15 - 16 November, Wembley Stadium, UK

Risk Based Controls
(Scaling Project Controls Practices)

Project Controls EXPO
London,UK

شركة تنمية نفط عمان
Petroleum Development Oman

(W)www.projectcontrolexpo.com/uk (M) +44 (0) 203 883 1386 (E)info@projectcontrolexpo.com

2022

About the Speaker

- Technical Services Lead within FEED Office, Petroleum Development Oman
- 11+ years experience in Project Controls within Oil & Gas Industry
- Led various continuous improvement initiatives within Planning & Scheduling, Cost Engineering, Risk Management, Change Management, Projects Reporting and Project Health Checks.
- Worked with Multi-billion-dollar projects and developed Project Controls expertise in all key phases of a project from Initiation phase to final handover
- Hands-on experience in various Project Controls products, e.g., Oracle Primavera, MS Projects, EcoSys, Easy Risk, Acumen Fuse, SAP, Tableau, SPO etc.

Hamza Afdhal Mehdi Mirza

Technical Services Lead

Petroleum Development Oman

Petroleum Development Oman

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About the Topic

- ❑ What is Risk Based Controls and its key objectives?
- ❑ What are the key challenges?
- ❑ How optimization within tools and systems achieved?
- ❑ What were the key benefits / quick wins?

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شركة تنمية نفط عمان
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9,000
Direct Staff

60+
Nationalities

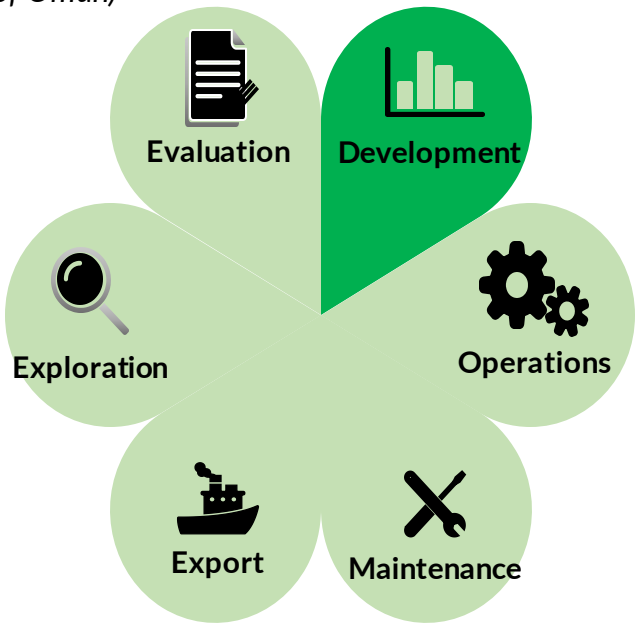
60,000
Contractor Staff

60%
Energy Development Oman
(on behalf of Government of Oman)

