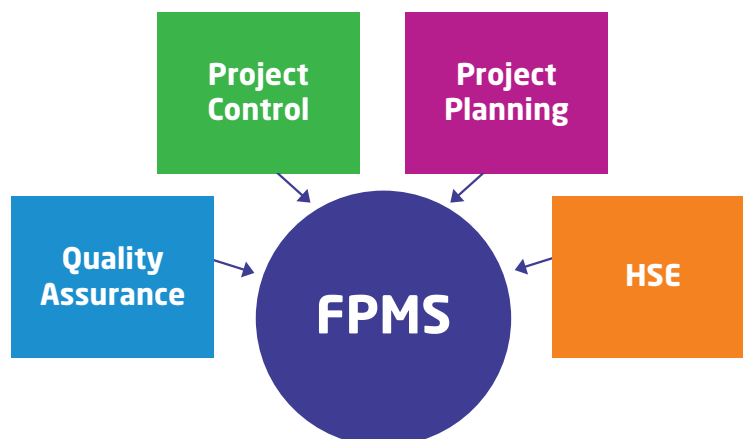


FPMS A PROVEN WORKFORCE METHODOLOGY

CASE 755: ExxonMobil's High Pressure Hydrotreater Project leverages FPMS on complex process modules

Cofely Fabricom utilizes a unique project management system **FPMS** (Fabricom Project Management System). FPMS is a proactive tool leveraged to achieve execution excellence. Based on 25 years of experience, FPMS is tailor-made for Cofely Fabricom and used to manage and steer its projects for the past two decades across the globe.

FPMS is a fully integrated planning tool for HSE, Quality, Planning, Scheduling and Project Control systems that covers all core trades - welding, piping, mechanical, electrical and instrumentation activities, painting, insulation and more. FPMS executes an overall cost reduction methodology into each Cofely Fabricom project.



FPMS is a material driven system which manages modular assembly , and allows constant real-time project control over each project's entire lifecycle, from the initial field engineering phase to the final mechanical completion (see diagram below). All the data related to each project is provided in real-time, consolidated and made readily available to all project stakeholders, offering cost reduction opportunities at each stage of the project.

