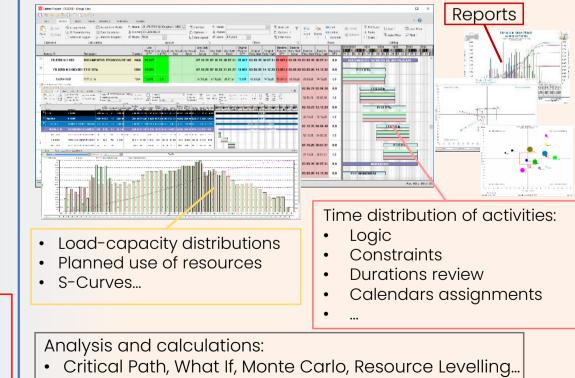
Definition of scope and structure of Projects





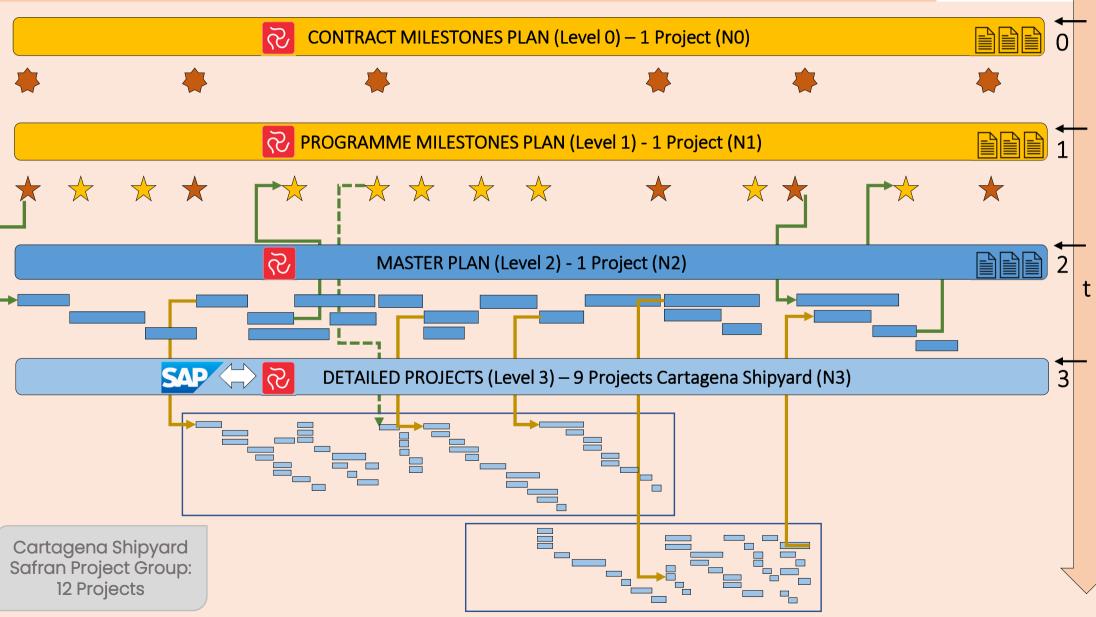


Analysis and scheduling of Projects

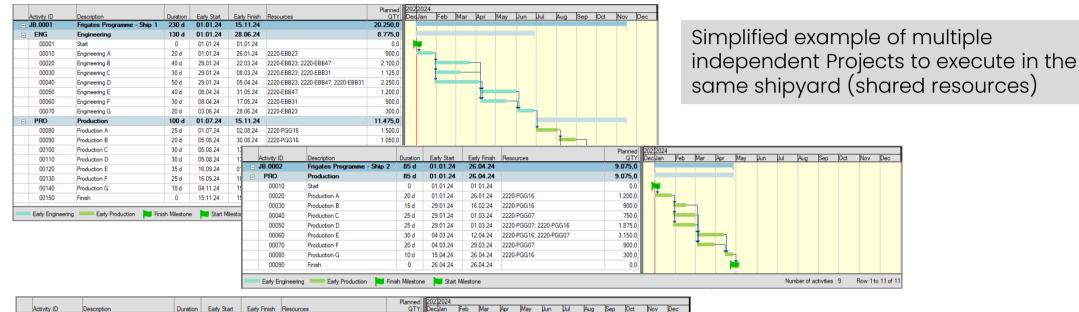


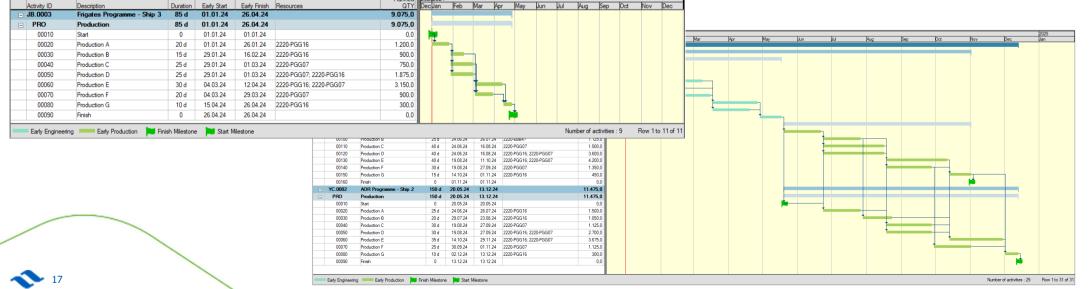
- Control and monitoring: updates schedule & impacts
- Rescheduling Dates, Floats, Logic...

2. Project Groups: Integrated Programme Planning (I)



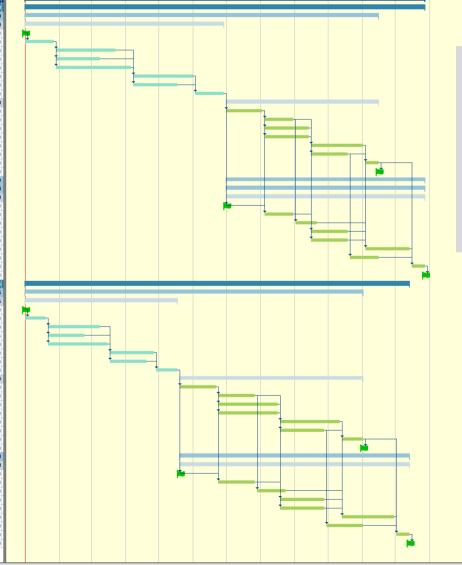
2. Project Groups: analysis of load-capacity from multiple projects using shared resources





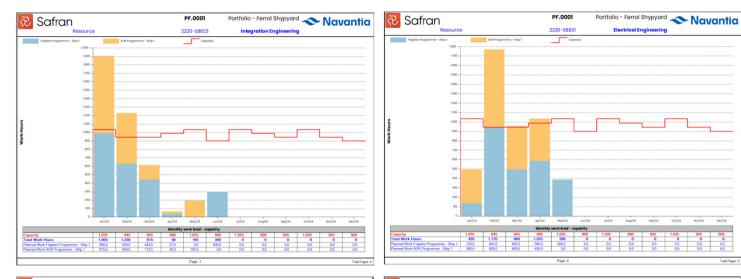
2. Project Groups: analysis of load-capacity from multiple projects using shared resources