34%
The Shell Group

4%
Total

2%
PTTEP



>9400
Active Wells

230
Operating Units

> 33,000 km
of Pipelines & Flowlines

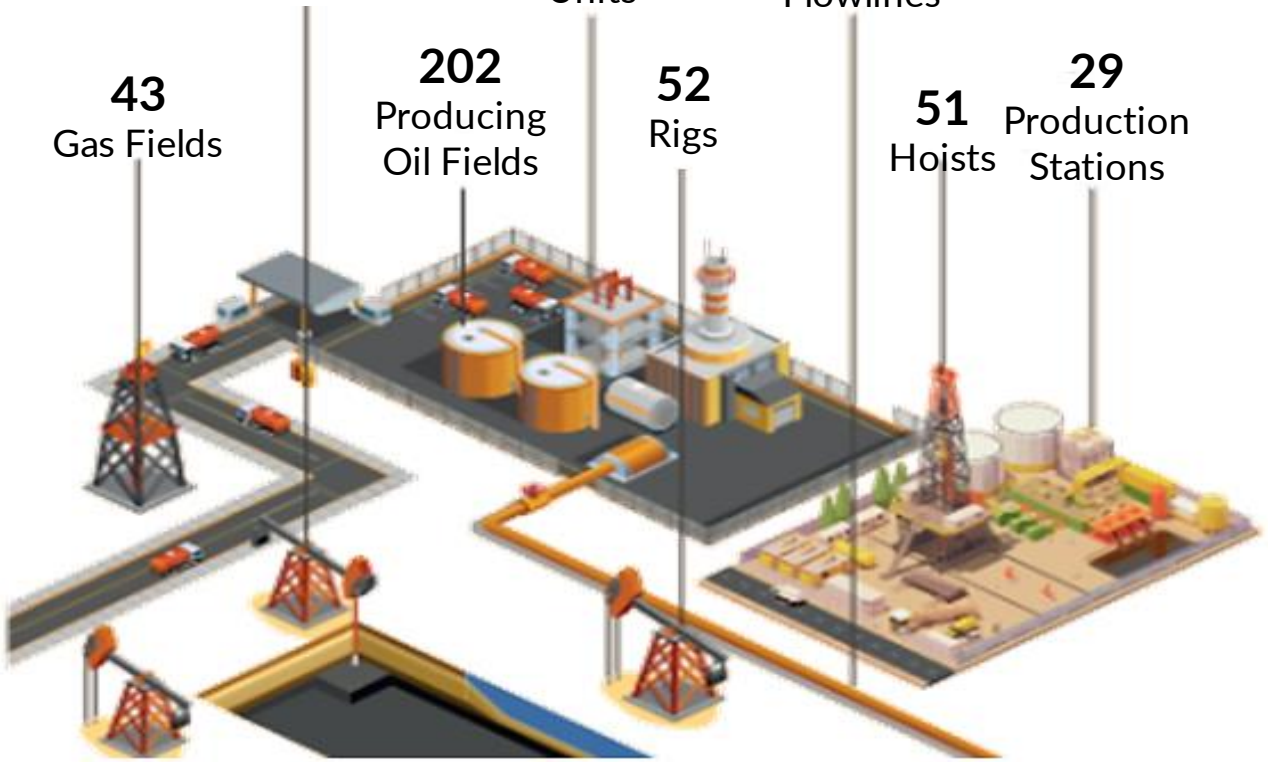
43
Gas Fields

202
Producing Oil Fields

52
Rigs

51
Hoists

29
Production Stations



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About FEED Office

PDO FEED Office set up in 2008 with the following objective:-

- To improve project definition (FEL) & Capital Cost Estimates at FID
- To provide development opportunities for local talent
- To improve project lead time
- To have minimum strategic execution capability

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Opportunity Realisation

1 Identify the Opportunity

2 Assess the Opportunity

3 Concept Selection and Basis of Design

4 Front-End Engineering Design

5 Detail Design, Procurement & Construction

6 Operations

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Opportunity Realisation

Identify the Opportunity

1

Assess the Opportunity

2

Concept Selection and Basis of Design

3

Front-End Engineering Design

4

FEED Office Scope

Detail Design, Procurement & Construction

5

Operations

6

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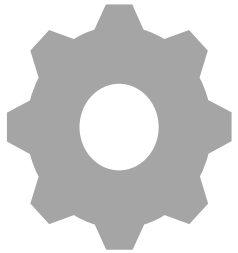
Project Controls Function

Below are the key functions of Project Controls functions followed within FEED Office

Initiate

- Establish Scope & WBS
- Initiate CTR Development
- Prepare PAF and seek budget approval

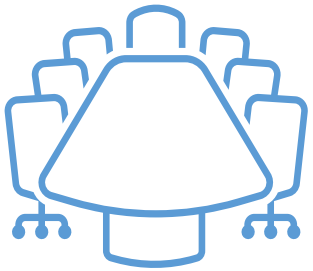


Project Set up

- Schedule Development & Set Baseline
- Setup Progress Measurement Sheet
- Setup Reporting systems

Monitoring & Reporting

- Monitor, Measure and Report actual progress
- Update Schedules and Re-forecast on Monthly Basis



Change Management

- Maintain Change Control Register
- Conduct impact assessment
- Schedule Re-baselining and Revise Progress Measurement System
- Update Cost Reporting

Project Closeout

- Capture Lesson Learn
- Ensure close-out of all actions
- Support in Project Close Out

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Introduction to Risk Based Control

