

# Technip Subsea Case Study using Acumen



11-Sept-13

Presenters: Cesar Ramos & Pat Smith

# Agenda

- Presenters intro
- Technip at a Glance
- Technip & Acumen
- Presentation of Case Study
- Live Demonstration of Acumen software (open floor for questions & comments)

# Presenters

## ■ Cesar Ramos

- Technip's North American Subject Matter Expert for Planning/Scheduling & Earned Value. He has a dual role as the Technip North American Onshore Business Unit Leader. Has experience in Offshore & Subsea as well.

## ■ Pat Smith

- Technip's North American P6 Administrator. Also has a dual role as the Technip North American Subsea Business Unit Leader. Has Onshore & Offshore experience as well.

# Technip at a Glance

Technip is a world leader in project management, engineering and construction for the energy industry.

From the deepest Subsea oil & gas developments to the largest and most complex Offshore and Onshore infrastructures, our 38,000 people are constantly offering the best solutions and most innovative technologies to meet the world's energy challenges.

Present in 48 countries, Technip has state-of-the-art industrial assets on all continents and operates a fleet of specialized vessels for pipeline installation and subsea construction.

Technip shares are listed on the NYSE Euronext Paris exchange and traded in the USA on the OTCQX marketplace (OTCQX: TKPPY).

## Quick Facts

- Technip is active in three business segments: [Subsea](#), [Offshore](#) and [Onshore](#)
- 38,000 people in [48 countries](#)
- [Industrial assets](#) on five continents
- A [fleet](#) of 28 vessels in operation and 8 more under construction
- 2012 operating income from recurring activities: €821.7 million
- [2012 revenues](#) of more than €8.2 billion
- Technip is listed on Euronext Paris (EURONEXT: FR0000131708)



# Technip & Acumen History

- Technip started using Acumen Fuse in 2009.
- Acumen was officially incorporated into Technip North America's Schedule Review Procedure in 2010.
- Technip Schedule Review Procedure consists of the following:
  - Compliance with Technip standards of EPC schedule development
  - Compliance with PMBOK & AACE.
  - Technip follows Acumen Metrics [250] which include; PMI, AACE, DCMA, & others
- Technip has acquired the full Acumen Suite which has Acumen Risk.
- After a Technip/Acumen presentation in a conference in Brazil 2013, Technip Corporation has acquired over 25+ Acumen Licenses Globally.



# TECHNIP SUBSEA EPCI SCHEDULE ANALYSIS

An innovated way of analyzing using  
Acumen was needed. Acumen Analyzed  
11-Oct-12; 4:14pm (total 2hrs 20min)



# Recognizing the Need for Analysis

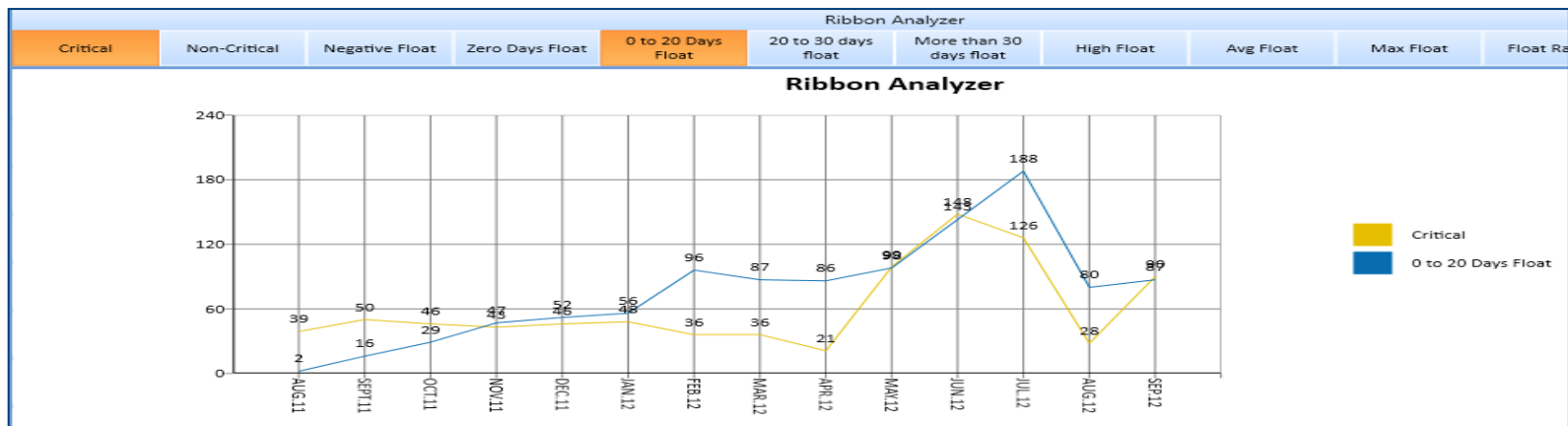
A full Subsea EPCI contract was awarded. As the project progressed, delays started occurring to the project which delayed Engineering Deliverables & began to impact Offshore Mobilization Date & Critical Equipment Delivery.