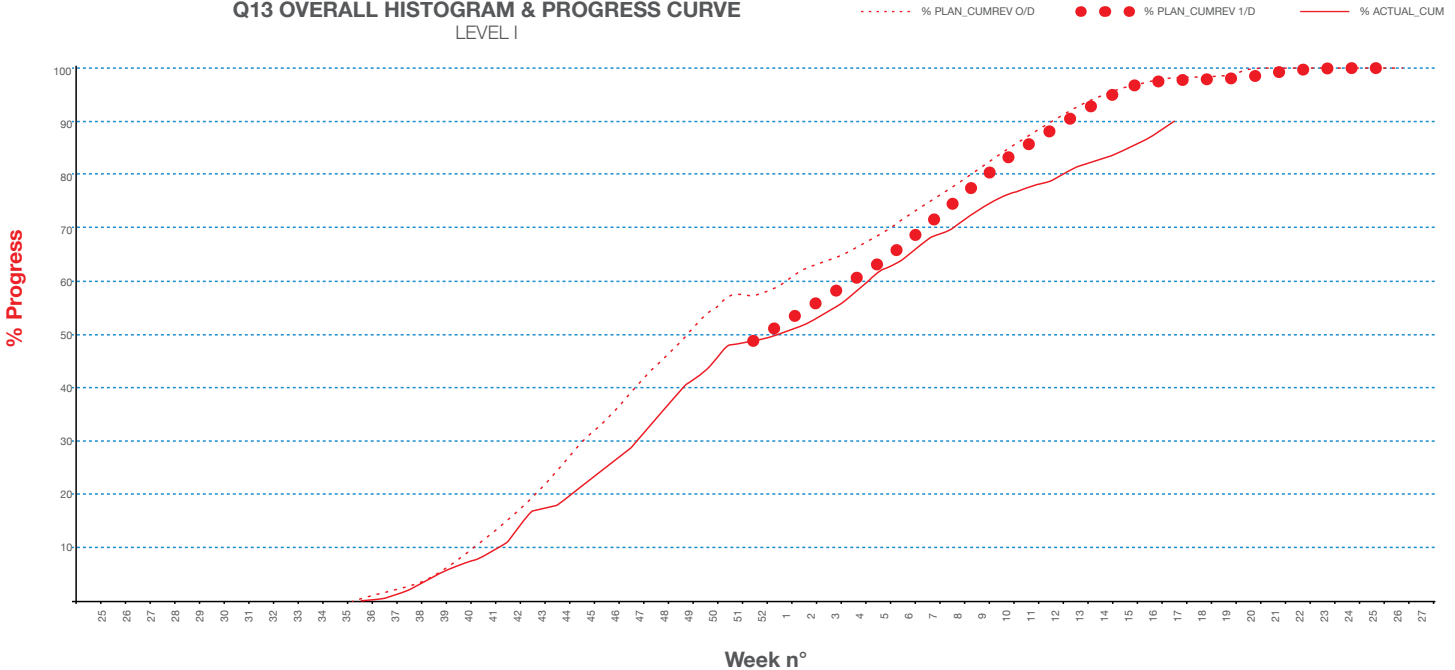


FPMS will generate a weekly and monthly progress report during the entire duration of each project outlining actual progress in comparison to the initial progress schedule identifying delays and opportunities for increased focus.



Graph 1: Overall Histogram and Progress Curve - Example

REV 1/D - 30/12/2012
Q13 OVERALL HISTOGRAM & PROGRESS CURVE
 LEVEL I



WEEK NO.	WEEK STARTING	% PLAN_CUMREV O/D	% PLAN_CUMREV 1/D	% ACTUAL_CUM	% ACTUAL_INC	% DELTA_CUMREV 1/D	% DELTA_INC REV 1/D
25	18-06-2012						
26	25-06-2012	0.00	0.00	0.00	0.00		
27	02-07-2012	0.00	0.00	0.00	0.00		
28	09-07-2012	0.00	0.00	0.00	0.00		
29	16-07-2012	0.00	0.00	0.00	0.00		
30	23-07-2012	0.00	0.00	0.00	0.00		
31	30-07-2012	0.00	0.00	0.00	0.00		
32	06-08-2012	0.00	0.00	0.00	0.00		
33	13-08-2012	0.00	0.00	0.00	0.00		
34	20-08-2012	0.00	0.00	0.00	0.00		
35	27-08-2012	0.00	0.00	0.00	0.00		
36	03-09-2012	0.29	0.29	0.29	0.29		
37	10-09-2012	1.57	1.28	0.75	0.75	2.16	1.42
38	17-09-2012	2.85	1.28	2.16	1.42	4.66	2.49
39	24-09-2012	4.83	1.98	4.66	2.49	6.68	2.02
40	01-10-2012	7.69	2.86	8.35	1.67	11.09	2.74
41	08-10-2012	11.36	3.67	16.64	5.55	18.05	1.41
42	15-10-2012	14.98	3.62	25.14	3.63	21.51	3.46
43	22-10-2012	19.53	4.55	28.64	3.50	25.14	3.63
44	29-10-2012	24.03	4.50	34.44	5.80	39.69	5.25
45	05-11-2012	29.57	5.84	43.26	3.57	47.78	4.52
46	12-11-2012	34.08	4.20	49.03	1.25	51.89	1.97
47	19-11-2012	39.32	5.24	54.53	2.84	57.61	3.08
48	26-11-2012	44.15	4.83	60.40	2.33	64.01	2.33