	Activity ID	Description	Duration	Early Start	Early Finish	Resources	Planner QT
	PF.0001	Portfolio - Shipyard Ferrol	260 d	01.01.24	27.12.24		70.462.5
	JB.0000	Frigates Programme	260 d	01.01.24	27.12.24		38.400,0
	JB.0001	Frigates Programme - Ship 1	230 d	01.01.24	15.11.24		20.250,0
•	ENG	Engineering	130 d	01.01.24	28.06.24		8.775,0
	00001	Start	0	01.01.24	01.01.24		0.0
	00010	Engineering A	20 d	01.01.24	26.01.24	2220-EBB23	900,0
	00020	Engineering B	40 d	29.01.24	22.03.24	2220-EBB23; 2220-EBB47	2.100,0
	00030	Engineering C	30 d	29.01.24	08.03.24	2220-EBB23; 2220-EBB31	1.125,0
	00040	Engineering D	50 d	29.01.24	05.04.24	2220-EBB23; 2220-EBB47; 2220-EBB31	2.250.
	00050	Engineering E	40 d	08.04.24	31.05.24	2220-EBB47	1.200,0
	00060	Engineering F	30 d	08.04.24	17.05.24	2220-EBB31	900,0
	00070	Engineering G	20 d	03.06.24	28.06.24	2220-EBB23	300,0
	PRO	Production	100 d	01.07.24	15.11.24		11.475,0
	08000	Production A	25 d	01.07.24	02.08.24	2220-PGG16	1.500,
	00090	Production B	20 d	05.08.24	30.08.24	2220-PGG16	1.050,
	00100	Production C	30 d	05.08.24	13.09.24	2220-PGG07	1.125,
	00110	Production D	30 d	05.08.24	13.09.24	2220-PGG16; 2220-PGG07	2.700,
	00120	Production E	35 d	16.09.24	01.11.24	2220-PGG16; 2220-PGG07	3.675,0
	00130	Production F	25 d	16.09.24	18.10.24	2220-PGG07	1,125,
	00140	Production G	10 d	04.11.24	15.11.24	2220-PGG16	300,0
	00150	Finish	0	15.11.24	15.11.24		0,0
1	JB.0002	Frigates Programme - Ship 2	130 d	01.07.24	27.12.24		9.075.0
	JB.0003	Frigates Programme - Ship 3	130 d	01.07.24	27.12.24		9.075,0
	PRO	Production	130 d	01.07.24	27.12.24		9.075,0
	00010	Start	0	01.07.24	01.07.24		0.0
	00010	Production A	20 d	05.08.24	30.08.24	2220-PGG16	1.200,0
	00020	Production B	15 d	02.09.24	20.09.24	2220-PGG16	900,0
		Production C	25 d	16.09.24		2220-PGG07	
	00040			16.09.24	18.10.24 18.10.24	2220-PGG07 2220-PGG07; 2220-PGG16	750.0
		Production D	25 d				
	00060	Production E	30 d	04.11.24	13.12.24	2220-PGG16; 2220-PGG07	3.150,
	00070	Production F	20 d	21.10.24	15.11.24	2220-PGG07	900.
	08000	Production G	10 d	16.12.24	27.12.24	2220-PGG16	300.
	00090	Finish	0	27.12.24	27.12.24		0.0
1	YC.0000	AOR Programme	250 d	01.01.24	13.12.24		32.062,5
	YC.0001	AOR Programme Ship 1	220 d	01.01.24	01.11.24		20.587.5
	ENG	Engineering	100 d	01.01.24	17.05.24		6.862,5
	00010	Start Engineering A	0	01.01.24	01.01.24	0000 50000	0.0
	00020			01.01.24	19.01.24	2220-EBB23	675.0
			15 d				
	00030	Engineering B	35 d	22.01.24	08.03.24	2220-EBB23; 2220-EBB47	
	00040	Engineering B Engineering C	35 d 25 d	22.01.24 22.01.24	23.02.24	2220-EBB23; 2220-EBB31	937,5
	00040 00050	Engineering B Engineering C Engineering D	35 d 25 d 40 d	22.01.24 22.01.24 22.01.24	23.02.24 15.03.24	2220-EBB23; 2220-EBB31 2220-EBB23; 2220-EBB47; 2220-EBB31	937. 1.800.
	00040 00050 00060	Engineering B Engineering C Engineering D Engineering E	35 d 25 d 40 d 30 d	22.01.24 22.01.24 22.01.24 18.03.24	23.02.24 15.03.24 26.04.24	2220-EBB23; 2220-EBB31 2220-EBB23; 2220-EBB47; 2220-EBB31 2220-EBB47	937,5 1.800,0 900,0
	00040 00050 00060 00070	Engineering B Engineering C Engineering D	35 d 25 d 40 d	22.01.24 22.01.24 22.01.24 18.03.24 18.03.24	23.02.24 15.03.24	2220-EBB23; 2220-EBB31 2220-EBB23; 2220-EBB47; 2220-EBB31	1.575,(937,5 1.800,(900,(750,(
	00040 00050 00060 00070 00080	Engineering B Engineering C Engineering D Engineering F Engineering F Engineering G	35 d 25 d 40 d 30 d 25 d 15 d	22.01.24 22.01.24 22.01.24 18.03.24 18.03.24 29.04.24	23.02.24 15.03.24 26.04.24 19.04.24 17.05.24	2220-EBB23; 2220-EBB31 2220-EBB23; 2220-EBB47; 2220-EBB31 2220-EBB47	937,5 1.800,0 900,0 750,0 225,0
	00040 00050 00060 00070	Engineering B Engineering C Engineering D Engineering E Engineering F	35 d 25 d 40 d 30 d 25 d	22.01.24 22.01.24 22.01.24 18.03.24 18.03.24	23.02.24 15.03.24 26.04.24 19.04.24	2220-EBB23; 2220-EBB31 2220-EBB23; 2220-EBB47; 2220-EBB31 2220-EBB47 2220-EBB31	937,1 1.800,0 900,0 750,0 225,0
	00040 00050 00060 00070 00080	Engineering B Engineering C Engineering D Engineering F Engineering F Engineering G	35 d 25 d 40 d 30 d 25 d 15 d	22.01.24 22.01.24 22.01.24 18.03.24 18.03.24 29.04.24	23.02.24 15.03.24 26.04.24 19.04.24 17.05.24	2220-EBB23; 2220-EBB31 2220-EBB23; 2220-EBB47; 2220-EBB31 2220-EBB47 2220-EBB31	937, 1.800, 900, 750, 225, 13.725,
	00040 00050 00060 00070 00080 PRO	Engineering B Engineering C Engineering D Engineering E Engineering F Engineering G Production	35 d 25 d 40 d 30 d 25 d 15 d 120 d	22.01.24 22.01.24 22.01.24 18.03.24 18.03.24 29.04.24 20.05.24	23.02.24 15.03.24 26.04.24 19.04.24 17.05.24 01.11.24	2220-EBB23, 2220-EBB31 2220-EBB23, 2220-EBB47, 2220-EBB31 2220-EBB47 2220-EBB31 2220-EBB23	937, 1.800, 900, 750, 225, 13.725, 1.500,
	00040 00050 00060 00070 00080 PRO 00090	Engineering B Engineering C Engineering D Engineering E Engineering F Engineering G Production Production A	35 d 25 d 40 d 30 d 25 d 15 d 120 d 25 d	22.01.24 22.01.24 18.03.24 18.03.24 29.04.24 20.05.24	23.02.24 15.03.24 26.04.24 19.04.24 17.05.24 01.11.24 21.06.24	2220-EBB23: 2220-EBB31 2220-EBB23: 2220-EBB47: 2220-EBB31 2220-EBB23 2220-EBB31 2220-EBB31 2220-EBB23 2220-FBB23	937, 1.800, 900, 750, 225, 13.725, 1.500, 1.125,