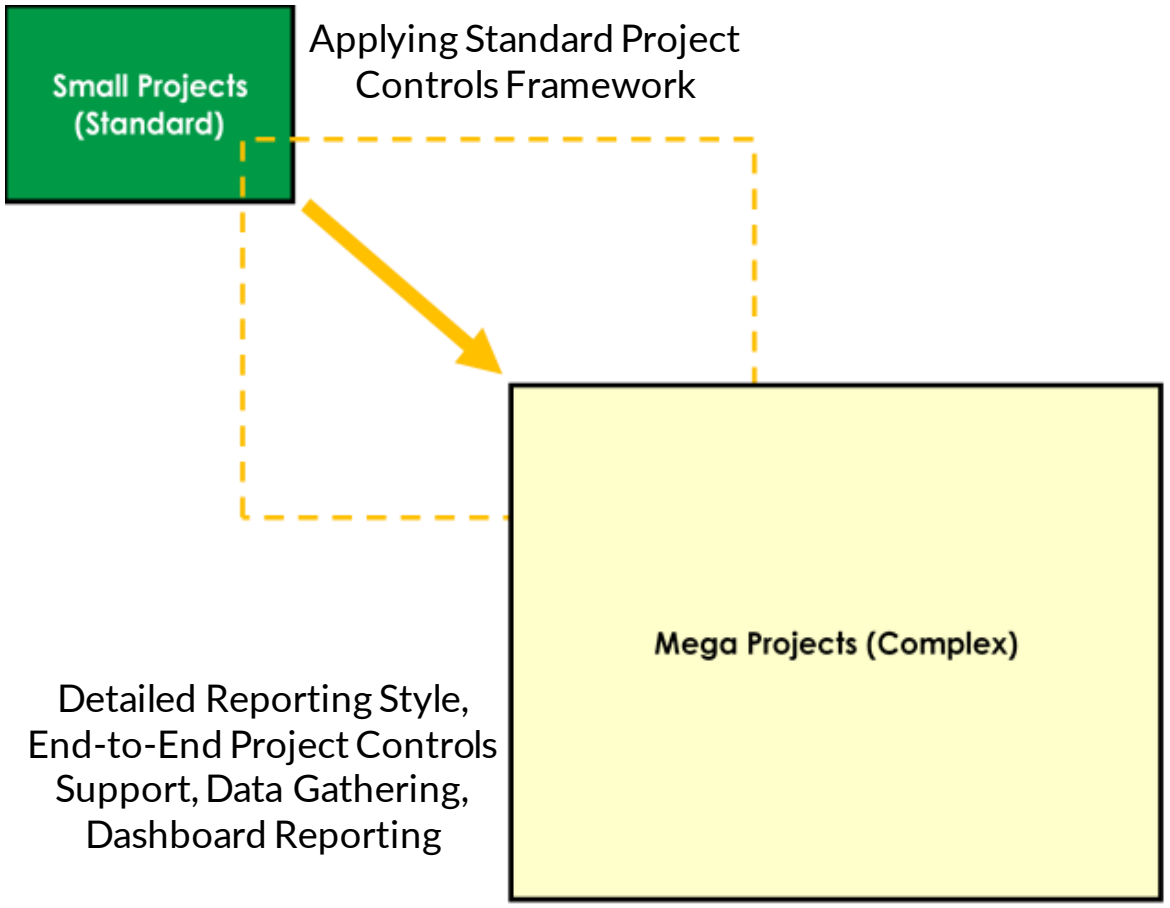
- With an influx of executing projects of different types, sizes and complexity, there was a need to establish a mechanism that will ensure the correct scalability and level of effort required by Project Controls Engineer within FEED Office (FO).
- In the span of last 14 years, FEED Office has proved its capability by successfully executing CSR, BfD, FEED, FEED+DD, DD and many miscellaneous projects.

Objectives

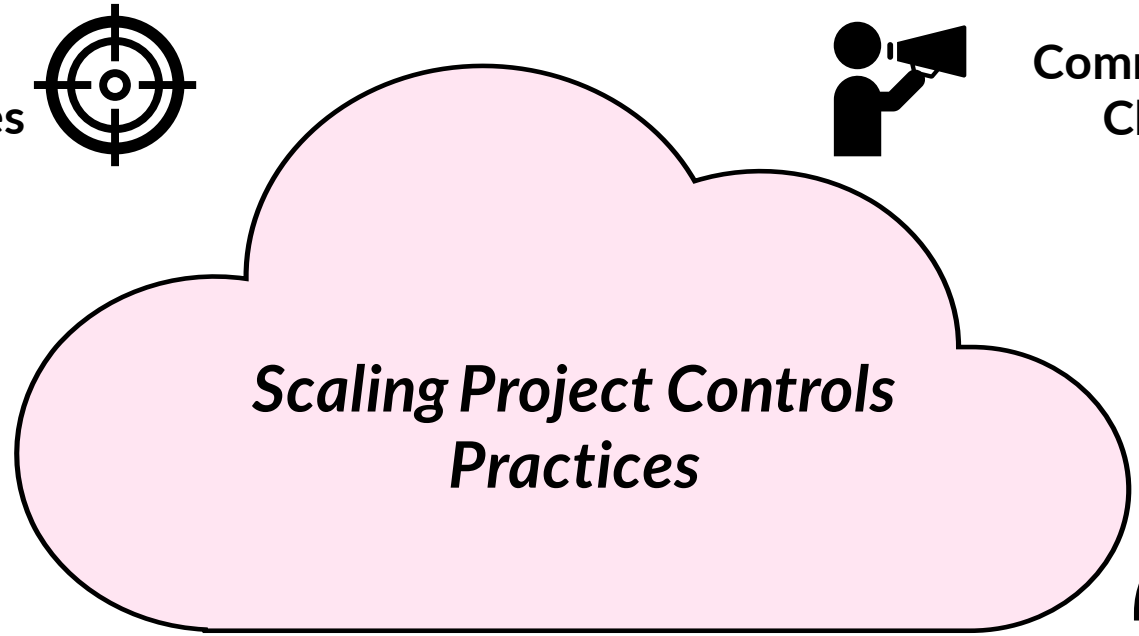
- The main objective of Risk Based Controls (RBC) is to apply **comprehensive** and **fit for purpose** project controls requirement on various type and size of projects