49	03-12-2012	49.48	4.54	67.38	3.98	70.12	2.13
50	10-12-2012	53.45	4.76	74.26	3.78	73.30	3.18
51	17-12-2012	57.37	3.92	81.10	2.35	82.99	1.89
52	24-12-2012	57.37	0.00	88.22	2.72	89.94	2.98
1	31-12-2012	58.11	1.75	94.70	2.19	98.36	0.10
2	07-01-2013	62.03	2.92	98.36	0.00	100.00	0.00
3	14-01-2013	64.03	2.00	99.71	1.34	100.00	0.00
4	21-01-2013	65.94	1.91	100.00	0.00	100.00	0.00
5	28-01-2013	68.67	2.73	100.00	0.00	100.00	0.00
6	04-02-2013	71.70	3.03	100.00	0.00	100.00	0.00
7	11-02-2013	74.81	3.11	100.00	0.00	100.00	0.00
8	18-02-2013	77.60	2.78	100.00	0.00	100.00	0.00
9	25-02-2013	80.90	3.30	100.00	0.00	100.00	0.00
10	04-03-2013	84.02	3.12	100.00	0.00	100.00	0.00
11	11-03-2013	86.87	2.86	100.00	0.00	100.00	0.00
12	18-03-2013	89.76	2.89	100.00	0.00	100.00	0.00
13	25-03-2013	92.51	2.75	100.00	0.00	100.00	0.00
14	01-04-2013	94.70	2.19	100.00	0.00	100.00	0.00
15	08-04-2013	96.35	1.66	100.00	0.00	100.00	0.00
16	15-04-2013	97.19	0.83	100.00	0.00	100.00	0.00
17	22-04-2013	98.26	1.07	100.00	0.00	100.00	0.00
18	29-04-2013	98.36	0.10	100.00	0.00	100.00	0.00
19	06-05-2013	98.36	0.00	100.00	0.00	100.00	0.00
20	13-05-2013	99.71	1.34	100.00	0.00	100.00	0.00
21	20-05-2013	100.00	0.29	100.00	0.00	100.00	0.00
22	27-05-2013	100.00	0.00	100.00	0.00	100.00	0.00
23	03-06-2013	100.00	0.00	100.00	0.00	100.00	0.00
24	10-03-2013	100.00	0.00	100.00	0.00	100.00	0.00
25	17-03-2013	100.00	0.00	100.00	0.00	100.00	0.00
26	24-06-2013	100.00	0.00	100.00	0.00	100.00	0.00
27	04/4/2014						

