INDUSTRIAL PLANT PROJECT DISPUTES

"Project Management & Frequent mis-steps"

Jaswinder Singh
Technical Director – Process & Power
Diales

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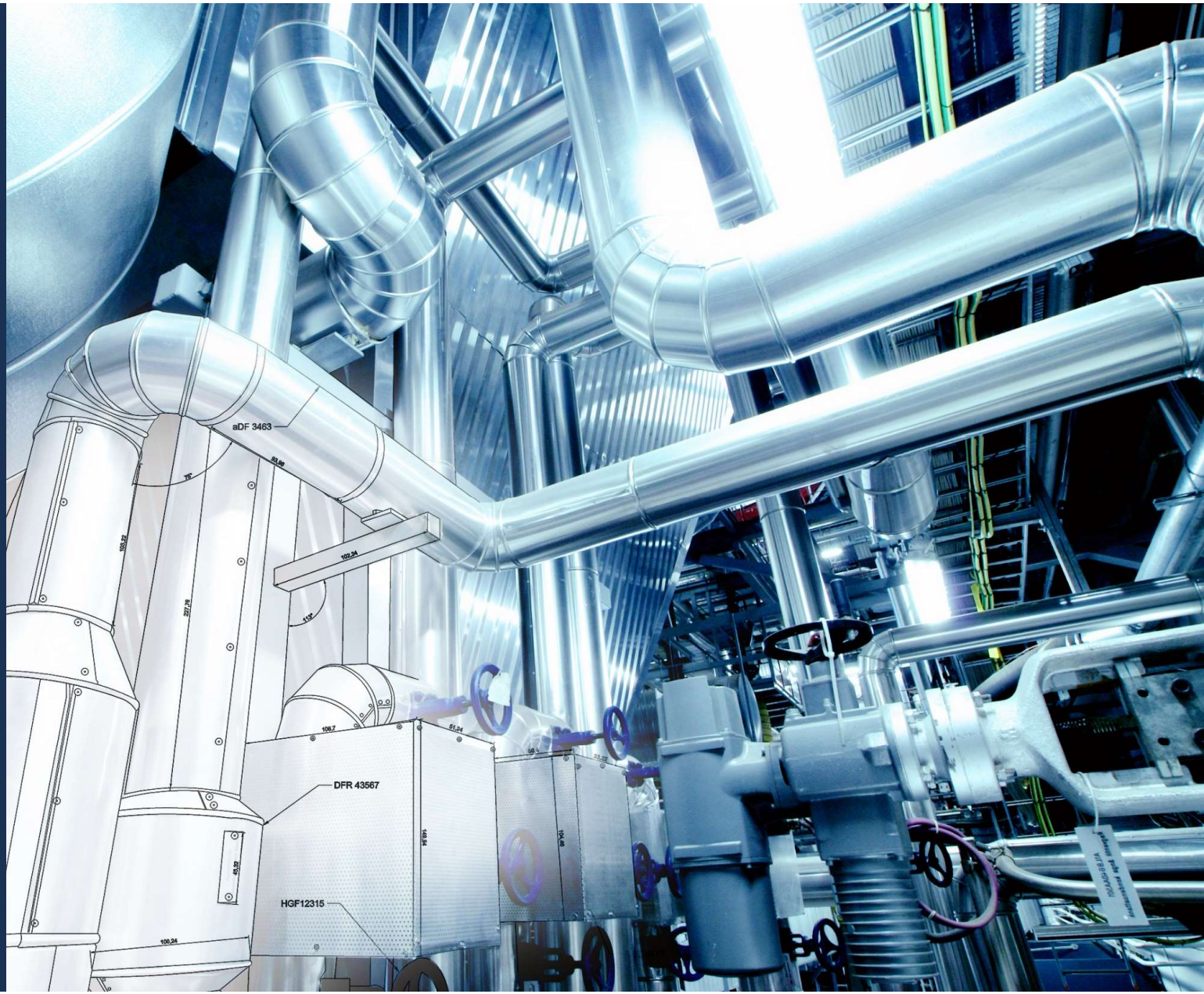


Global Solutions

With offices and teams across five continents, we are able to quickly respond to a local point of need, and provide cost-effective, flexible solutions, tailored to our clients' requirements.