- Assist top management to adhere with the preferred practices which is to an acceptable level

- To keep a clear visibility and control for any given type of project



Key Challenges



Unclear Objectives

Communication Channels

Resource Constraints

Budgeting Issues

Unrealistic Prioritisation and Planning

Inadequate Risk Management

Scope Definition

Lack of Skills

Unrealistic timelines

Generic Attributes - Earlier Classification

- Earlier classification of key Project Controls requirement was generic and applicable to all type of projects

Sl No	Document Required	Mega Projects	Major Projects	Minor Projects	Ad-Hoc Projects
1	Project Approval Form	√	√	√	
2	Cost Time Resource Catalogue (CTR)	√	√	√	
3	Schedule (Primavera)	√	√	√	
4	Project Reports (Weekly, Monthly, Cost)	√	√	√	
5	Project Control Plan	√	√		
6	Customer Feedback	√	√		

Note: - (√) Applicable

Risk Based Control - New Classification

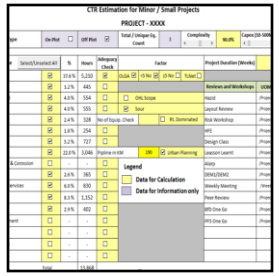
- Risk based Controls is not a standardised activity and it cannot be replicated from one organization to another organization. It is based on organizational experience, type of projects executed in the past.

Key Requirements	Mega	Major	Minor	Small	Adhoc	Unit of Measurement
	>60k Manhours	20k - 60k Manhours	10k - 20k Manhours	5k - 10k Manhours	<5k Manhours	
CTR in Database / Excel	√	√	√	√	O	Per Project
TPS Estimate in Excel	√	√	√	√	O	Per Project
Project Approval Form	√	√	√	√	O	Per Project
Project Control Plan	√	O	N/A	N/A	N/A	Per Project
High Level Project Plan	√	√	O	O	N/A	Per Project
Project Schedule in P6 (Resource Loaded)	√	√	O	N/A	N/A	Per Project
Project Schedule in Excel	N/A	N/A	O	√	N/A	Per Project
Weekly Progress Report	√	√	√	√	N/A	Per Week
Monthly Progress Report	√	O	N/A	N/A	N/A	Per Month
Monthly Update of P6 / Excel Schedule	√	O	N/A	N/A	N/A	Per Month
Monthly Cost Report	√	√	O	O	N/A	Per Month
TPS Control & Tracker	√	√	√	√	O	Per Month
Final (As-Built) Schedule	√	√	√	N/A	N/A	Per Project
Final Cost Report	√	√	√	O	N/A	Per Project

Note: - (NA) Not Applicable, (√) Applicable & (O) Optional

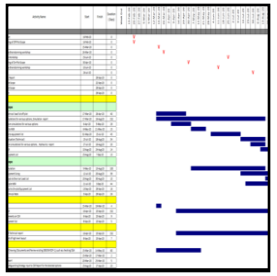
Tools & Systems - Optimization

- New Tools & System established to ensure the adherence to Risk Based Controls is rightly followed across FEED Office
- The optimization within the Project Controls framework helped in organize specific templates
- Expected Inputs or Outputs that project personnel use for the different categories of project (Adhoc, Small, Minor, Medium & Major)
- Helps to drive consistency in how project personnel apply the preferred project control practices for a given project



CTR Estimation

Schedule Preparation

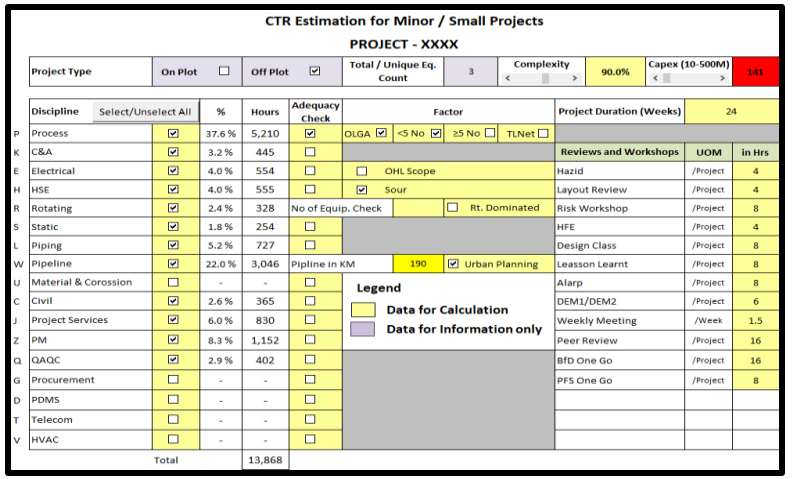


Discipline	Original Budget	Approved Changes	Current Budget	Planned
PROJECT MANAGEMENT				
HSSE				
PROCESS				
MECHANICAL ROTATING				
MECHANICAL STATIC				
PLANT PIPING				
PIPELINES				
DESIGN SYSTEM ADMIN				
MATERIAL/CORROSION				
ELECTRICAL				
CONTROL & AUTOMATION				
TELECOMMUNICATION				
CIVIL / STRUCTURAL				
FO Manhours				
FO 3rd Party services				