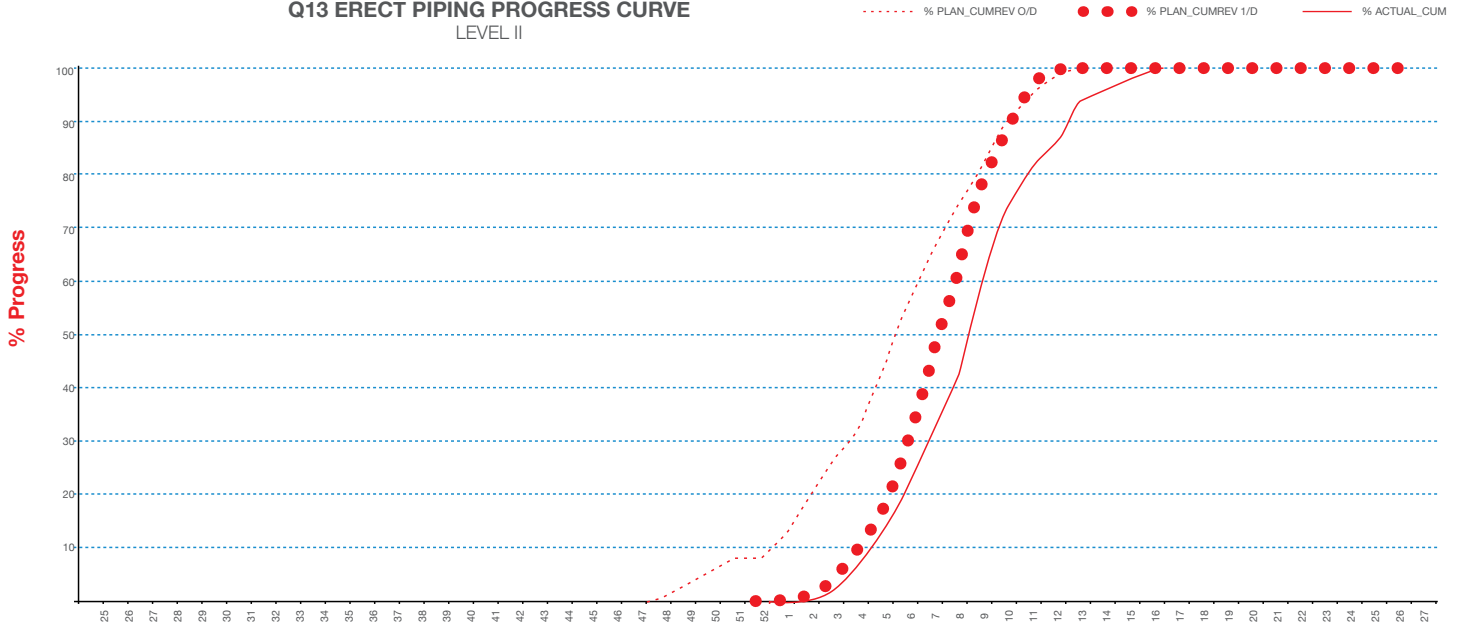
If delays are identified in the overall project progress, the cause of these delays can be easily found as FPMS breaks out the analysis in detail per trade and per discipline as illustrated in graphic 2.