- Engineering Delays required forensic analysis of all possible impacts to these delays.
- Initial analysis provided belief that the client had impact to these delays.
- Upon further research the evidence was clear.
- In order to support a change order, to prove the impact, the business unit required supporting details and analysis.
- The initial attempt was to review the depletion of float, that was caused by the client.

# Analyzing with Acumen

Once the need was recognized, a small peer group to explore the limitations of Acumen. Gathering all files, the business unit had to compare all project files to see how we could prove this.

- Acumen Phase Analyzer does not produce overlapping graphs over a timeline. This was confirmed by Acumen.
- Acumen recommendation was to export to Excel for further graph modifications
- The planner had saved all monthly updates as baselines. So as it was suggested that we take every baseline and compare as snapshots.
- With this we were able to emulate the graph functions out of Acumen as a timeline.
- See example below Float Ribbon Analyzer [count per time]



# Implementing the Concept of Analysis

A concept of loading each updated schedule as a snapshot seemed to be a feasible solution. The difference from a normal snapshot comparison is we knew the snapshots represented an updated cycle. By renaming the file name as a time stamp, the graph looked like time analyzed graph.

- In order to emulate this function we had to do the following:
  - Imported 14 XER files to Acumen
  - To our benefit, Pat Smith [assigned planner] had backed up every month XER.
  - This allowed us to “act” as if each XER is a time stamp
  - We renamed each XER to reflect the month
  - Then produced a comparison of multi files named as months.
  - Acumen naturally compares projects but in this instance each project represented a month, allowing a graph that looks like a time scale.
  - For future notice; if other projects follow similar scrutiny and do not backup or copy files periodically (monthly? Wkly?), this emulation of a timeline can not be reproduced within Acumen. Of course using Excel will allow modifications.