We work together across our offices, to form the teams most suited to our clients' needs.

250+ staff **15+ countries** **5 continents**

Our services

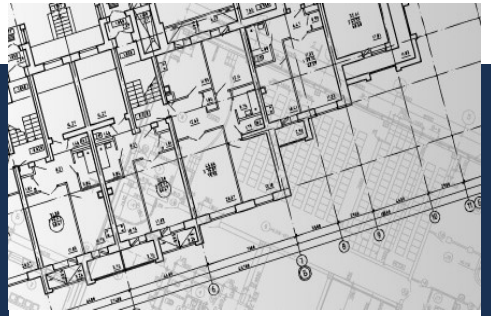
Our support to the legal profession in Arbitration, Litigation, and ADR covers the following disciplines.

QUANTUM

Experts are key in developing soundly reasoned and evidenced reports that can be essential in delivering the desired financial outcome to a dispute or hearing.

DELAY ANALYSIS

It is among the most frequently debated disciplines provided by Expert Witnesses. There are a myriad of techniques, and a wide range of software, that can be used as tools to calculate the 'answer'.



TECHNICAL

Disputes requiring technical expertise often involve an elaborate technical matrix of fact and opinion. Complex investigations, interrogation and interpretation of the cause and impact of various competing causes are required.

PROJECT MANAGEMENT

Diales project management experts have exceptional experience in the standards of practice and services required to be delivered by Contract Administrators and Project Managers.

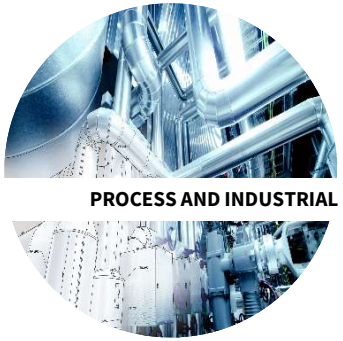
Our sectors

The services we provide to the global engineering and construction industry, covers the following sectors.

MINING

TRANSPORT

OIL AND GAS



PROCESS AND INDUSTRIAL

BUILDINGS

ENERGY

INFRASTRUCTURE

MARINE

INDUSTRIAL PLANT

Any of:

- Chemical Plant
- Power Plant (Nuclear, Waste to Energy, Biomass, Fossil Fuel, etc)
- Oil & Gas facilities
- Petrochemical facilities
- Minerals extraction and processing facilities
- Water treatment facilities
- Waste treatment facilities
- Pharmaceutical facilities
- Etc