Optimized Cost Reporting

CTR Estimation

In this new methodology, certain category of projects was identified qualifying for top-down estimate by using high level scope parameter based on Project CAPEX, Equipment count and Project Complexity, type of project etc.



CTR Estimation for Minor / Small Projects

PROJECT - XXXX

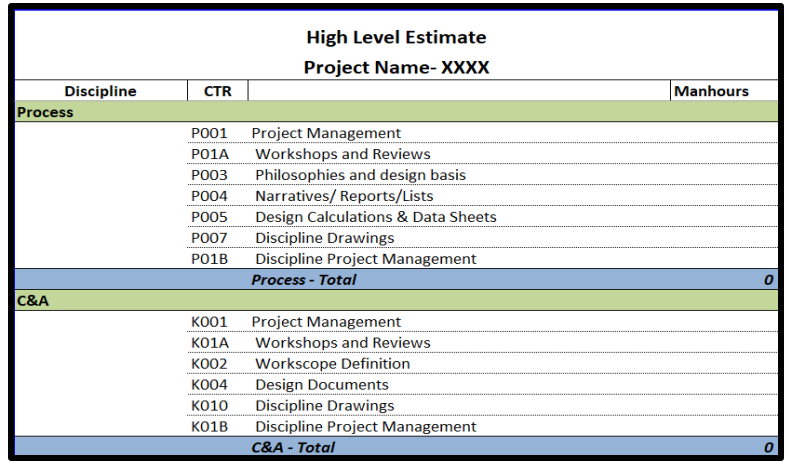
Project Type	On Plot ☐	Off Plot ☑	Total / Unique Eq. Count	3	Complexity	90.0%	Capex (10-500M)	141

	Discipline	Select/Unselect All	%	Hours	Adequacy Check	Factor	Project Duration (Weeks)	24
P	Process	☑	37.6 %	5,210	☑	OLGA ☑ <5 No ☑ ≥5 No ☐ TLNet ☐		
K	C&A	☑	3.2 %	445	☐		Reviews and Workshops	UOM	In Hrs
E	Electrical	☑	4.0 %	554	☐	☐ OHL Scope	Hazid	/Project	4
H	HSE	☑	4.0 %	555	☐	☑ Sour	Layout Review	/Project	4
R	Rotating	☑	2.4 %	328	No of Equip. Check	☐ Rt. Dominated	Risk Workshop	/Project	8
S	Static	☑	1.8 %	254	☐		HFE	/Project	4
L	Piping	☑	5.2 %	727	☐		Design Class	/Project	8
W	Pipeline	☑	22.0 %	3,046	Pipline in KM 190	☑ Urban Planning	Leasson Learnt	/Project	8
U	Material & Corossion	☐	-	-	☐	Legend	Alarp	/Project	8
C	Civil	☑	2.6 %	365	☐	Data for Calculation	DEM1/DEM2	/Project	6
J	Project Services	☑	6.0 %	830	☐	Data for Information only	Weekly Meeting	/Week	1.5
Z	PM	☑	8.3 %	1,152	☐		Peer Review	/Project	16
Q	QAQC	☑	2.9 %	402	☐		BfD One Go	/Project	16
G	Procurement	☐	-	-	☐		PFS One Go	/Project	8
D	PDMS	☐	-	-	☐				
T	Telecom	☐	-	-	☐				
V	HVAC	☐	-	-	☐				
	Total			13,868					

CTR Estimation Tool for Minor Projects

Objectives-

- To reduce the level of efforts, especially for small projects like BfD, Inhouse CTR estimation tool was developed for FEED Office PDO.
- From 2 weeks of CTR preparation time, the time duration was dropped to 4 days. With that, the level of effort was reduced by 63%.