# TECHNIP SUBSEA EPCI FLOAT ANALYSIS Phase I of Analysis

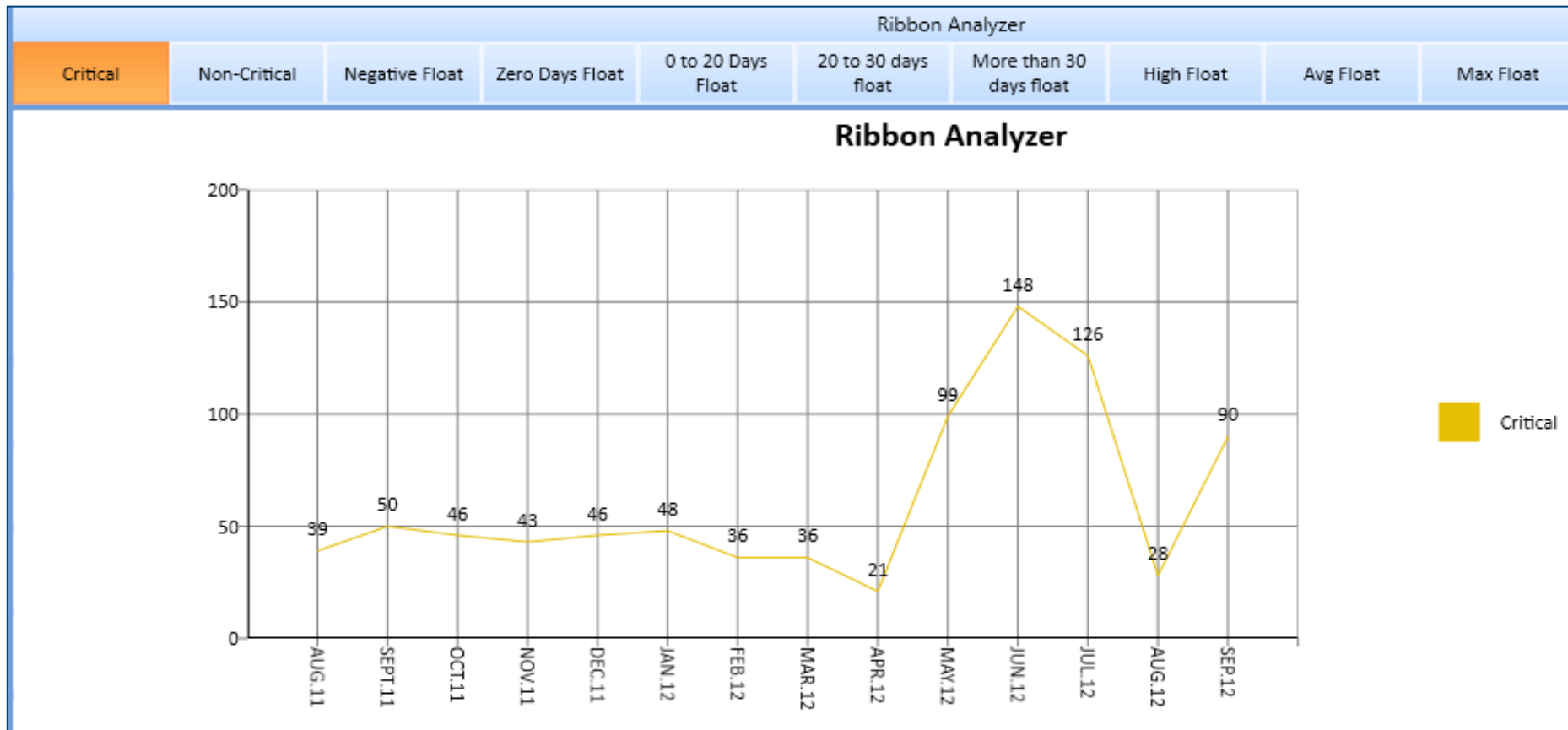
Utilizing the graphical impacts in Acumen we were able to begin researching detail impacts.



# Critical Float [count of activities]

Our immediate place to compare was the Float depletion & behavior.

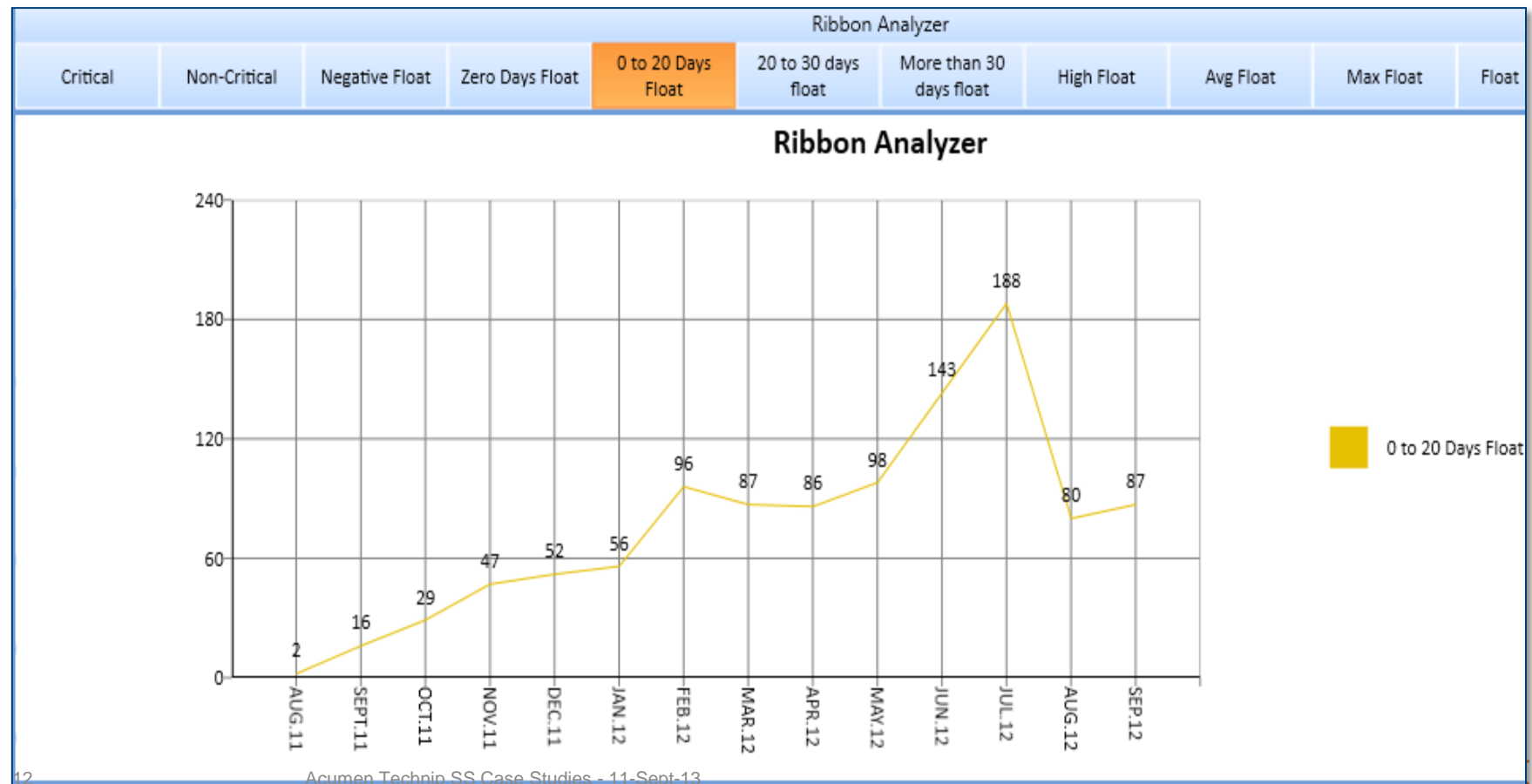
- As you can see in the example, there was a substantial jump in critical float count.
- This allowed us to further investigate.