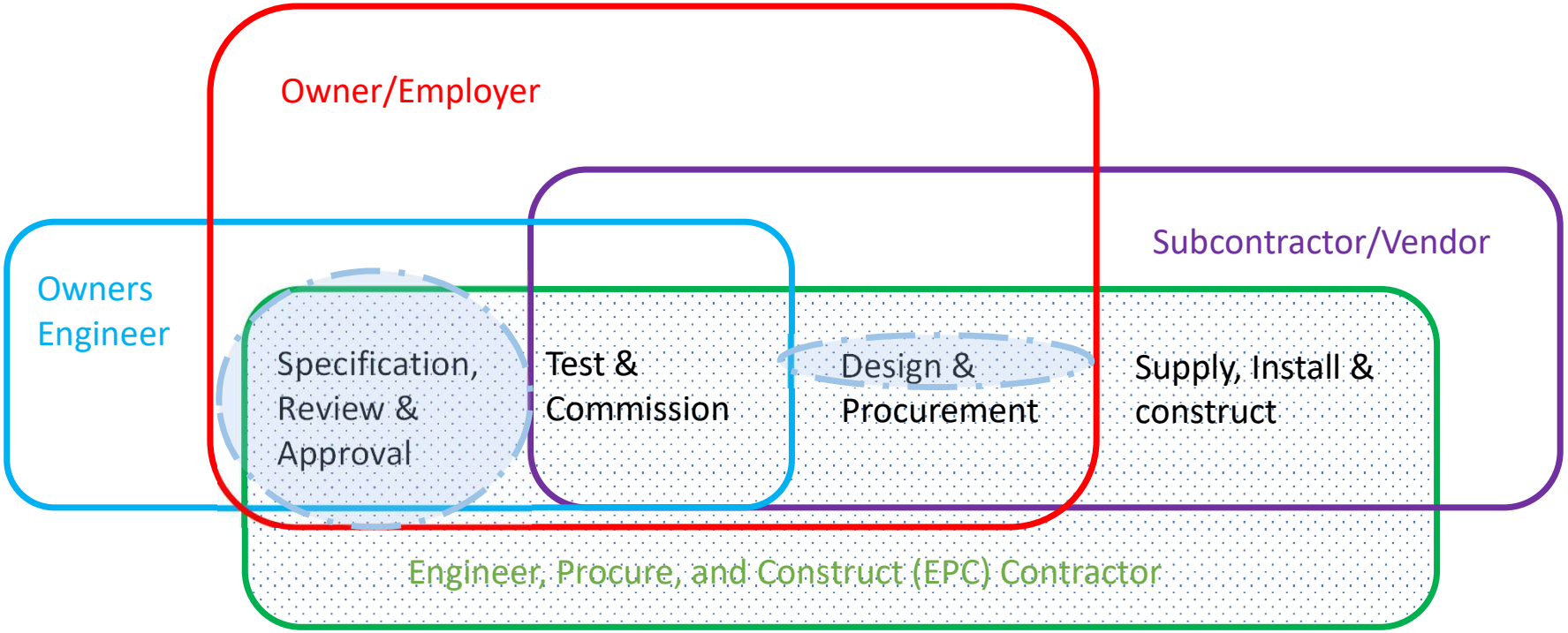
Potential for dispute anywhere where there is Design, Procurement and/or Construction

Nearly always Multi-Disciplinary Projects

EXAMPLE DISPUTE – DESIGNER VS EPC CONTRACTOR

- EPC tendered to build power plant + site infrastructure – Client was local power authority
  EPC was not specialist in this type of plant.
- EPC not skilled in process plant and took on specialist designer to engineer core process and balance of plant
  Consultancy/Design agreement to meet the EPC and Client technical specifications.
- Designer contracted to deliver design by an agreed date – design was to be approved by Clients Engineer.
- EPC acted as interface between Designer and Client and other suppliers.
- Design delivered piecemeal, of poor quality - Initial design submissions were all poor quality and rejected by the Clients Engineer. Design submitted and rejected multiple times.
- Some parts of the design accepted 1-2 years late – some parts of the design not accepted at all.
- Designer ultimately thrown off the project and other designers hired to complete the works.

FREQUENT PARTIES INVOLVED AND RELATIONSHIPS



Crucial that roles/responsibilities for each party is clearly defined, milestones agreed, and suitable contracts put in place.

DISPUTE

Designer claimed	EPC claimed
Contract was terminated unfairly without just cause. It wanted compensation for unfair termination.	It followed the contractual process and had given the required notices for improvement - termination was only after failure of designer to rectify/improve.
Its designs were rejected unfairly. It wanted compensation for rework and unnecessary updating of the design. It claimed time and cost for repeated submissions – it had only allowed for one set of comments.	The designer had agreed to have its design accepted by the Clients Engineer who was independent from the EPC. Repeat submissions were only required because the designers' output was of poor quality.
It could not complete its design/scope because the EPC did not provide it with requested information and in a timely manner. It wanted compensation for delay in completing or not being allowed to finish its work.	It provided all the necessary data in time. The designer was given all the information it needed at the outset, especially for the Concept Design.
It had made many improvements to the tendered design and claimed cost savings. Referring to clause in contract for sharing of cost savings.	It never agreed to any proposed improvements or changes. In any case the changes were 'normal' design development expected at that stage of project.
It had been given instructions for changes that it made. It wanted compensation for Variation Orders.	It never approved any of the changes, nor any VOs, and the Designer implemented these of its own volition.

SO, WHAT WENT WRONG?