	00040 00050 00060 00070 00080 PRO 00090 00100	Ergineering B Engineering C Engineering D Ergineering E Engineering G Production A Production B	35 d 25 d 40 d 30 d 25 d 15 d 120 d 25 d 25 d	22.01.24 22.01.24 22.01.24 18.03.24 18.03.24 29.04.24 20.05.24 20.05.24 20.05.24 24.06.24	23.02.24 15.03.24 26.04.24 19.04.24 17.05.24 01.11.24 21.06.24 26.07.24	2220-EBB23, 2220-EBB31 2220-EBB23, 2220-EBB47, 2220-EBB31 2220-EBB47 2220-EBB23 2220-EBB23 2220-EBB23 2220-EBB47	937, 1,800, 900, 750, 225, 13,725, 1,500, 1,125, 1,500, 1,500,
	00040 00050 00060 00070 00080 PRO 00090 00100 00110	Engineering B Engineering C Engineering D Engineering E Engineering G Production Production A Production B Production C	35 d 25 d 40 d 30 d 25 d 15 d 120 d 25 d 25 d 25 d 40 d	22.01.24 22.01.24 18.03.24 18.03.24 29.04.24 20.05.24 20.05.24 24.06.24 24.06.24	23.02.24 15.03.24 26.04.24 19.04.24 17.05.24 01.11.24 21.06.24 26.07.24 16.08.24	2220-EB823 2220-EB831 2220-EB823 2220-EB847; 2220-EB831 2220-EB847 2220-EB823 2220-EB823 2220-EB823 2220-EB824 2220-EB847 2220-EB847 2220-EG607	937. 1.800, 900, 750, 225, 13.725, 1.500, 1.125, 1.500, 3.600, 3.600,
	00040 00050 00060 00070 00080 PRO 00090 00100 00110 00110	Engineering B Engineering C Engineering D Engineering F Engineering F Production G Production A Production B Production D	35 d 25 d 40 d 30 d 25 d 15 d 120 d 25 d 25 d 25 d 40 d 40 d	22.01.24 22.01.24 18.03.24 18.03.24 29.04.24 20.05.24 20.05.24 24.06.24 24.06.24	23.02.24 15.03.24 26.04.24 19.04.24 17.05.24 01.11.24 21.06.24 26.07.24 16.08.24	2220-EB823, 2220-EB831 2220-EB823, 2220-EB847, 2220-EB831 2220-EB847 2220-EB823 2220-EB823 2220-PGG16 2220-EG847 2220-PGG07 2220-PGG07	937. 1.800. 900. 750. 225. 13.725. 1.500. 1.125. 1.500. 3.600. 4.200.
	00040 00050 00070 00080 PRO 00090 00100 00110 00110 00120 00130	Engineering B Engineering C Engineering D Engineering E Engineering F Production G Production A Production B Production B Production C Production C Production E Production F	35 d 25 d 40 d 30 d 25 d 15 d 120 d 25 d 25 d 40 d 40 d 40 d 30 d	22.01.24 22.01.24 22.01.24 18.03.24 29.04.24 20.05.24 24.06.24 24.06.24 24.06.24 19.08.24 19.08.24	23.02.24 15.03.24 26.04.24 19.04.24 17.05.24 01.11.24 21.06.24 26.07.24 16.08.24 16.08.24 11.10.24 27.09.24	2220-EB823, 2220-EB831 2220-EB823, 2220-EB847, 2220-EB831 2220-EB847 2220-EB823 2220-EB823 2220-EB823 2220-EB847 2220-EB847 2220-PGG16, 2220-PGG07 2220-PGG16, 2220-PGG07 2220-PGG07	937.; 1.800,(900,(750,(225,(13.725,(1.500,(1.125,(1.500,(3.600,(4.200,(1.350,(1
	00040 00050 00060 00070 00080 PRO 00090 00100 00110 00120 00130	Engineering B Engineering C Engineering D Engineering E Engineering G Production G Production A Production B Production C Production D Production D Production E	35 d 25 d 40 d 30 d 25 d 15 d 120 d 25 d 25 d 25 d 40 d 40 d	22.01.24 22.01.24 18.03.24 18.03.24 29.04.24 20.05.24 20.05.24 24.06.24 24.06.24 19.08.24	23.02.24 15.03.24 26.04.24 19.04.24 17.05.24 01.11.24 21.06.24 26.07.24 16.08.24 16.08.24 11.10.24	2220-EB823: 2220-EB831 2220-EB823: 2220-EB847: 2220-EB831 2220-EB831 2220-EB823 2220-EB823 2220-EB847 2220-EB847 2220-EB647 2200-EB647 200-EB6	937.; 1.800, 900, 750, 225, 1.500, 1.125, 1.500, 1.125, 1.500, 1.250, 1.500, 1.3600, 4.200, 1.350, 4.50
	00040 00050 00000 PRO 00090 00100 00110 00120 00130 00140 00150 00160	Engineering B Engineering C Engineering D Engineering F Engineering G Production G Production A Production B Production B Production C Production C Production F Production F Production F Production F Production F	35 d 25 d 40 d 30 d 25 d 15 d 25 d 25 d 25 d 40 d 40 d 40 d 30 d 15 d 0	22.01.24 22.01.24 22.01.24 18.03.24 18.03.24 29.04.24 20.05.24 20.05.24 24.06.24 24.06.24 24.06.24 19.08.24 19.08.24 19.08.24 19.08.24 10.024	23.02.24 15.03.24 26.04.24 19.04.24 17.05.24 01.11.24 21.06.24 26.07.24 16.08.24 16.08.24 11.10.24 27.09.24 01.11.24	2220-EB823, 2220-EB831 2220-EB823, 2220-EB847, 2220-EB831 2220-EB847 2220-EB823 2220-EB823 2220-EB823 2220-EB847 2220-EB847 2220-PGG16, 2220-PGG07 2220-PGG16, 2220-PGG07 2220-PGG07	937.5 1.800.0 900.0 750.0 225.0 13.725.0 1.500.0 1.125.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0
	00040 00050 00070 00080 PRO 00090 00100 00110 00120 00130 00140 00150 00160 YC.0002	Engineering B Engineering C Engineering D Engineering E Engineering F Production F Production B Production B Production B Production C Production C Production C Production F Production F Production G Finish AOR Programme - Ship 2	35 d 25 d 40 d 30 d 25 d 15 d 120 d 25 d 25 d 25 d 40 d 40 d 40 d 30 d 15 d 15 d 15 d 15 d 16 d 17 d 17 d 18 d 19 d 10 d 15 d 0 d 15 d 0 d 15 d 0 d 15 d 10 	22.01.24 22.01.24 22.01.24 18.03.24 18.03.24 29.04.24 20.05.24 24.06.24 24.06.24 24.06.24 19.08.24 19.08.24 14.10.24	23.02.24 15.03.24 26.04.24 19.04.24 17.05.24 01.11.24 21.06.24 26.07.24 16.08.24 16.08.24 11.10.24 27.09.24 01.11.24 13.12.24	2220-EB823, 2220-EB831 2220-EB823, 2220-EB847, 2220-EB831 2220-EB847 2220-EB823 2220-EB823 2220-EB823 2220-EB847 2220-EB847 2220-PGG16, 2220-PGG07 2220-PGG16, 2220-PGG07 2220-PGG07	937.5 1.800.0 900.0 750.0 225.0 13.725.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.0 1.500.