It is common practice in the industry to react to deviation by directly increasing the number of man-hours allocated to a project, thus generating additional costs for the client, although adding man-hours may not always constitute the best solution.

As a matter of fact, deviations may also be caused by material or engineering shortages/deficiencies (e.g.: delays in material delivery, revisions made to initial engineering).

Graphic 2 below: Erect Piping Progress Curve - Example

REV 1/D - 30/12/2012
Q13 ERECT PIPING PROGRESS CURVE
 LEVEL II



WEEK NO.	WEEK STARTING	% PLAN_CUMREV O/D	% PLAN_CUMREV 1/D	% ACTUAL_CUM	% ACTUAL_INC	% DELTA_CUMREV 1/D	% DELTA_INC REV 1/D
25	18-06-2012	0.00	0.00	0.00	0.00	0.00	
26	25-06-2012	0.00	0.00	0.00	0.00	0.00	
27	02-07-2012	0.00	0.00	0.00	0.00	0.00	
28	09-07-2012	0.00	0.00	0.00	0.00	0.00	
29	16-07-2012	0.00	0.00	0.00	0.00	0.00	
30	23-07-2012	0.00	0.00	0.00	0.00	0.00	
31	30-07-2012	0.00	0.00	0.00	0.00	0.00	
32	06-08-2012	0.00	0.00	0.00	0.00	0.00	
33	13-08-2012	0.00	0.00	0.00	0.00	0.00	
34	20-08-2012	0.00	0.00	0.00	0.00	0.00	
35	27-08-2012	0.00	0.00	0.00	0.00	0.00	
36	03-09-2012	0.00	0.00	0.00	0.00	0.00	
37	10-09-2012	0.00	0.00	0.00	0.00	0.00	
38	17-09-2012	0.00	0.00	0.00	0.00	0.00	
39	24-09-2012	0.00	0.00	0.00	0.00	0.00	
40	01-10-2012	0.00	0.00	0.00	0.00	0.00	
41	08-10-2012	0.00	0.00	0.00	0.00	0.00	
42	15-10-2012	0.00	0.00	0.00	0.00	0.00	
43	22-10-2012	0.00	0.00	0.00	0.00	0.00	
44	29-10-2012	0.00	0.00	0.00	0.00	0.00	
45	05-11-2012	0.00	0.00	0.00	0.00	0.00	
46	12-11-2012	0.00	0.00	0.00	0.00	0.00	
47	19-11-2012	0.00	0.00	0.00	0.00	0.00	
48	26-11-2012	0.50	0.50	0.00	0.00	0.00	
49	03-12-2012	2.99	2.49	0.00	0.00	0.00	
50	10-12-2012	5.47	2.48	0.00	0.00	0.00	
51	17-12-2012	7.87	2.49	0.00	0.00	0.00	
52	24-12-2012	7.97	0.00	0.00	0.00	0.00	
1	31-12-2012	12.27	4.31	0.00	0.00	0.00	0.00
2	07-01-2013	19.45	7.18	1.28	0.37	0.37	-0.92
3	14-01-2013	26.63	7.18	3.42	2.13	1.84	-1.57
4	21-01-2013	32.39	5.76	9.81	6.40	6.98	5.14
5	28-01-2013	43.35	10.96	17.54	7.73	14.00	7.03
6	04-02-2013	56.02	12.68	30.47	12.83	21.93	7.93
7	11-02-2013	65.88	9.85	44.83	14.36	32.16	10.22
8	18-02-2013	73.86	7.99	61.92	17.09	42.08	9.92
9	25-02-2013	81.27	7.41	78.79	16.87	58.82	17.54
10	04-03-2013	88.79	6.52	88.77	9.99	73.06	13.45
11	11-03-2013	94.80	5.11	96.58	7.81	81.55	8.49
12	18-03-2013	99.70	3.80	99.14	2.56	85.95	4.39
13	25-03-2013	100.00	1.30	100.00	0.86	93.32	7.38
14	01-04-2013	100.00	0.00	100.00	0.00	96.15	2.82
15	08-04-2013	100.00	0.00	100.00	0.00	97.91	1.77
16	15-04-2013	100.00	0.00	100.00	0.00	99.70	1.79
17	22-04-2013	100.00	0.00	100.00	0.00	100.00	0.00
18	29-04-2013	100.00	0.00	100.00	0.00	100.00	0.00
19	06-05-2013	100.00	0.00	100.00	0.00	100.00	0.00
20	13-05-2013	100.00	0.00	100.00	0.00	100.00	0.00
21	20-05-2013	100.00	0.00	100.00	0.00	100.00	0.00
22	27-05-2013	100.00	0.00	100.00	0.00	100.00	0.00
23	03-06-2013	100.00	0.00	100.00	0.00	100.00	0.00
24	10-06-2013	100.00	0.00	100.00	0.00	100.00	0.00
25	17-06-2013	100.00	0.00	100.00	0.00	100.00	0.00
26	24-06-2013	100.00	0.00	100.00	0.00	100.00	0.00
27	01-07-2014	100.00	0.00	100.00	0.00	100.00	0.00

FPMS provides a unique focus

FPMS rapidly notifies Cofely Fabricom teams of any workface plan deviations, identifying root causes and enabling teams to react quickly and adjust plans to correct budget or schedule interruptions; FPMS is a strong competitive edge for Cofely Fabricom teams.

Most of the other systems utilized in the industry are not as efficient as FPMS. As such, deviations and root causes are not detected immediately, making them harder to rectify later in the project or enabling only basic responses like increasing man-hours, or delaying project schedules. FPMS rectifies this situation.

Cofely Fabricom's overall cost reduction philosophy leverages the power of FPMS to guarantee cost efficiency and on-time delivery fast-tracking tasks where required. Moreover, it ensures full traceability of related costs and schedule adjustments.



FPMS & Exxon's High Pressure Hydrotreater Project

Project Overview

With its High Pressure Hydrotreater Project (HPH Project), ExxonMobil's objective was to upgrade the high-sulphur gasoil produced by its Antwerp Oil Refinery, one of the largest refineries in the Benelux, into automotive low-sulphur diesel oil, in accordance with European standards. To achieve this goal, ExxonMobil awarded the FEED and EPC of a grassroots desulfurization installation - a high-pressure hydrotreater - at its Antwerp Refinery to the engineering company Foster Wheeler.

Cofely Fabricom's Scope of Work

In 2008, Foster Wheeler awarded Cofely Fabricom a contract for the construction of the high-pressure hydrotreater at the ExxonMobil Oil Refinery, consisting of 28 modules. Cofely Fabricom's scope of work included the fabrication, transport, and on-site installation of these modules as well as the prefabrication of spools within the framework of Esso Belgium's HPH Project. More specifically, the contract awarded to Cofely Fabricom covered all of the following trades: mechanical (including structural steel), electrical, instrumentation, insulation, painting/coating, fireproofing, all completed at Cofely Fabricom's Hoboken Yard.