- Parties did not recognise (or ignored) stage of the design process when contracts agreed (tendered design was at feasibility level requiring substantial development). Resulted in poorly defined scope.
- If scope definition is poor – then all parties can have false expectations of output. Both parties should have agreed scope definition.
- Wrong contract type selected.

Incorrect contract type, 'Fixed' instead of 'Reimbursable'.

Scope Definition Deficiencies, eg in:

- User requirements
- Standards and guides
- Technical specifications
- Interface definitions
- Existent Design

Quality Assurance Processes, eg:

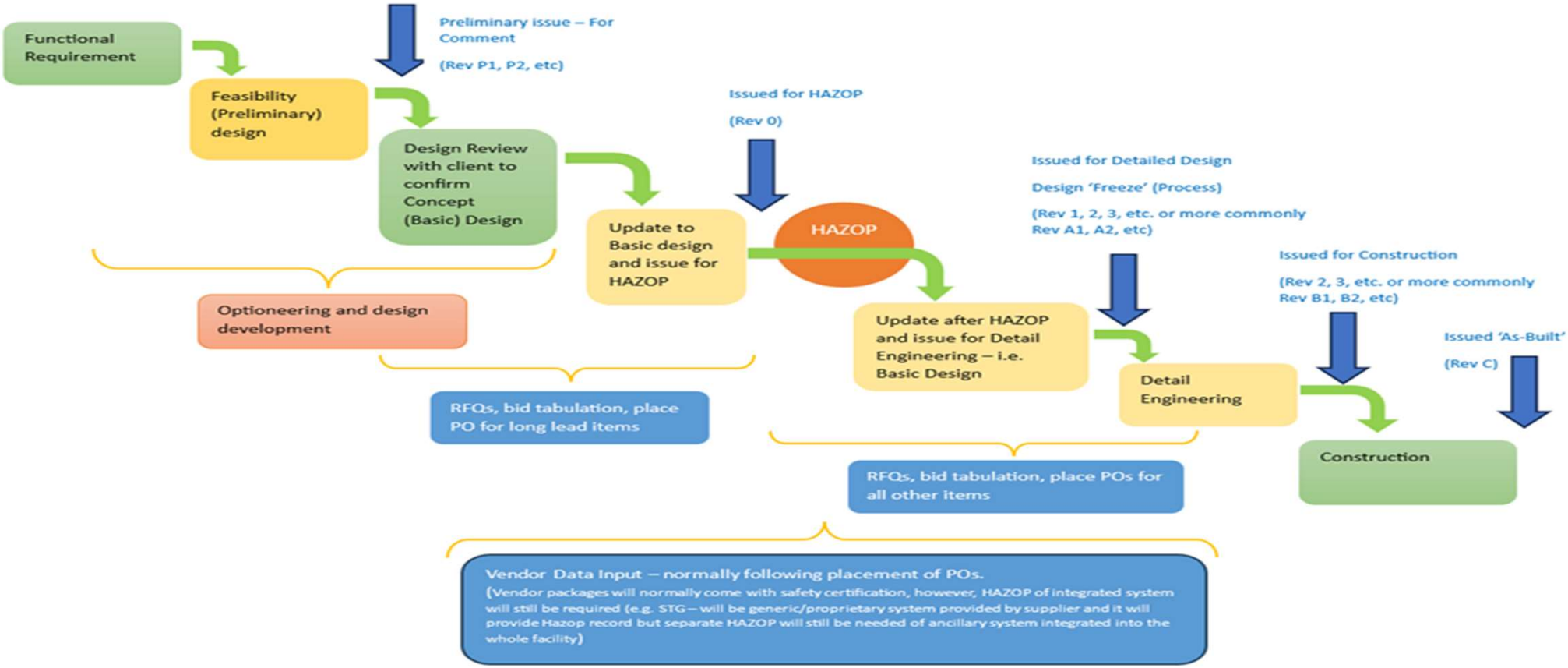
- Project Quality Assurance Plan
- Design Quality Plan
- Basis of Design
- Process safety Management Plan

- Inadequate/No quality assurance documents produced.
- Quality Assurance was not engrained into the Project DNA – inadequate checks and hold points results in errors/deficiencies going into fabrication and construction. EPC not skilled in process plant – but designer (who was a specialist) should have known better.
- Designer (ISO-9001 registered) did not follow its own quality assurance processes.
- Designer agreed to an incredibly tight timescale to produce design for construction (presumably to win the work) and then rushed to get design accepted – issued immature design documents – which were rightly rejected.