High Level Estimate

Project Name- XXXX

Discipline	CTR		Manhours
Process			
	P001	Project Management	
	P01A	Workshops and Reviews	
	P003	Philosophies and design basis	
	P004	Narratives/ Reports/Lists	
	P005	Design Calculations & Data Sheets	
	P007	Discipline Drawings	
	P01B	Discipline Project Management	
		Process - Total	***0***
C&A			
	K001	Project Management	
	K01A	Workshops and Reviews	
	K002	Workscope Definition	
	K004	Design Documents	
	K010	Discipline Drawings	
	K01B	Discipline Project Management	
		C&A - Total	***0***

High level Estimate (Deliverables & Activities)

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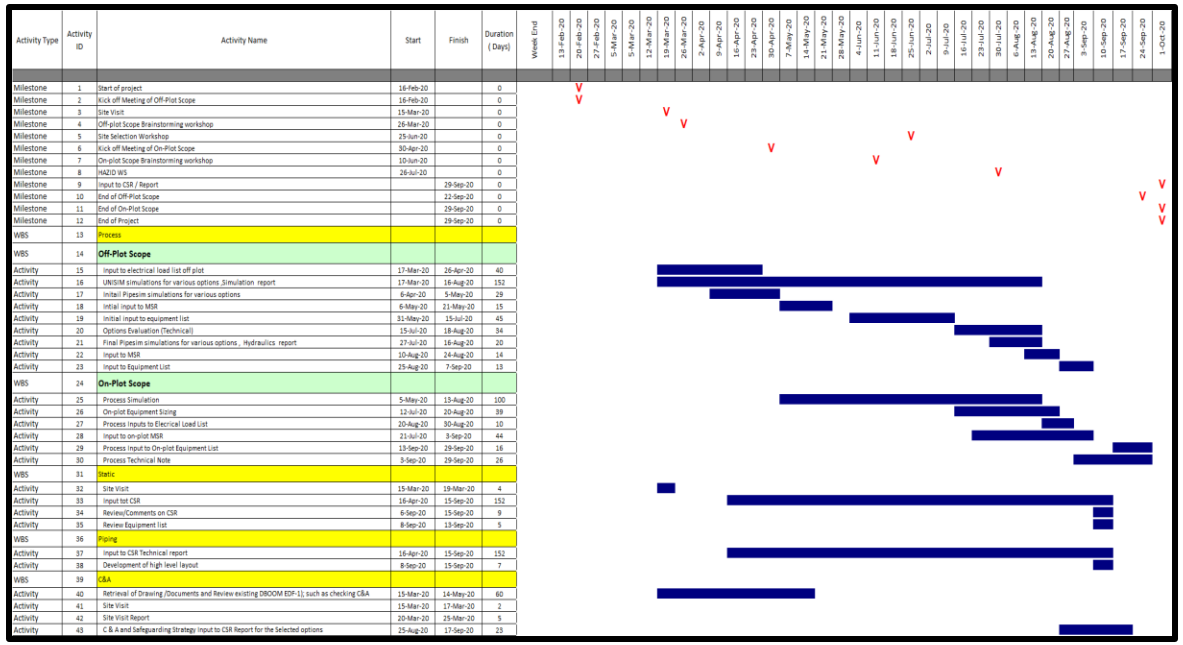
Schedule Preparation

- A Standardisation was established based on FEED Office previous experience on small type of projects. It reduced the cycle time of schedule preparation by 50%.
- This was established to minimize the schedule preparation time for small projects where time span is not more than 6 months. From 2 weeks schedule preparation time, the time duration was dropped to 4 days. With that, the level of effort was reduced by 60%