# 0 to 20 Days Float [count of activities]

Our next place to compare was further Float depletion & behavior.

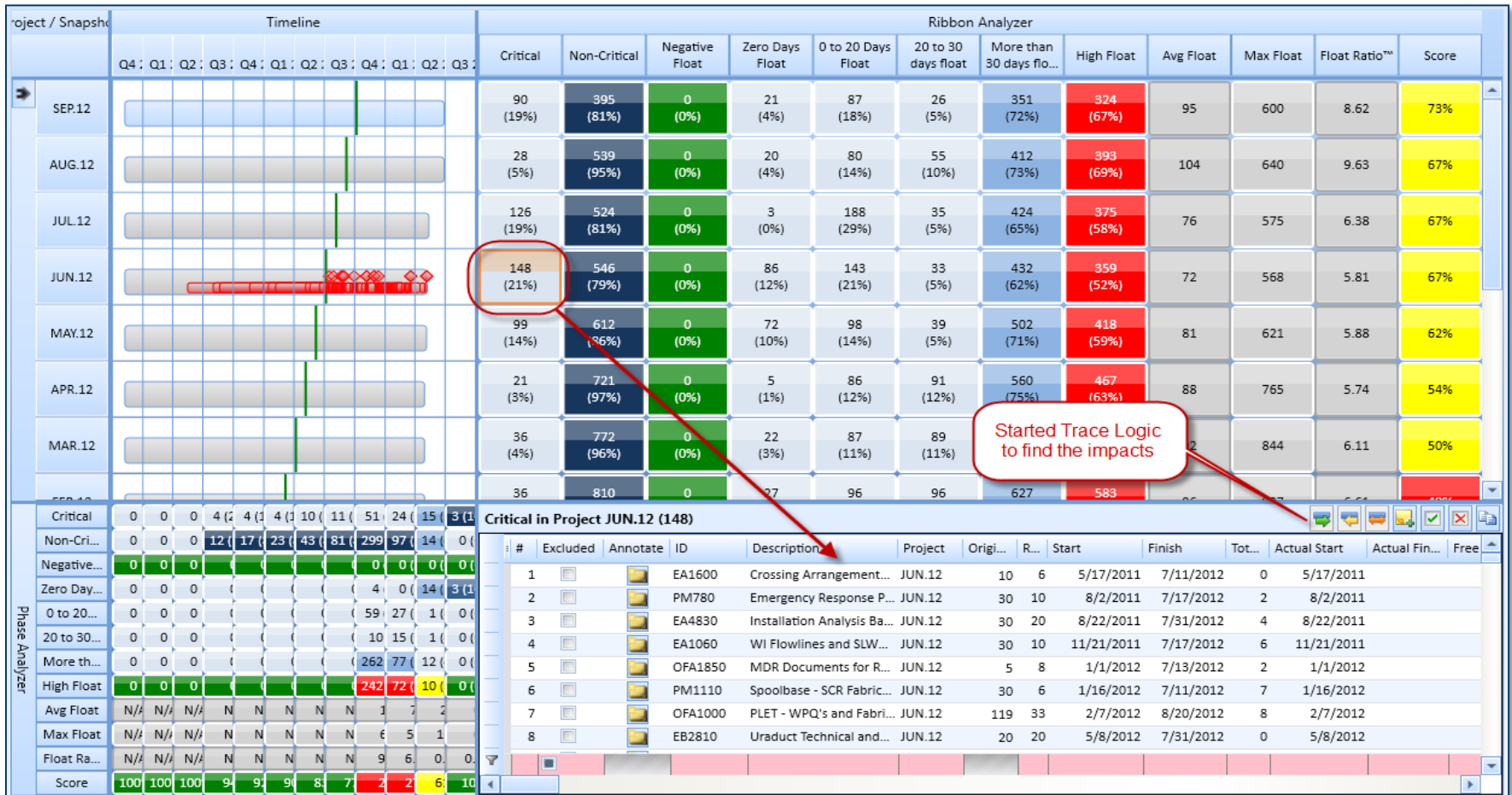
- We looked at Non-Critical and didn't find alarming behaviors so we moved on to 0 to 20 Days Float [count of activities]. This also pulled up anomalies.