Unrealistic commitments

- EPC took on role of interface management (typical normal role) however did not organise all the required management meetings – again QA.
- Poor project communication. Designer refused to attend meetings it had not budgeted for (had not been specified by the EPC). All parties appeared to deal with each other on an arm's length basis. Breakdown in trust and relationships.

RECOGNITION OF THE PROJECT LIFE CYCLE



BASIC CONTRACT TYPES

Contract Type – Must be appropriate for the phase of the project, e.g:

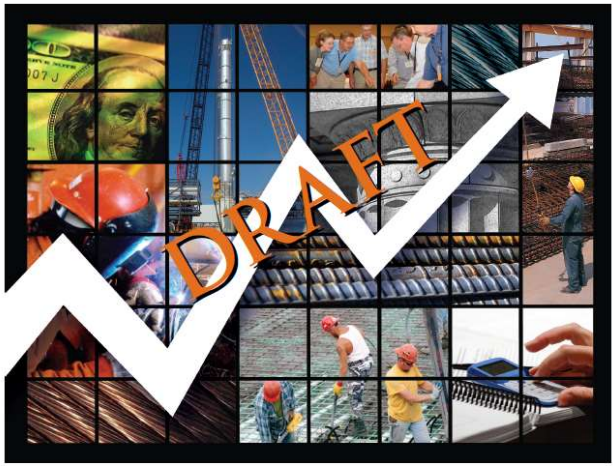
- **Reimbursable (time and materials)** – Best suited to front end design development.
- **Target price with pain/gain share** – Best suited to Detailed engineering.
- **Fixed price** – Best suited to 'build to print', ie construction phase.
- **Or mix** – transitioning from one to another as the project progresses.

Which type to pick is dependent on where the project is in its life cycle, i.e, its definition and the work scope to be contracted. Therefore, it is important to understand the phase of the project and the design maturity.
Most common method used for understanding the design definition or maturity are the Front-End Planning (Loading) process (FEP/FEL) and the Project Definition Rating Index (PDRI).
Guidance for both is available from the Construction Industries Institute.