	00040 00050 00070 00080 PRO 00090 00100 00110 00110 00130 00130 00140 00150 00150 00150 VC.0002 PRO	Engineering B Engineering C Engineering D Engineering F Engineering G Production G Production A Production B Production B Production C Production C Production F Production F Production F Production F Production F	35 d 25 d 40 d 30 d 25 d 15 d 25 d 25 d 25 d 40 d 40 d 40 d 30 d 15 d 0	22.01.24 22.01.24 22.01.24 18.03.24 18.03.24 29.04.24 20.05.24 20.05.24 24.06.24 24.06.24 24.06.24 19.08.24 19.08.24 19.08.24 19.08.24 10.024	23.02.24 15.03.24 26.04.24 19.04.24 17.05.24 01.11.24 21.06.24 26.07.24 16.08.24 16.08.24 11.10.24 27.09.24 01.11.24	2220-EB823, 2220-EB831 2220-EB823, 2220-EB847, 2220-EB831 2220-EB847 2220-EB823 2220-EB823 2220-EB823 2220-EB847 2220-EB847 2220-PGG16, 2220-PGG07 2220-PGG16, 2220-PGG07 2220-PGG07	937. 1.800, 900, 750, 225, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.420, 1.475, 1.455,
	00040 00050 00070 00080 PRO 00090 00100 00110 00120 00130 00140 00150 00160 YC.0002 PRO 00100	Engineering B Engineering C Engineering D Engineering D Engineering E Engineering G Production Production B Production C Production C Production C Production F Production F Production F Production G Enish ADR Programme - Ship 2 Production Start	35 d 25 d 40 d 30 d 25 d 15 d 25 d 25 d 25 d 25 d 40 d 40 d 40 d 30 d 15 d 0 150 d 150 d 0	22.01.24 22.01.24 22.01.24 22.01.24 18.03.24 18.03.24 29.04.24 20.05.24 20.05.24 24.06.24 19.08.24 19.08.24 19.08.24 19.08.24 11.11.24 20.05.24 20.05.24	23.02.24 15.03.24 26.04.24 19.04.24 17.05.24 01.11.24 21.06.24 26.07.24 16.08.24 11.10.24 27.09.24 01.11.24 01.11.24 01.11.24 01.11.24 01.11.24	2220-EB823: 2220-EB831 2220-EB823: 2220-EB847: 2220-EB831 2220-EB847 2220-EB831 2220-EB847 2220-EB847 2220-PGG07 2220-PGG07 2220-PGG07 2220-PGG07 2220-PGG07	937. 1.800, 900, 750, 225, 1.500, 1.125, 1.500, 1.250, 1.500, 1.3725, 0, 1.3725, 1.500, 1.3725, 1.500, 1.3725, 1.500, 1.3725, 1.500, 1.3725, 1.500, 1.3725, 1.500, 1.3725, 1.500, 1.3725, 1.500, 1.3725, 1.500, 1.3725, 1.500, 1.3725, 1.500, 1.3725, 1.500, 1.3725, 1.500, 1.3725, 1.500, 1.3725, 1.500, 1.3725, 1.500, 1.3725, 1.500, 1.325, 1.500, 1.325, 1.500, 1.325, 1.500, 1.325,
]	00040 00050 00060 PRO 00090 00100 00100 00120 00120 00150 00150 00160 YC.0002 PRO 00010 00020	Engineering B Engineering C Engineering D Engineering F Engineering G Production G Production A Production B Production B Production D Production D Production F Production F Production F Production G Enrish AOR Programme - Ship 2 Production Start Production A	35 d 25 d 40 d 30 d 25 d 25 d 25 d 25 d 25 d 25 d 40 d 40 d 40 d 30 d 15 d 0 150 d 150 d 0 25 d	22.01.24 22.01.24 22.01.24 22.01.24 18.03.24 18.03.24 29.04.24 20.05.24 24.06.24 24.06.24 19.08.24 19.08.24 19.08.24 19.08.24 10.11.124 20.05.24 20.05.24 20.05.24 20.05.24 20.05.24	23.02.24 15.03.24 26.04.24 17.05.24 17.05.24 17.05.24 16.08.24 16.08.24 11.10.24 27.09.24 01.11.24 13.12.24 13.12.24 20.05.24	2220-EB823, 2220-EB831 2220-EB823, 2220-EB847, 2220-EB831 2220-EB847 2220-EB813 2220-EB823 2220-EB847 2220-PGG16, 2220-PGG07 2220-PGG16, 2220-PGG07 2220-PGG16 2220-PGG16 2220-PGG16	937. 1.800. 900. 750. 225. 1.500. 1.500. 1.125. 1.500. 3.600. 4.200. 1.350. 4.200. 1.350. 1.1475. 11.475. 0. 11.475. 0. 1.500. 1.5
1	00040 00050 00060 00070 00080 00100 00110 00120 00110 00150 00160 YC:0002 PRO 00160 YC:0002	Engineering B Engineering C Engineering D Engineering F Engineering G Production G Production A Production B Production D Production F Production F Production G Production G Production G Production G Production S Partielh AOR Programme - Ship 2 Production A Production A	35 d 25 d 40 d 30 d 25 d 15 d 120 d 25 d 25 d 25 d 40 d 40 d 40 d 40 d 30 d 15 d 150 d 150 d 15	22.01.24 22.01.24 22.01.24 22.01.24 18.03.24 18.03.24 29.04.24 20.05.24 20.05.24 24.06.24 24.06.24 24.06.24 19.08.24 19.08.24 19.08.24 19.08.24 20.05.24 20.05.24 20.05.24 20.05.24 20.05.24 20.05.24	23.02.24 15.03.24 26.04.24 13.04.24 17.05.24 01.11.24 21.06.24 16.08.24 11.10.24 27.09.24 01.11.24 13.12.24 13.12.24 13.12.24 22.05.24 26.07.24	2220-EB823: 2220-EB831 2220-EB823: 2220-EB847; 2220-EB831 2220-EB823 2220-EB823 2220-EB823 2220-EB847 2220-PGG16 2220-PGG07 2220-PGG07 2220-PGG16 2220-PGG16 2220-PGG16 2220-PGG16	937. 1.800, 900, 750, 225, 13.725, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.1475, 1.500, 1.500, 1.1475, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.500, 1.
	00040 00050 00060 00070 00090 00100 00100 00110 00120 00130 00140 00150 00150 00160 YC.0002 PRO 00101 00020 00010	Engineering B Engineering C Engineering D Engineering F Engineering F Production G Production R Production B Production C Production F Production F Production F Production F Production G Enrich ADR Programme - Ship 2 Production Start Production A Production A Production B Production A Production B	35 d 25 d 40 d 30 d 25 d 15 d 120 d 25 d 25 d 25 d 40 d 40 d 40 d 40 d 40 d 30 d 15 d 15 d 10 d 25 d 25 d 25 d 25 d 25 d 40 d 25 d 25 d 40 d 25 d 25 d 25 d 40 d 25 d 25 d 25 d 40 d 25 d 25 d 25 d 25 d 25 d 25 d 40 d 30 d 15 d 15 d 25 d 25 d 25 d 25 d 25 d 25 d 25 d 25 d 25 d 20 d	22 01 24 22 01 24 22 01 24 22 01 24 23 01 24 23 01 24 20 05 24 24 06 24 24 06 24 24 06 24 19 08 24 19 08 24 19 08 24 10 11 124 00 11 124 00 12 24 20 05 24 2	23.0224 15.0324 26.0424 19.0424 17.0524 01.11.24 21.0624 26.0724 16.0824 16.0824 16.0824 11.1024 27.0924 01.1124 13.1224 20.0524 20.0524 20.0524 23.0924	2220-EB823: 2220-EB831 2220-EB823: 2220-EB847: 2220-EB831 2220-EB847 2220-EB847 2220-EB847 2220-PGG016 2220-PGG07 2220-PGG07 2220-PGG07 2220-PGG05 2220-PGG07 2220-PGG16 2220-PGG16 2220-PGG16 2220-PGG16 2220-PGG16	937. 1.800, 900, 750, 225, 1.500, 1.500, 1.500, 3.600, 4.200, 1.550, 1.350, 1.475, 0, 1.475, 0, 1.500, 1.1.475, 0, 1.500, 1.1.475, 1.500, 1.1.475, 0, 1.500, 1.1.475, 1.500, 1.1.475, 1.500, 1.1.475, 1.500, 1.1.475, 1.500, 1.1.475, 1.500, 1.1.475, 1.500, 1.1.25, 1.500, 1.1.475, 1.500, 1