Activity Type	Activity ID	Activity Name	Start	Finish	Duration (Days)
Milestone	1	Start of project	16-Feb-20		0
Milestone	2	Kick off Meeting of Off-Plot Scope	16-Feb-20		0
Milestone	3	Site Visit	15-Mar-20		0
Milestone	4	Off-plot Scope Brainstorming workshop	26-Mar-20		0
Milestone	5	Site Selection Workshop	25-Jun-20		0
Milestone	6	Kick off Meeting of On-Plot Scope	30-Apr-20		0
Milestone	7	On-plot Scope Brainstorming workshop	10-Jun-20		0
Milestone	8	HAZID WS	26-Jul-20		0
Milestone	9	Input to CSR / Report		29-Sep-20	0
Milestone	10	End of Off-Plot Scope		22-Sep-20	0
Milestone	11	End of On-Plot Scope		29-Sep-20	0
Milestone	12	End of Project		29-Sep-20	0
WBS	13	Process			
WBS	14	**Off-Plot Scope**			
Activity	15	Input to electrical load list off plot	17-Mar-20	26-Apr-20	40
Activity	16	UNISIM simulations for various options ,Simulation report	17-Mar-20	16-Aug-20	152
Activity	17	Initail Pipesim simulations for various options	6-Apr-20	5-May-20	29
Activity	18	Initial input to MSR	6-May-20	21-May-20	15
Activity	19	Initial input to equipment list	31-May-20	15-Jul-20	45
Activity	20	Options Evaluation (Technical)	15-Jul-20	18-Aug-20	34
Activity	21	Final Pipesim simulations for various options , Hydraulics report	27-Jul-20	16-Aug-20	20
Activity	22	Input to MSR	10-Aug-20	24-Aug-20	14
Activity	23	Input to Equipment List	25-Aug-20	7-Sep-20	13
WBS	24	**On-Plot Scope**			
Activity	25	Process Simulation	5-May-20	13-Aug-20	100
Activity	26	On-plot Equipment Sizing	12-Jul-20	20-Aug-20	39
Activity	27	Process Inputs to Elecrical Load List	20-Aug-20	30-Aug-20	10
Activity	28	Input to on-plot MSR	21-Jul-20	3-Sep-20	44
Activity	29	Process Input to On-plot Equipment List	13-Sep-20	29-Sep-20	16
Activity	30	Process Technical Note	3-Sep-20	29-Sep-20	26
WBS	31	Static			
Activity	32	Site Visit	15-Mar-20	19-Mar-20	4
Activity	33	Input tot CSR	16-Apr-20	15-Sep-20	152
Activity	34	Review/Comments on CSR	6-Sep-20	15-Sep-20	9
Activity	35	Review Equipment list	8-Sep-20	13-Sep-20	5
WBS	36	Piping			
Activity	37	Input to CSR Technical report	16-Apr-20	15-Sep-20	152
Activity	38	Development of high level layout	8-Sep-20	15-Sep-20	7
WBS	39	C&A			
Activity	40	Retrieval of Drawing /Documents and Review existing DBOOM EDF-1), such as checking C&A	15-Mar-20	14-May-20	60
Activity	41	Site Visit	15-Mar-20	17-Mar-20	2
Activity	42	Site Visit Report	20-Mar-20	25-Mar-20	5
Activity	43	C & A and Safeguarding Strategy input to CSR Report for the Selected options	25-Aug-20	17-Sep-20	23

Simplified Project Schedule (Small Projects)

Optimized Cost Report

- A template for Optimized Cost report with adequate information is developed which provides all necessary information necessary for specific type of project. It reduces the level of efforts i.e., cost, and time.
- With this effort, cost report preparation time of 2 days duration was dropped to 2.5 hour. Helping in significantly reducing the level of effort by 75%

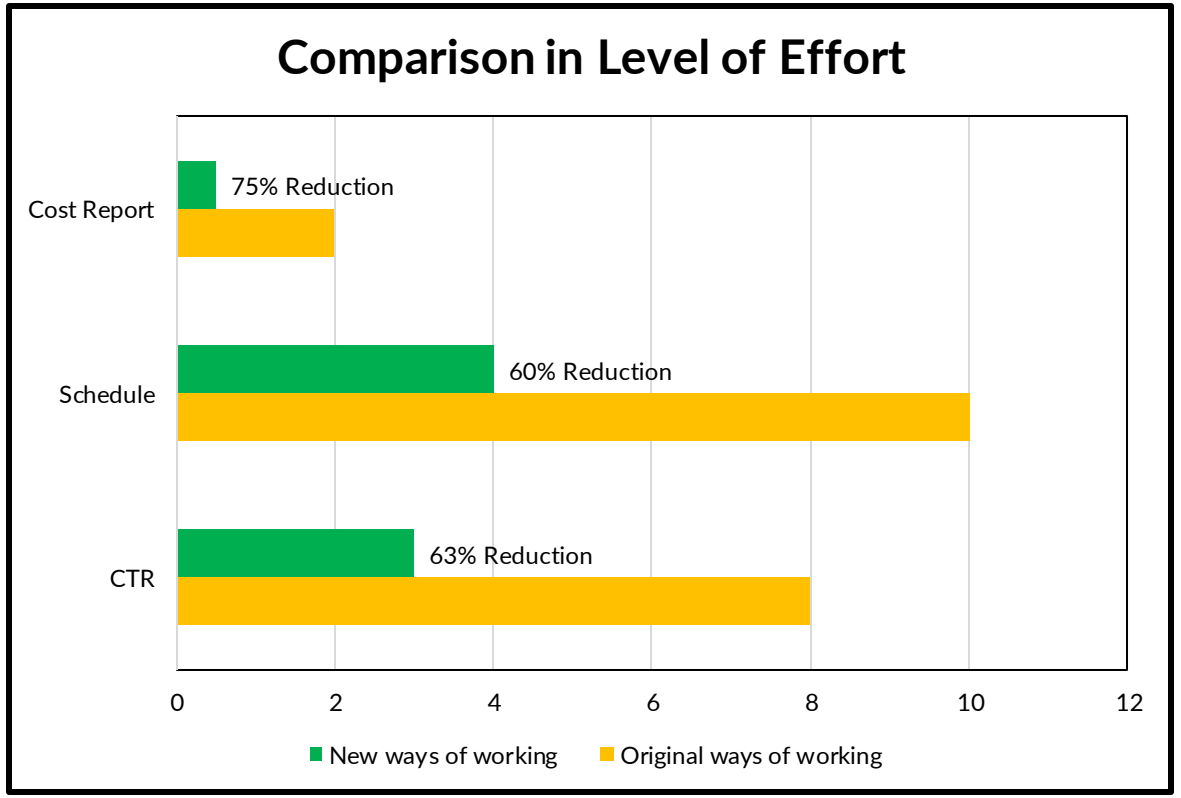
Discipline	Project- XXXX					
	Original Budget	Approved Changes	Current Budget	Planned	Earned	VOWD
PROJECT MANAGEMENT						
HSSE						
PROCESS						
MECHANICAL ROTATING						
MECHANICAL STATIC						
PLANT PIPING						
PIPELINES						
DESIGN SYSTEM ADMIN						
MATERIAL/CORROSION						
ELECTRICAL						
CONTROL & AUTOMATION						
TELECOMMUNICATION						
CIVIL / STRUCTURAL						
FO Manhours						
FO 3rd Party services						
CONTINGENCY						
Overall Project Status						