CII Guidance

Construction Industry Institute®

CII Best Practices Guide:
Improving Project Performance



Implementation Resource 166-3
Version 4.0

Construction Industry Institute®
PDRI

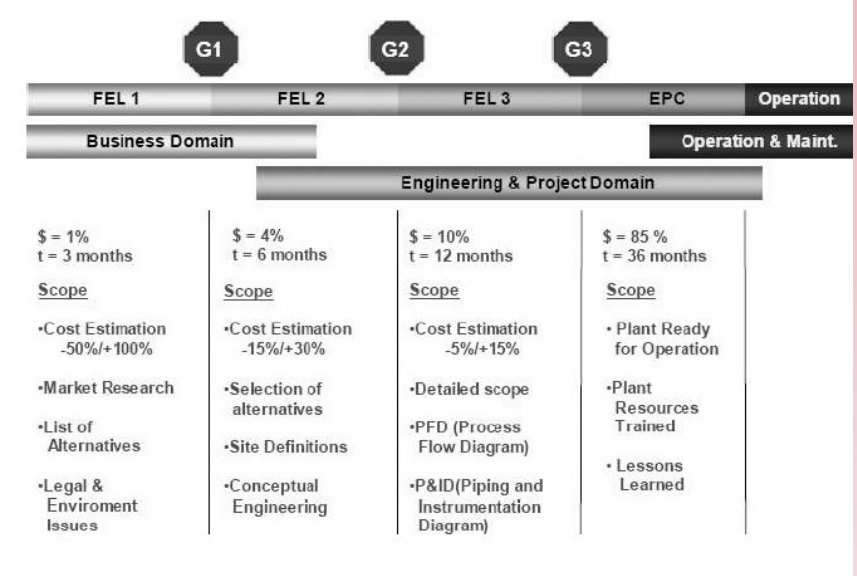
Project Definition Rating Index

Industrial Projects

Implementation Resource 113-2
Version 4.2

Example FEL and PDRI

FEL/FEP and Gates

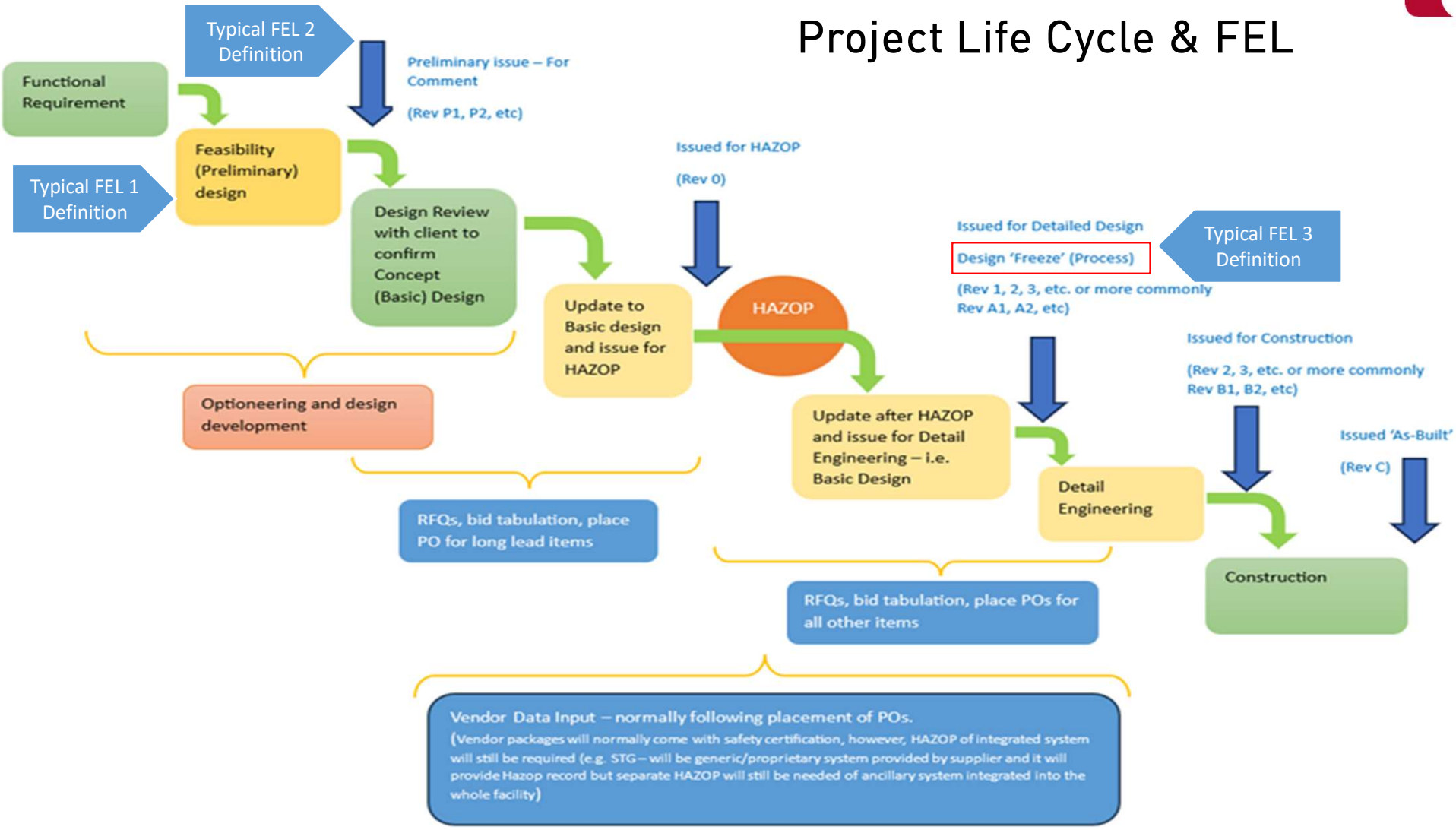


PDRI – Typical Extract

SECTION II – BASIS OF DESIGN							
CATEGORY Element	Definition Level 0	1	2	3	4	5	Score
F. SITE INFORMATION (Maximum Score = 104)							
F1. Site Location	0	2	10	18	26	32	
F2. Surveys & Soil Tests	0	1	4	7	10	13	
F3. Environmental Assessment	0	2	5	10	15	21	
F4. Permit Requirements	0	1	3	5	9	12	
F5. Utility Sources with Supply Conditions	0	1	4	8	12	18	
F6. Fire Protection & Safety Considerations	0	1	2	4	5	8	
CATEGORY F TOTAL							
G. PROCESS/MECHANICAL (Maximum Score = 196)							
G1. Process Flow Sheets	0	2	8	17	26	36	
G2. Heat & Material Balances	0	1	5	10	17	23	
G3. Piping & Instrumentation Diagrams (P&IDs)	0	2	8	15	23	31	
G4. Process Safety Management (PSM)	0	1	2	4	6	8	
G5. Utility Flow Diagrams	0	1	3	6	9	12	
G6. Specifications	0	1	4	8	12	17	
G7. Piping System Requirements	0	1	2	4	6	8	
G8. Plot Plan	0	1	4	8	13	17	
G9. Mechanical Equipment List	0	1	4	9	13	18	
G10. Line List	0	1	2	4	6	8	
G11. Tie-in List	0	1	2	3	4	6	
G12. Piping Specialty Items List	0	1	1	2	3	4	
G13. Instrument Index	0	1	2	4	5	8	
CATEGORY G TOTAL							
H. EQUIPMENT SCOPE (Maximum Score = 33)							
H1. Equipment Status	0	1	4	8	12	16	
H2. Equipment Location Drawings	0	1	2	5	7	10	
H3. Equipment Utility Requirements	0	1	2	3	5	7	
CATEGORY H TOTAL							
I. CIVIL, STRUCTURAL, & ARCHITECTURAL (Maximum Score = 19)							
I1. Civil/Structural Requirements	0	1	3	6	9	12	
I2. Architectural Requirements	0	1	2	4	5	7	
CATEGORY I TOTAL							

Definition Levels
0 = Not Applicable
1 = Complete Definition