# Ribbon & Trace Logic

Ribbon & Trace Logic allowed us to dissect indicators.

- Tracing the peak critical, then started looking at the IFC drawings.



# Trace Logic Backwards Analysis

Trace Logic allowed us to dissect indicators.

- Here is where the indicator of Client Review cycles extended beyond contractual agreements.

Tracing Backwards: Installation Analysis Basis of Design - IFC (9)

Annotate	ID	Description	Project	Original D...	Re...	Start	Finish	Total Float	Actual Duration	Actual Start	Actual Finish	Fr
	A1230	Contract Award	JUN.12		0	0	11/8/2010	11/8/2010	0	0	11/8/2010	11/8/2010
	A1020	Deliverable Kickoff	JUN.12		0	0	1/1/2011	1/1/2011	0	0	1/1/2011	1/1/2011
	A1210	Project Team Kickoff	JUN.12		0	0	1/10/2011	1/10/2011	0	0	1/10/2011	1/10/2011
	EA4570	Mobilize Engineering Team	JUN.12		5	0	1/10/2011	1/14/2011	0	5	1/10/2011	1/14/2011
	EA4580	Assign Roles and Responsibilities	JUN.12		5	0	1/14/2011	1/20/2011	0	5	1/14/2011	1/20/2011
	EA4590	Begin Engineering Package Process	JUN.12		30	0	1/24/2011	3/3/2011	0	29	1/24/2011	3/3/2011
	EA4810	Installation Analysis Basis of Design - IFR	JUN.12		40	0	2/7/2011	3/24/2011	0	33	2/7/2011	3/24/2011
	EA4820	Installation Analysis Basis of Design - Client Review...	JUN.12		10	0	3/24/2011	8/19/2011	0	104	3/24/2011	8/19/2011
	EA4830	Installation Analysis Basis of Design - IFC	JUN.12		30	20	8/22/2011	7/31/2012	4	219	8/22/2011	

Client Review cycles contractually were 10 days but seen here took almost 5 months. As further researched almost all review cycles took beyond the contractual time.

# Trace Logic Export to Excel

Trace Logic export to Excel allows for further analysis.

- Using Excel with combinations of Filters, Sorts, & Conditional Formatting allows us to find exact details.