1	00040 00050 00060 PRO 00090 00100 00110 00120 00130 00140 VC.0002 PRO 00010 VC.0002	Ergineering B Engineering C Engineering D Engineering F Engineering G Production G Production A Production D Production D Production F Production F Production G Finish AOR Programme - Ship 2 Production Stat Production A Production A Production A Production B Production C	35 d 25 d 40 d 30 d 25 d 15 d 25 d 40 d 40 d 40 d 40 d 40 d 40 d 40 d 15 d 0 150 d 0 25 d 25 d 30 d 30 d 30 d 30 d 30 d	22.01.24 22.01.24 22.01.24 22.01.24 22.01.24 22.01.24 22.01.24 22.01.24 20.05.24 23.04.24 24.06.24 19.08.24 19.08.24 19.08.24 19.08.24 24.06.24 19.08.24	23.02.24 15.03.24 26.04.24 19.04.24 17.05.24 01.11.24 21.06.24 16.08.24 16.08.24 16.08.24 11.10.24 27.09.24 01.11.24 13.12.24 13.12.24 20.05.24 20.05.24 20.05.24 22.09.24	2220-EB823, 2220-EB831 2220-EB823, 2220-EB847, 2220-EB831 2220-EB847 2220-EB847 2220-EB847 2220-PGG16, 2220-PGG07 2220-PGG16, 2220-PGG07 2220-PGG16, 2220-PGG17 2220-PGG16 2220-PGG16 2220-PGG16 2220-PGG16 2220-PGG16, 2220-PGG07	937. 1.800, 900, 7500, 13.725, 1.500, 1.125, 1.500, 3.600, 4.200, 1.255, 1.500, 4.200, 1.3500, 4.500, 0, 1.3500, 1.3500, 1.3500, 1.
1	00040 00050 00060 00090 00090 00100 00110 00110 00130 00140 00150 00150 00160 YC.0002 PRO 00010 00010 00010 00010 00010	Engineering B Engineering C Engineering D Engineering F Engineering G Production A Production B Production B Production D Production F Production F Production G Production G Production G Production G Production S Production A Production A Production A Production A Production B Production C Production C Production C Production C	35 d 25 d 30 d 25 d 15 d 25 d 25 d 25 d 25 d 40 d 40 d 40 d 30 d 150 d 150 d 150 d 150 d 25 d 25 d 25 d 30 d	22 01 24 22 01 24 22 01 24 22 01 24 23 01 24 20 05 24 20 05 24 20 05 24 24 06 24 24 06 24 24 06 24 19 08 24 19 08 24 11 124 20 05 24 20 05	23 02 24 15 03 24 26 04 24 17 05 24 01 11 24 21 06 24 26 07 24 16 08 24 11 10 24 27 09 24 01 11 24 01 11 24 01 11 24 13 12 24 13 12 24 26 07 24 13 02 24 13 12 24 13 12 24 26 07 24 23 08 24 27 09 24 23 08 24 27 09 24 27 09 24 27 09 24 27 09 24	2220-EB823: 2220-EB831 2220-EB823: 2220-EB847: 2220-EB831 2220-EB823 2220-EB831 2220-EB831 2220-EB847 2220-PGG016 2220-PGG07 2220-PGG07 2220-PGG07 2220-PGG16 2220-PGG16 2220-PGG16 2220-PGG16 2220-PGG07 2220-PGG07 2220-PGG16 2220-PGG07 2220-PGG16 2220-PGG16 2220-PGG07 220-PGG07 220-PGG07	937. 1.800. 900. 750. 1.50
	00040 00050 00060 PRO 00090 00100 00100 00110 00120 00130 00140 00150 00150 00150 VC.0002 PRO 00010 VC.0002 PRO 00030 00030 00040	Engineering B Engineering C Engineering D Engineering D Engineering F Engineering F Production G Production A Production A Production C Production C Production G Finish AOR Programme - Ship 2 Production A Production A Production A Production A Production A Production C Production C Production C Production C Production C Production D Production C	35 d 25 d 40 d 30 d 25 d 15 d 25 d 25 d 40 d 40 d 40 d 40 d 30 d 15 d 0 150 d 150 d 150 d 150 d 30 d 30 d 25 d	22 01 24 22 01 24 22 01 24 22 01 24 23 01 24 23 01 24 20 05 24 24 06 24 24 06 24 24 06 24 24 06 24 19 08 24 19 08 24 19 108 24 10 11 12 20 05 24 20 05 24 21 06 24 21 06 24 21 07 24 20 05 24 21 06 24 21 07 24 20 05 24 21 06 24 21 07 24 20 05 24 21 07 24 210 07 24 21 07 24 2	23 02 24 15 03 24 26 04 24 19 04 24 17 05 24 01 11 24 21 06 24 26 07 24 26 07 24 26 07 24 26 07 24 27 09 24 01 11 24 13 12 24 13 12 24 26 07 24 23 06 24 27 09 24 29 11 24	2220-EB823 2220-EB831 2220-EB823 2220-EB847; 2220-EB831 2220-EB847 2220-EB847 2220-EB847 2220-EB847 2220-EB847 2220-PGG016, 2220-PGG07 2220-PGG16, 2220-PGG07 2220-PGG16 2220-PGG16 2220-PGG16 2220-PGG16 2220-PGG16 2220-PGG16, 2220-PGG07 2220-PGG16, 2220-PGG07	937,5 1.800,0 900,0 750,0,0 1.225,0 1.500,0 1.125,0 1.500,0 1.350,0 1.350,0 1.350,0 1.350,0 1.475,0 0,0 1.1475,0 0,0 1.125
	00040 00050 00060 00090 00090 00100 00110 00110 00130 00140 00150 00150 00160 YC.0002 PRO 00010 00010 00010 00010 00010	Engineering B Engineering C Engineering D Engineering F Engineering G Production A Production B Production B Production D Production F Production F Production G Production G Production G Production G Production S Production A Production A Production A Production A Production B Production C Production C Production C Production C	35 d 25 d 30 d 25 d 15 d 25 d 25 d 25 d 25 d 40 d 40 d 40 d 30 d 150 d 150 d 150 d 150 d 25 d 25 d 25 d 30 d	22 01 24 22 01 24 22 01 24 22 01 24 23 01 24 20 05 24 20 05 24 20 05 24 24 06 24 24 06 24 24 06 24 19 08 24 19 08 24 11 124 20 05 24 20 05	23 02 24 15 03 24 26 04 24 17 05 24 01 11 24 21 06 24 26 07 24 16 08 24 11 10 24 27 09 24 01 11 24 01 11 24 01 11 24 13 12 24 13 12 24 26 07 24 13 02 24 13 12 24 13 12 24 26 07 24 23 08 24 27 09 24 23 08 24 27 09 24 27 09 24 27 09 24 27 09 24	2220-EB823: 2220-EB831 2220-EB823: 2220-EB847: 2220-EB831 2220-EB823 2220-EB831 2220-EB831 2220-EB847 2220-PGG016 2220-PGG07 2220-PGG07 2220-PGG07 2220-PGG16 2220-PGG16 2220-PGG16 2220-PGG16 2220-PGG07 2220-PGG07 2220-PGG16 2220-PGG07 2220-PGG16 2220-PGG16 2220-PGG07 220-PGG07 220-PGG07	937,5 1.800,0 900,0 750,0,0 1.500,0