2 = Minor Deficiencies
3 = Some Deficiencies
4 = Major Deficiencies
5 = Incomplete or Poor Definition

Project Life Cycle & FEL



ALL PROJECTS HAVE RISKS

- These manifest themselves as delay to delivery and cost increases.
- Parties fail to recognise risks – or more usually risks are ignored *("things will be OK", or "this won't happen" (gut feel!), or "I've never seen this happen", etc*)
- Risk not assigned to the party most suited to manage or mitigate it.
- No mitigations or mitigation plan developed.
- Often 'Risk' is not directly costed or allowed for in the delivery schedule.

Disputes inevitably occur when any risk manifests leading to cost/delay and parties cannot agree who was responsible for managing it.

AVOIDANCE OF DISPUTES

- Understand the maturity of the design.
- Agree scope definition documents appropriate for the design maturity.
- Produce quality assurance and management processes, implement and enforce.
- Recognise the actual time to produce, review and accept – don't drive/accept unrealistic timescales.
- Understand the risks and assign owners – manage proactively!
- Agree 'contingency' and 'risk' pots of money and draw down mechanisms.
- Select contract form recognising the design maturity and associated risks.

- Have regular design reviews with all relevant parties – agree changes, and changes to scope, and apply formal process – don't rely on verbal or email instructions!
- Accept there will be change and proactively manage this – don't leave until the end!
- Produce a resource loaded delivery schedule, establish a critical path, update regularly - especially with agreed changes. Transparency between all parties.

Diales

AMERICAS
T: +1 (917) 415 9484
E: info@diales.com

ASIA PACIFIC
T: +65 (0) 6226 4317
E: info@diales.com

EUROPE
T: +44 (0) 207 377 4944
E: info@diales.com

MIDDLE EAST
T: +971 (0) 4 551 5392
E: info@diales.com

www.diales.com