Acumen Fuse® Analyst Report													
Subsea Schedule Analysis 11-Oct-12_3.19pm - 19696 Activities													
Float													
Created on:: 9/11/2013													
Created by:: cesramos													
SEP.12: Detailed View													
Critical													
Number of critical activities.													
Excluded	ID	Description	Original Duration	Start	Finish	Total Float	Finish Variance	Actual Duration	Duration Variance	Baseline Start	Baseline Finish	Actual Start	Actual Finish
FALSE	EA44	Anode Installation Procedure and ITP - Client Review / Approval	10.00	5/18/2012	10/11/2012	6	-100	91.00	-81.00	6/19/2012	7/3/2012	5/18/2012	
FALSE	EA42	Initiation Pile Installation Procedure - Client Review / Approval	10.00	6/18/2012	10/11/2012	10	-72	71.00	-61.00	7/17/2012	7/31/2012	6/18/2012	
FALSE	EA56	Sleepers Loadout Procedure- Client Review / Approval	10.00	10/4/2012	10/17/2012	6	0	0.00	10.00	10/4/2012	10/17/2012		
Non-Critical													
Number of non-critical activities.													
Excluded	ID	Description	Original Dur	Start	Finish	Total Float	Finish Variance	Actual Duration	Duration Variance	Baseline Sta	Baseline Fir	Actual Sta	Actual Finis
FALSE	EA48	Production and WI Flowlines Normal Lay Installation Analysis	10.00	9/7/2011	10/11/2012	174	-387	269.00	-259.00	9/7/2011	9/20/2011	9/7/2011	
FALSE	EA44	Concrete Mattress Installation Procedure - Client Review / Approval	10.00	10/21/2011	10/11/2012	169	-342	236.00	-226.00	10/21/2011	11/4/2011	#####	
FALSE	EB10	ON1, ON2 Umbilicals Installation Analysis Report - Client Review / Approval	10.00	3/28/2012	10/11/2012	109	-182	128.00	-118.00	4/2/2012	4/12/2012	3/28/2012	
FALSE	PM1	COMPANY Items Handover Procedure - Client Review / Approval	10.00	4/4/2012	10/19/2012	169	-171	123.00	-113.00	4/17/2012	5/1/2012	4/4/2012	
FALSE	PM1	Logistics Plan for Offshore Operations - Client Review / Approval	10.00	5/15/2012	10/19/2012	169	-154	94.00	-84.00	5/7/2012	5/18/2012	5/15/2012	
FALSE	EA42	SLWR VIV Strakes Installation Procedure - Client Review / Approval	10.00	5/15/2012	10/11/2012	174	-121	94.00	-84.00	5/30/2012	6/12/2012	5/15/2012	
FALSE	EA43	Buoyancy Module Installation Procedure and ITP - Client Review / Approval	10.00	5/18/2012	10/11/2012	169	-121	91.00	-81.00	5/30/2012	6/12/2012	5/18/2012	
FALSE	EA47	SLWR VIV Fairings Installation Procedure - Client Review / Approval	10.00	5/23/2012	10/11/2012	169	-128	88.00	-78.00	5/21/2012	6/5/2012	5/23/2012	
FALSE	EB21	PIPE LAY VESSEL Umbilical Loadout and Transpooling Procedure	10.00	5/24/2012	10/11/2012	164	-141	87.00	-77.00	5/10/2012	5/23/2012	5/24/2012	
FALSE	EA43	Sleeper Installation Procedure - Client Review / Approval	10.00	5/30/2012	10/4/2012	10	-114	84.00	-74.00	5/30/2012	6/12/2012	5/30/2012	
FALSE	EB17	Flexible Jumpers Anodes Fabrication ITP - Client Review / Approval	10.00	7/10/2012	10/11/2012	39	-35	58.00	-48.00	8/22/2012	9/6/2012	7/10/2012	
FALSE	EB20	Umbilical Reel Loadout Procedure and ITP - Client Review / Approval	10.00	7/11/2012	10/11/2012	164	-48	57.00	-47.00	8/13/2012	8/24/2012	7/11/2012	
FALSE	EA41	Flowline and SLWR Installation Procedure and Work Plan	10.00	7/16/2012	10/11/2012	169	-76	53.00	-43.00	7/16/2012	7/27/2012	7/16/2012	
FALSE	EA58	WI & Production SLWRs Transfer Procedure to FPSO - Client Review / Approval	10.00	7/16/2012	10/11/2012	164	-76	53.00	-43.00	7/16/2012	7/27/2012	7/16/2012	
FALSE	EA59	WI & Production SLWRs Transfer Procedure to FPSO - Client Review / Approval	10.00	7/16/2012	10/11/2012	164	-76	53.00	-43.00	7/16/2012	7/27/2012	7/16/2012	
FALSE	EA62	WI SLWR Transfer Analysis Report - IFC	5.00	7/17/2012	10/5/2012	184	-72	52.00	-47.00	7/18/2012	7/25/2012	7/17/2012	
FALSE	EA41	Flowline and SLWR Installation Ctgy Procedure - Client Review / Approval	10.00	7/19/2012	10/11/2012	164	-76	50.00	-40.00	7/16/2012	7/27/2012	7/19/2012	
FALSE	PM1	Assemble As-Built TOC - IFR	5.00	7/23/2012	10/19/2012	139	-72	49.00	-44.00	8/1/2012	8/8/2012	7/23/2012	
FALSE	EB15	Flexible Jumper SIT Procedure - IFC	5.00	8/2/2012	10/15/2012	158	-62	40.00	-35.00	8/8/2012	8/14/2012	8/2/2012	
FALSE	OFB1	Flexible Jumper Bend Restrictors - Fabrication	44.00	8/6/2012	10/10/2012	20	-5	39.00	5.00	8/6/2012	10/5/2012	8/6/2012	