The HPH project represented one of Cofely Fabricom's most substantial onshore modular projects for a Belgian based customer. In this case, the module fabrication was critical to guarantee a safer work environment and work efficiency compared to the regular stick-built on-site approach.

Table1: ExxonMobil High Pressure Hydrotreater Project details

Owner	Esso Belgium (ExxonMobil)
Client	Foster Wheeler
FEED & EPC	Foster Wheeler
Project fabrication	Hoboken, Belgium
Project destination	Antwerp Refinery, Antwerp, Belgium
Start date	December 2008
Commissioning	End of 2011
Contract Value	€28,480,000
Total man hours	230,000

¹A high pressure hydrotreater consists of an installation that "desulphurizes" diesel by injecting hydrogen at a high level of pressure.

Challenge Accepted

Cofely Fabricom faced major challenges when during the construction of the HPH Project.

Challenge 1 – on time delivery

Cofely Fabricom was provided with expected delivery dates for the supply of material by its client, and built execution schedules on these delivery dates. Materials did not arrive on schedule. FPMS helped correct timelines and manage material scheduling challenges.

Challenge 2 – project scope revisions, added scheduling pressure

As in many construction projects, engineering needed to advance timelines without completing the final design to accommodate for other critical dates. The early start generated constant revisions to the initial completion date and on time delivery was a challenge. Taking into account difficult changes, including prefabrication design elements, FPMS helped managed work streams simultaneously while maintaining a safe environment.

FPMS: Cofely Fabricom's global project tool

FPMS is a key tool enabling Cofely Fabricom to deliver projects on schedule and within budget, balancing a commitment to HSE and Quality Assurance. FPMS proved that model and its value at EXXON's HPH Project.

ON TIME - FPMS provides real-time information on the status of the material needed for a project. Upon material delivery, each item is directly registered in the system, a material receipt document is automatically issued and the item allocated as per the execution plan. Should there be a delay in the delivery of certain items, FPMS automatically issues missing material reports and updates the initial project schedule in real time. FPMS stimulates proactive response at the workplace.

If material supply is delayed, FPMS draws attention to the issue immediately, informs the client and offers Cofely Fabricom the option to fast track the schedule if desired. At EXXON's HPH project, FPMS generated immediate notice of the delays in material supply; in turn, the operational teams directly informed the client and took action by fast-tracking the project schedule. As a result, on-time delivery was achieved as per initial schedule.

Project revisions – FPMS is designed to immediately detect and integrate any revision made to the initial engineering design. As soon as the revision is integrated in the system, FPMS produces an “action plan” in real time to adapt or fast-track the entire execution plan where needed, and automatically informs the client of budget implications resulting from the revision. Armed with real time data, the client now has the necessary time to approve or reject these additional costs based on concrete data.

FPMS allows Cofely Fabricom to monitor and adapt workplace traceable data in real time to make the right decision while managing client conflicts with other project partners. In the HPH project, FPMS successfully managed workplace teams to constantly adapt the execution plan, taking into account all the revisions made by the client and still achieve on-time delivery.

Charge forward confidently with FPMS

Cofely Fabricom leveraged FPMS, a unique project management system built on modular experience spanning over 25 years, to fabricate, transport and complete mechanical hook-up of 28 modules weighing a total of 5000 tonnes, in a safe and time-efficient schedule without delay.

FPMS managed 230,000 man hours over a 12 month period, with quality and HSE at the forefront of execution priorities. Piping, mechanical, electrical and instrumentation tasks were integrated with QA and HSE programs to deliver all modules to EXXON global standards.

The facility, designed to allow ExxonMobil to produce ‘cleaner’ diesel, was commissioned on-time at the end of 2011. ExxonMobil was extremely satisfied with the work Cofely Fabricom performed and thus awarded a second project at their Antwerp refinery.