Optimized One Pager Cost Report

Benefits & Quick Wins

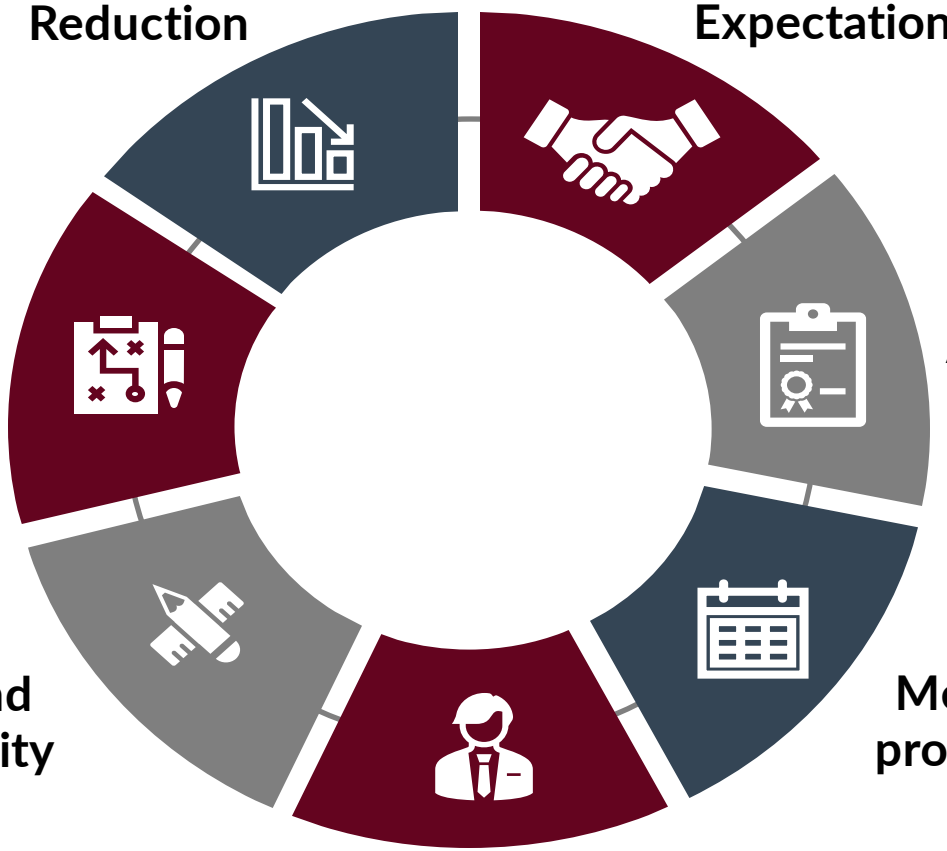
- With the roll-out of Risk Based Controls across FEED Office, it was clearly visible to actualize the significant man-hour reduction in some of the key deliverables produced by Project Controls.

- Reduction in Level of Effort across three key deliverables produced by Project Controls team is reflected in Graph Below,



Pre & Post RBC Implementation

Benefits



Conclusion

- Risk Based Controls helped in define / introduce the key tools to deliver CTR, Schedule and Cost Reports within an agreed timeframe.
- Introduction of Risk Based Controls helped the Project Controls team fulfill the optimal Project Controls Functional support / requirement for various type of projects (with complexity factor, type and/or size) in a faster and effective manner.
- Assisted the team comprehend the client's expectations on the Reporting and Monitoring aspect in line with the in-housed developed Risk Based Controls framework.
- Significant reduction actualized in terms of man-hour / level of effort reduction and timely delivery of key / fit-for-purpose Project Controls deliverables.

Thank You

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