# TECHNIP SUBSEA EPCI EARNED VALUE WORK ANALYSIS

## Phase II of Analysis

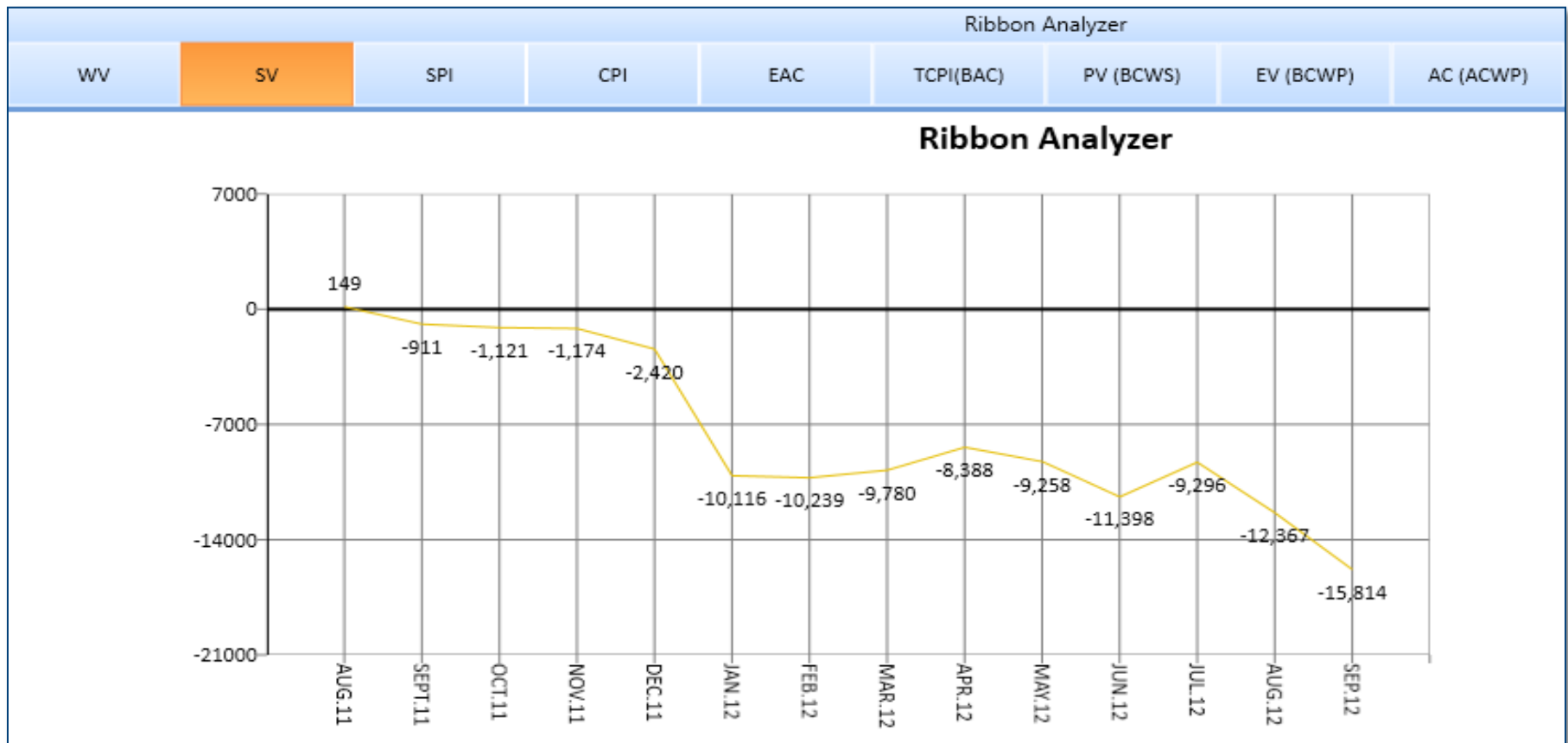
Utilizing the graphical impacts in Acumen we were able to begin researching detail impacts.