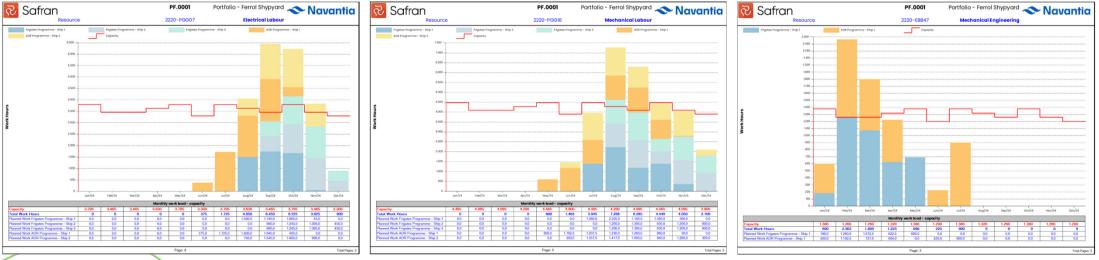


A Project Group allows to define the necessary relationships between Projects, but this is not enough for guarantee a feasible execution: Resources are limited and shared

2. Project Groups: analysis of load-capacity from multiple projects using shared resources



Histograms reflecting the current planned load of work for each productive resource (bars, differenciating the load in the different Projects), and the capacity of each resource (red line)

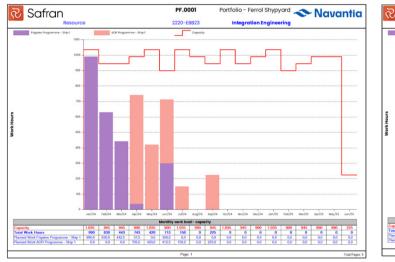


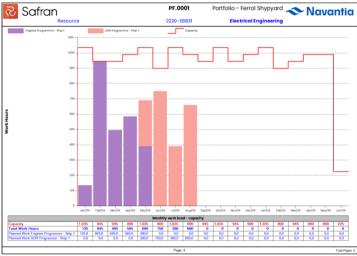
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2. Project Groups: analysis of load-capacity from multiple projects using shared resources

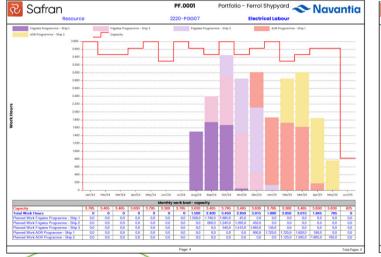
	ctivity ID	Description	Duration	Early Start	Early Finish	Early Start Leveled	Early Finish Leveled	Resources	Planned	12024 - 1202 Walan Feb Mar ker May Lun Lui kua Eseo Dat Nov Dec Lian Feb Mar ker May Lun
-	F.0001	Portfolio - Shipyard Ferrol		01.01.24	27.12.24	01.01.24	06.06.25		70.462,5	
	JB.0001	Frigates Programme - Ship 1	230 d	01.01.24	15.11.24	01.01.24	15.11.24		20.250,0	
8	ENG	Engineering	130 d	01.01.24	28.06.24	01.01.24	28.06.24		8.775,0	
	00001	Start	0	01.01.24	01.01.24	01.01.24	01.01.24		0.0	Resource levelling distributes
	00010	Engineering A	20 d 40 d	01.01.24 29.01.24	26.01.24	01.01.24 29.01.24	26.01.24	2220-EBB23 2220-EBB23: 2220-EBB47	900.0 2.100.0	
	00020	Engineering C	30 d	29.01.24	08.03.24	29.01.24	08.03.24	2220-EBB23: 2220-EBB31	1.125.0	the activities according to the
	00040	Engineering D	50 d	29.01.24	05.04.24	29.01.24	05.04.24	2220-EBB23: 2220-EBB47; 2220-EBB31	2.250.0	
	00050	Engineering E	40 d	08.04.24	31.05.24	08.04.24	31.05.24	2220-EBB47	1.200,0	priority criteria established,
	00060	Engineering F	30 d	08.04.24	17.05.24	08.04.24		2220-EBB31	900.0	phonty chiena established,
	00070	Engineering G	20 d	03.06.24	28.06.24	03.06.24	28.06.24	2220-EBB23	300.0 11.475,0	
	00080	Production A	25 d	01.07.24	02.08.24	01.07.24	02.08.24	2220-PGG16	1.500.0	avoiding overload of
	00090	Production B	20 d	05.08.24	30.08.24	05.08.24	30.08.24	2220-PGG16	1.050,0	
	00100	Production C	30 d	05.08.24	13.09.24	05.08.24	13.09.24	2220-PGG07	1.125,0	
	00110	Production D	30 d	05.08.24	13.09.24	05.08.24	13.09.24	2220-PGG16; 2220-PGG07	2.700,0	
	00120	Production E	35 d	16.09.24	01.11.24	16.09.24	01.11.24	2220-PGG16; 2220-PGG07	3.675.0	Deviations from the "logic"
	00130	Production F Production G	25 d	16.09.24	18.10.24	16.09.24	18.10.24	2220PGG07 2220.PGG16	1.125,0 300,0	
	00150	Finish	0	15.11.24	15.11.24	15.11.24	15.11.24		0.0	
•	JB.0002	Frigates Programme - Ship 2	130 d	01.07.24	27.12.24	01.07.24	27.12.24	i i	9.075,0	plan are useful for a first
=	PRO	Production	130 d	01.07.24	27.12.24	01.07.24	27.12.24		9.075,0	
	00010	Start Production A	0	01.07.24	01.07.24	01.07.24	01.07.24	2220.89616	0.0	reference, and for making
	00020	Production A Production B	20 d	02.09.24	30.08.24	02.09.24		2220-PGG16	900.0	
	00040	Production C	25 d	16.09.24	18.10.24	16.09.24	18.10.24	2220-PGG07	750,0	
	00050	Production D	25 d	16.09.24	18.10.24	16.09.24		2220-PGG07; 2220-PGG16	1.875.0	decisions like subcontracting,
	00060	Production E	30 d	04.11.24	13.12.24	04.11.24		2220-PGG16; 2220-PGG07	3.150,0	
	00070	Production F Production G	20 d	21.10.24	15.11.24 27.12.24	21.10.24	15.11.24 27.12.24	2220-PGG07 2220-PGG16	900,0 300,0	assumings delays, optimize
	00080	Production G Enish	0	27.12.24	27.12.24	27.12.24	27.12.24	2220493316	300,0	
-	JB.0003	Frigates Programme - Ship 3	130 d	01.07.24	27.12.24	01.07.24	17.01.25		9.075,0	work sequences
-	PRO	Production	130 d	01.07.24	27.12.24	01.07.24	17.01.25		9.075,0	Work Sequences
	00010	Start	0	01.07.24	01.07.24	01.07.24	01.07.24		0.0	
	00020	Production A	20 d	05.08.24 02.09.24	30.08.24 20.09.24	23.09.24 21.10.24	18.10.24	2220-PGG16	1.200,0 900,0	
	00030	Production B Production C	25 d	16.09.24	18.10.24	21.10.24	22.11.24	2220-PGG16 2220-PGG07	750.0	
	00050	Production D	25 d	16.09.24	18.10.24	21.10.24		2220-PGG07; 2220-PGG16	1.875,0	
	00060	Production E	30 d	04.11.24	13.12.24	25.11.24		2220-PGG16; 2220-PGG07	3.150,0	
	00070	Production F	20 d	21.10.24	15.11.24	25.11.24	20.12.24	2220-PGG07	900,0	
	00080	Production G	10 d	16.12.24	27.12.24	06.01.25	17.01.25	2220-PGG16	300.0	
	YC.0000	AOR Programme	250 d	01.01.24	13.12.24	01.01.23	06.06.25		32.062.5	
-	YC.0001	AOR Programme Ship 1	220 d	01.01.24	01.11.24	01.01.24	25.04.25		20.587,5	
-	ENG	Engineering	100 d	01.01.24	17.05.24	01.01.24	27.09.24		6.862,5	
	00010	Start	0 15 d	01.01.24	01.01.24	01.01.24	01.01.24	2220-EBB23	0.0 675,0	
	00020	Engineering A Engineering B	35 d	22.01.24	08.03.24	29.04.24		2220-EBB23 2220-EBB47	1,575.0	
	00040	Engineering C	25 d	22.01.24	23.02.24	20.05.24		2220-EBB23; 2220-EBB31	937,5	
	00050	Engineering D	40 d	22.01.24	15.03.24	03.06.24	26.07.24	2220-EBB23: 2220-EBB47; 2220-EBB31	1.800,0	
	00060	Engineering E	30 d	18.03.24	26.04.24	29.07.24	06.09.24	2220-EBB47	900.0	
	00070	Engineering F Engineering G	25 d	18.03.24 29.04.24	19.04.24	29.07.24	30.08.24	2220-EBB31 2220-EBB23	750.0 225.0	
	PRO	Production	120 d	20.05.24	01.11.24	11.11.24	25.04.25	2220'00023	13.725,0	
	00090	Production A	25 d	20.05.24	21.06.24	11.11.24	13.12.24	2220-PGG16	1.500.0	
	00100	Production B	25 d	24.06.24	26.07.24	16.12.24		2220-EBB47	1.125,0	
	00110	Production C	40 d	24.06.24	16.08.24	16.12.24		2220-PGG07	1.500,0	
	00120	Production D	40 d	24.06.24	16.08.24	16.12.24	07.02.25	2220-PGG16; 2220-PGG07 2220-PGG16; 2220-PGG07	3.600,0 4.200,0	
	00130	Production E	40 d	19.08.24	27.09.24	10.02.25		2220-PGG07	1.350.0	
	00150	Production G	15 d	14.10.24	01.11.24	07.04.25	25.04.25	2220-PGG16	450.0	
	00160	Rnish	0	01.11.24	01.11.24	25.04.25	25.04.25		0.0	
=	YC.0002	AOR Programme - Ship 2	150 d	20.05.24	13.12.24	30.09.24	06.06.25		11.475,0	
-	PRO	Production	150 d	20.05.24	13.12.24	30.09.24	06.06.25		11.475,0	
	00010	Start Production A	0 25 d	20.05.24	20.05.24	30.09.24	30.09.24	2220-PGG16	0.0	
	00020	Production B	20 d	29.07.24	23.08.24	03.02.25	01.01.00	2220-PGG16	1.050.0	
	00040	Production C	30 d	19.08.24	27.09.24	10.02.25		2220-PGG07	1.125.0	
	00050	Production D	30 d	19.08.24	27.09.24	10.02.25	21.03.25	2220-PGG16; 2220-PGG07	2.700.0	
	00060	Production E	35 d	14.10.24	29.11.24	07.04.25		2220-PGG16; 2220-PGG07	3.675.0	
	00070	Production F Production G	25 d	30.09.24	01.11.24	24.03.25 26.05.25		2220-PGG07 2220-PGG16	1.125,0 300.0	
	08000	Finish	0	02.12.24	13.12.24	26.05.25	06.06.25	22207'0010	300,0	
					10.16.6.4					
			_							
	Resource Level	ed (Live) Early Production	Early E	ingineering	Finish Miest	ione 📜 Start	Miestone			Number of activities 159 Row 16 to 74