# Earned Value Work Schedule Variance [EV-PV]

Schedule Variance provides a comparison of “where we planned to be” vs “where we really are”.

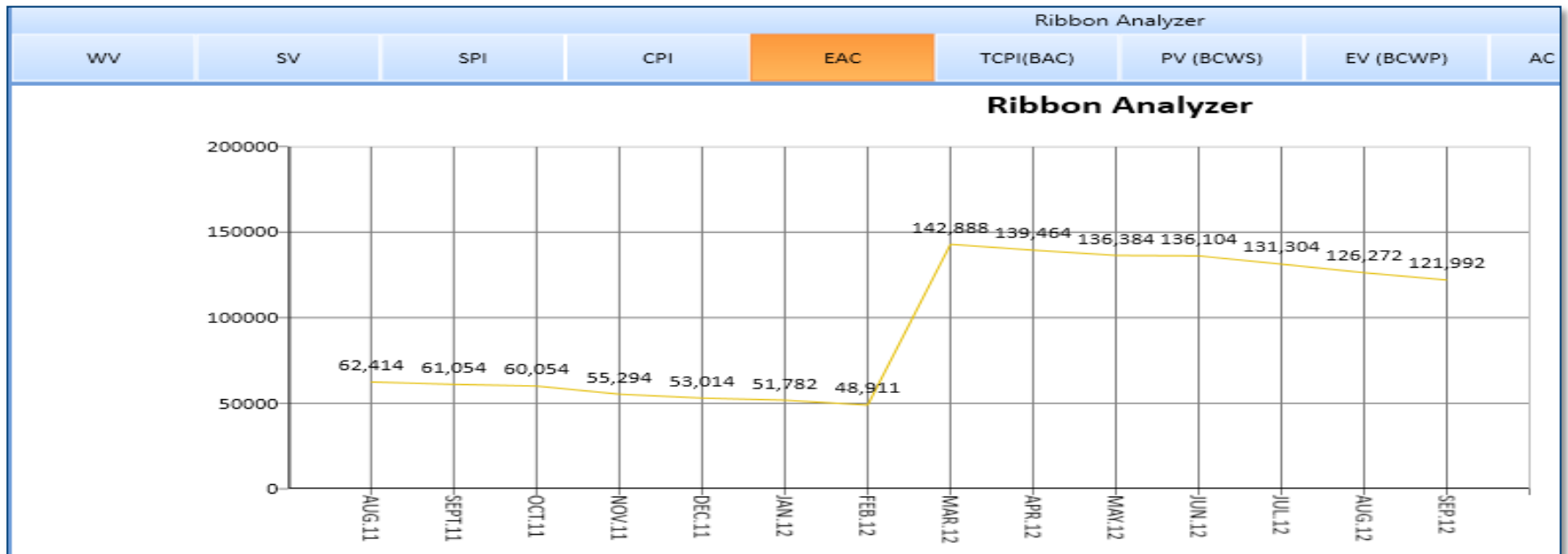
- Schedule Variance is using P6 values and is calculated as Earned minus Planned.
- This variance shows a disparity of slipping on planned dates and is used to calculate a recovery index.



# Earned Value Work Estimate at Complete [EAC]

Estimate at Completion provides necessary forecasting.

- Estimate at Completion has 5 different calculations. However the most common is using the “Remaining to Earn + Actual Costs”. Acumen brings in the P6 calculation of EAC.
- Since the project is still in progression and has almost halfway remaining to complete, it is important to use current performance to provide a valid means of forecasting.
- This EAC can be used to forecast cost impacts where engineering delays, manufacturer delays due to held up specs & data sheets as well as the impact of delaying the Pipe Lay Vessel and what that equates to dollars.



# Conclusion

As the results of the Float Analysis, Trace Logic Analysis, & Earned Value Work, we were able to determine a cost impact to these delays.

These cost impacts to support the change order was submitted up to contracts management for approval & submit to the client.

The analysis proven to be extremely useful & favorable.

The results still pending & confidential.

# QUESTIONS?

FEEL FREE TO ASK QUESTIONS  
OR COMMENTS



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