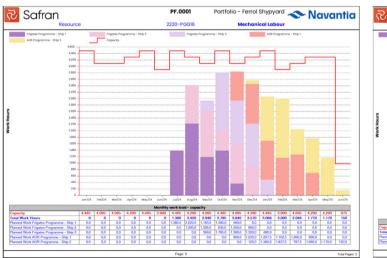
2. Project Groups: analysis of load-capacity from multiple projects using shared resources

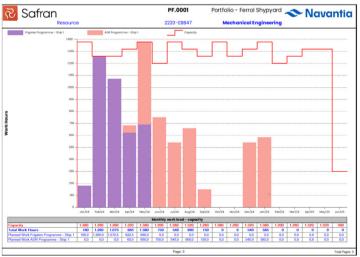




Same histograms, using the levelled dates for distributing the work load.



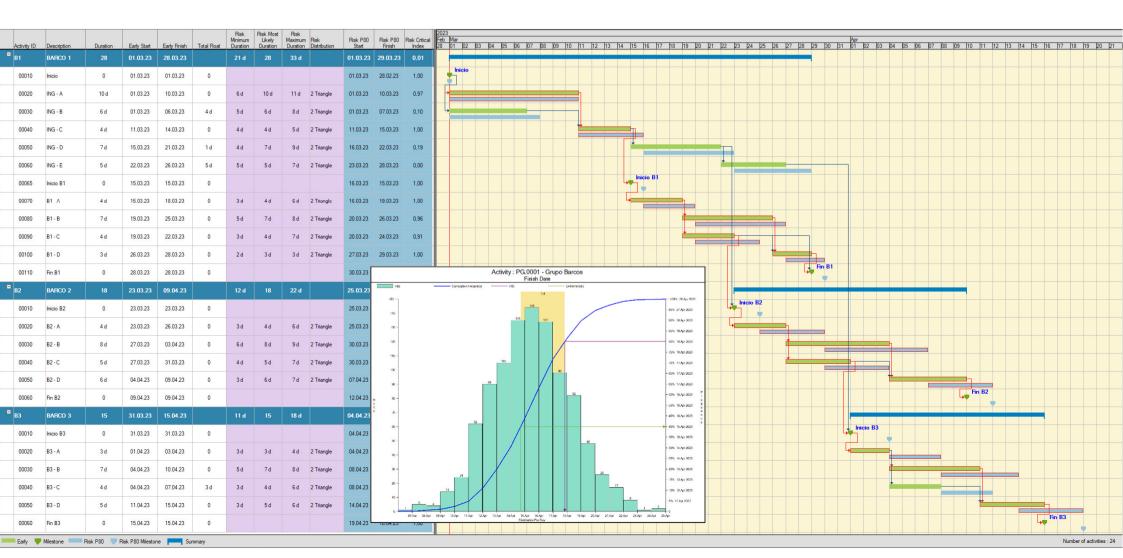




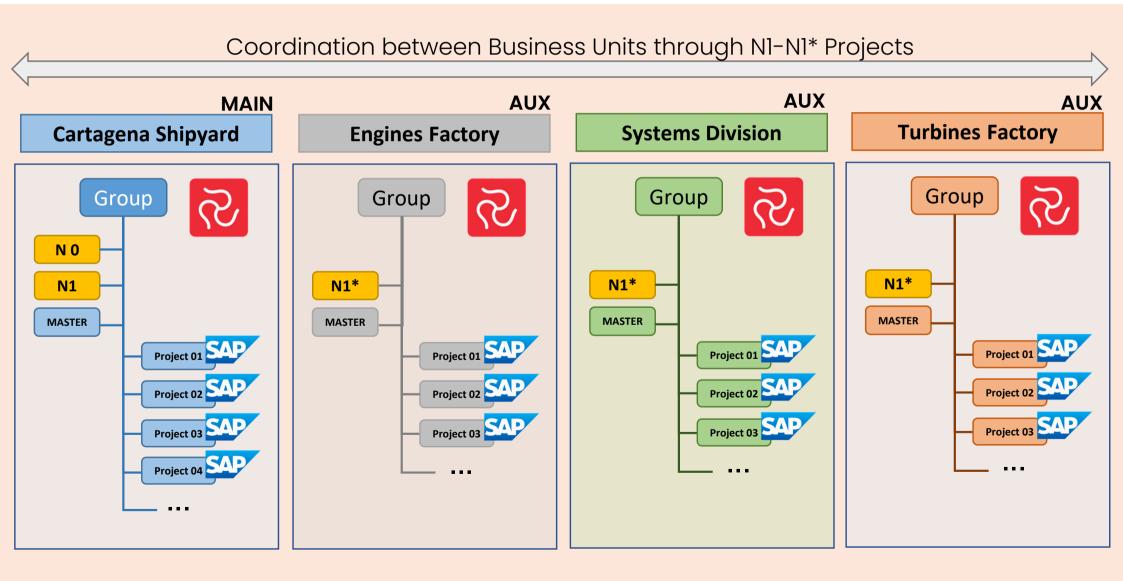
21

2. Project Groups: Monte Carlo, Critical Path Analysis... at Programme level

The tools



3. Database automations: Integrated Programme Planning (II)

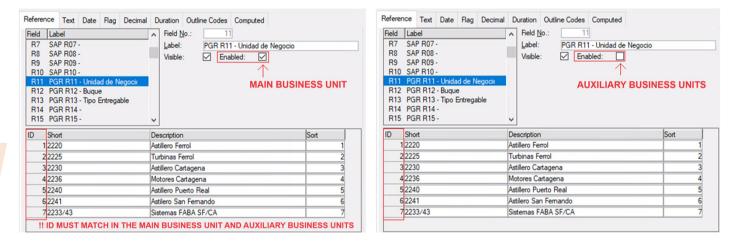


3. Database automations: Integrated Programme Planning (II)

The tools

From N1, the main BU selects in a reference userfield which aux. BU to coordinate a milestone with

A database automation is run daily, transfering data from N1 to each N1*and vice versa



In the N1* project of each auxiliary BU, the corresponding milestones will be generated, inheriting some data from the main BU (ref. date, type, vessel, purchase code, comment...)

Each auxiliary BU links the milestones to the detail projects in their Project Groups as corresponds, so the date will depend on their schedule. This date, and other data will be returned to the Project NI of the main BU

Having the "need" date of the main BU in one userfield, and the "forecast" delivery date of the auxiliary BUs in another userfield, they can be compared for detecting delays, confirming deliveries...

Several userfields from different types are reserved for Programme coordination between Business Units, they must be configured properly

3. Database automations: Integrated Programme Planning (II)

					2022 Aug Oct De	2023	2024					2029
Description Submarino S82	Fecha Local	Fecha Externa	Retraso Entrega Yes	Hito Completado	Aug Oct De	ec Feb Aor Jun Aua Oct De	ec Feb Apr Jun Aug Oct De	ec Feb Apr Jun Aug Oct De	c Feb Apr Jun Aug Oct D	ec Feb Apr Jun Aug Oct De	ec Feb Apr Jun Aug Oct De	ec Feb Apr Jur
										· ·		
Astillero Cartagena			No							A corporativ	e Layout has	S _
Referencia de UN Principal	18.11.22	26.03.26	No							been prepa	red, so	
Milestone 1	18.11.22	18.11.22	No	Yes	1					evervbody s	sees the sam	ne,
Milestone 2	06.06.23	06.06.23	No	Yes		1				independen	ntly if they are	, ,
Milestone 3	07.02.24	07.02.24	No	No			*			looking from NI or one of the		
Milestone 4	13.02.24	13.02.24	No	No			*			N1* projects (N1* projects will		
Milestone 5	11.02.25	11.02.25	No	No				*		not display milestones from		
Milestone 6	14.07.25	14.07.25	No	No				*		other aux. Bl		OITI
Milestone 7	26.03.26	26.03.26	No	No					*	Other dux. B)	
Sistemas FABA SF/CA			Yes							-		
Equipos - Sistemas - Software	01.10.23	10.02.27	Yes									
Milestone 23	01.10.23	02.10.23	No	Yes		1						
Milestone 24	01.10.23	16.10.23	No	Yes		4						
Milestone 25	15.10.23	16.10.23	No	Yes		1						
Milestone 26	14.01.24	13.06.24	No	No			* *					
Milestone 27	22.06.24	25.11.24	No	No			× *					
Milestone 28	10.05.24	29.11.24	No	No			× *					
Milestone 29	19.11.24	29.11.24	No	No			N					
Milestone 30	14.07.25	06.06.25	Yes	No				*₩				
Milestone 31	14.02.25	10.07.25	No	No				* *				
Milestone 32	03.07.26	11.02.26	Yes	No					*			
Milestone 33	31.01.27	10.02.27	No	No						N		
Documentación	29.10.23	19.03.25	No									
* Pruebas	28.09.23	11.03.25	No									
Trabajos in-situ	15.11.23	15.11.23	No			1						
Submarino S83			No			-						
Astillero Cartagena			No									
Sistemas FABA SF/CA			No			-						
■ Submarino S84			No									
📁 Entrega Prevista 📁 Entrega Prevista Retraso 🛛 🛒 Entrega Complet	ta 🔶 Necesidad											

3. Database automations: automated reports by e-mail

[Safran Project] Proyectos Eva Vázquez - Incidencias en la Planificació	n (2023.10	0.23)							
Comunicaciones Safran Project <comunicaciones_ To • jvarela@navantia.es Cc • Borges, Jorge</comunicaciones_ 	Reply	$\gamma \iff$ Reply All \rightarrow Fo	mward 000 Mon 23/10/20	23 13:39					
(i) If there are problems with how this message is displayed, click here to view it in a web browser.	1	А	В	(С	D	E F		G
		Incidencia	Project Nan	ne WBS - F1	Activit	ty ID Description	Lenght Desc	ription To	-
EvaVazquez_incidenciasPlanificacion_2023.10.23.csv v									
027 KD		[Check 02] Total Float > 150	FB.8728	FB.8728.N.	A.BCO.002 15623	30-0100 Activity 01		22	449
		[Check 02] Total Float > 150	FB.8728	FB.8728.N.	A.BCO.002 15623	30-0110 Activity 02		28	449
Hola.		[Check 02] Total Float > 150		FB.8728.N.	A.BCO.002 15623	30-0120 Activity 03		29	449
		[Check 02] Total Float > 150		FB.8728.N.		30-0130 Activity 04		20	449
Se ha generado el informe "Proyectos Eva Vázquez - Incidencias en la Planificación" a fecha 2023.10.23.		[Check 02] Total Float > 150				30-0140 Activity 05		34	449
Se envía adjunto el resultado de su ejecución y, a continuación, un listado con el número de incidencias de	e cada tipo.	[Check 02] Total Float > 150				30-0150 Activity 06		27	449
		[Check 02] Total Float > 150				30-0160 Activity 07		30	453
Proyectos Eva Vázquez - Incidencias en la Planificación		0 [Check 02] Total Float > 150		FB.8728.N.		30-0170 Activity 08		27	449
Proyectos Eva vazquez - incidencias en la Planificación		1 [Check 02] Total Float > 150		FB.8728.N.		30-0180 Activity 09		24	453
Incidencia	Nº de Acti	2 [Check 02] Total Float > 150 3 [Check 02] Total Float > 150			A.BCO.002 15642	20-0030 Activity 10 20-0040 Activity 11		16 18	2502 2509
[Check 01] Total Float negativo [Check 02] Total Float > 150		0							
[Check 03] Fechas Early anteriores al Timenow		411			•	group of p			
[Check 04] Restricciones "duras"		739		planning manager receives a weekly customized report by e-mail					
[Check 05.1] Out of Sequence		144		autor	natically	, extracting	g data from		
[Check 07.2] Sin Calendario o con Calendario diferente al 10		0					ding to the ley want to		
[Check 09] Descripción de más de 40 caracteres		0		check					
[Check 11] Descripción "ANULAD@" sin "No Existente"		0							



3. Database automations: different operations in userfields and standard fields, not possible using formulas from the application. Some examples:

The recently "All predecessors completed" (with some variations) was automated in a flag userfield

After each integration from SAP to Safran, a database automation adjusts the progress of non-SAP resources (used sometimes exclusively in Safran for particular levelings), so when executing an Status Update, the aggregated progress depends only on SAP resources

Another automation calculates the agreggated cost progress at activity level in an userfield, based on each resource progress and the cost budget (since the application only calculates the progress based on gty)

Some flags are automated for identifying activities with some particularities, which are not easy or not possible to identify using standard filters such as activities with at least one SS/FF/SF link with a successor, activities with inconsistent progress and actuals, activities having resources integrated from SAP without budget...

Limitations: these automations are executed periodically (daily, weekly...) or triggered by an integration SAP – Safran, so they don't respond to changes in the schedule, and it is necessary to execute them manually for an immediate update, or wait.



