



Peterborough Ground Frame Panel – A Novel Design Development Approach

Presented by
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About ME



SNC-Lavalin, Atkins India

Signalling Engineer



Personal

- Married to Signalling Engineer
- Mother of two (Lakhith & Laira – Twins – 2 yrs)



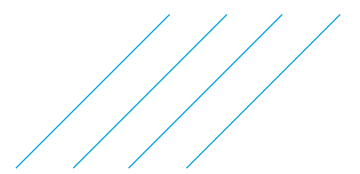
Professional

- BSc, MCA(Hons), MBA
- MIET, IEng, AMIRSE
- 10 years Signalling Experience
- 2 year Project Management

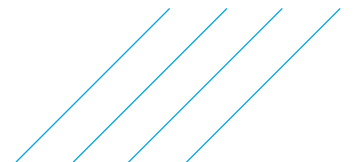
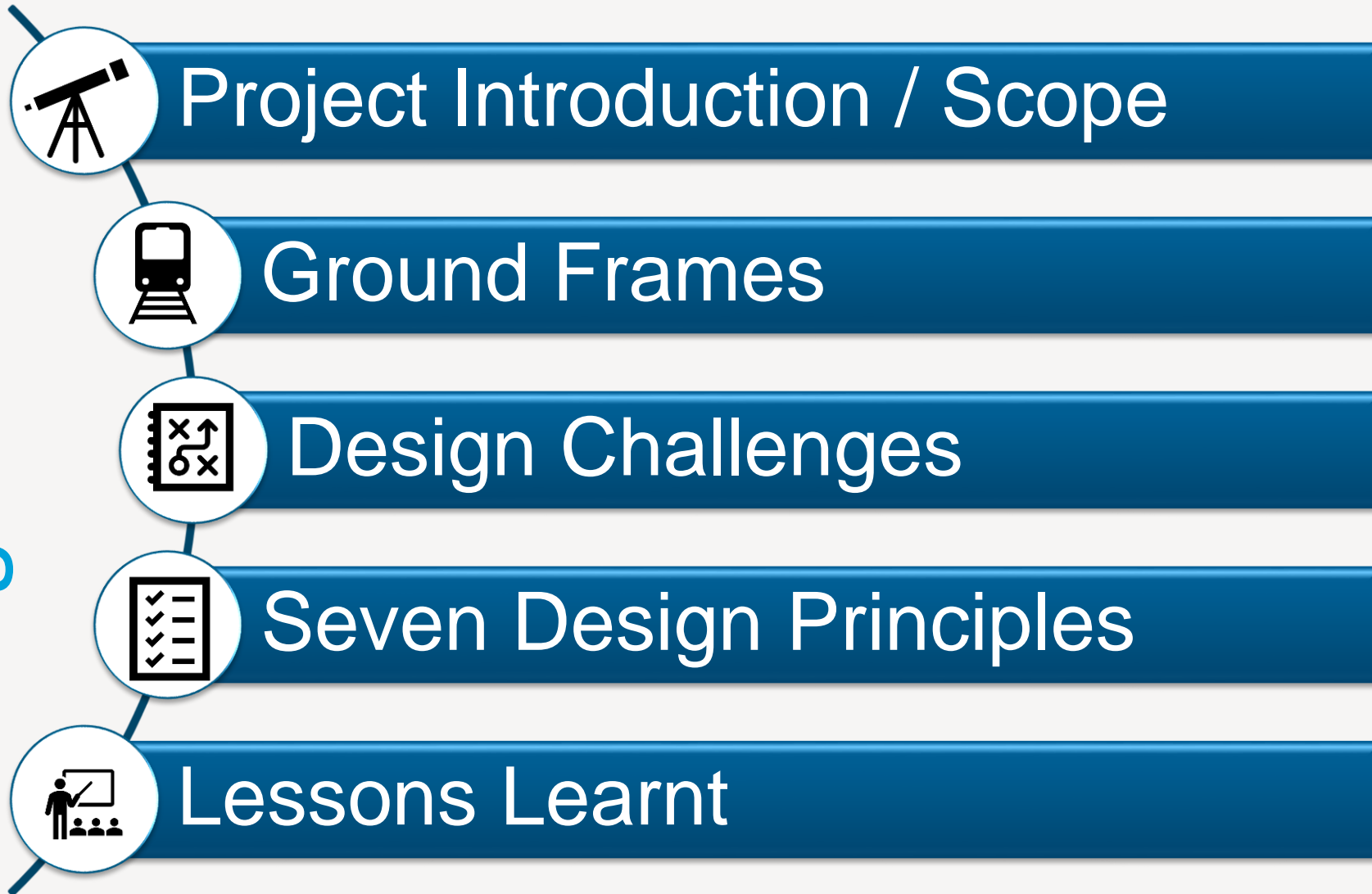


Others

- Innovative Thinking
- Professional Development & registration
- CSR



Agenda



Project Background

Peterborough Signal Box Control Area

East Coast Main Line

75 miles North of London

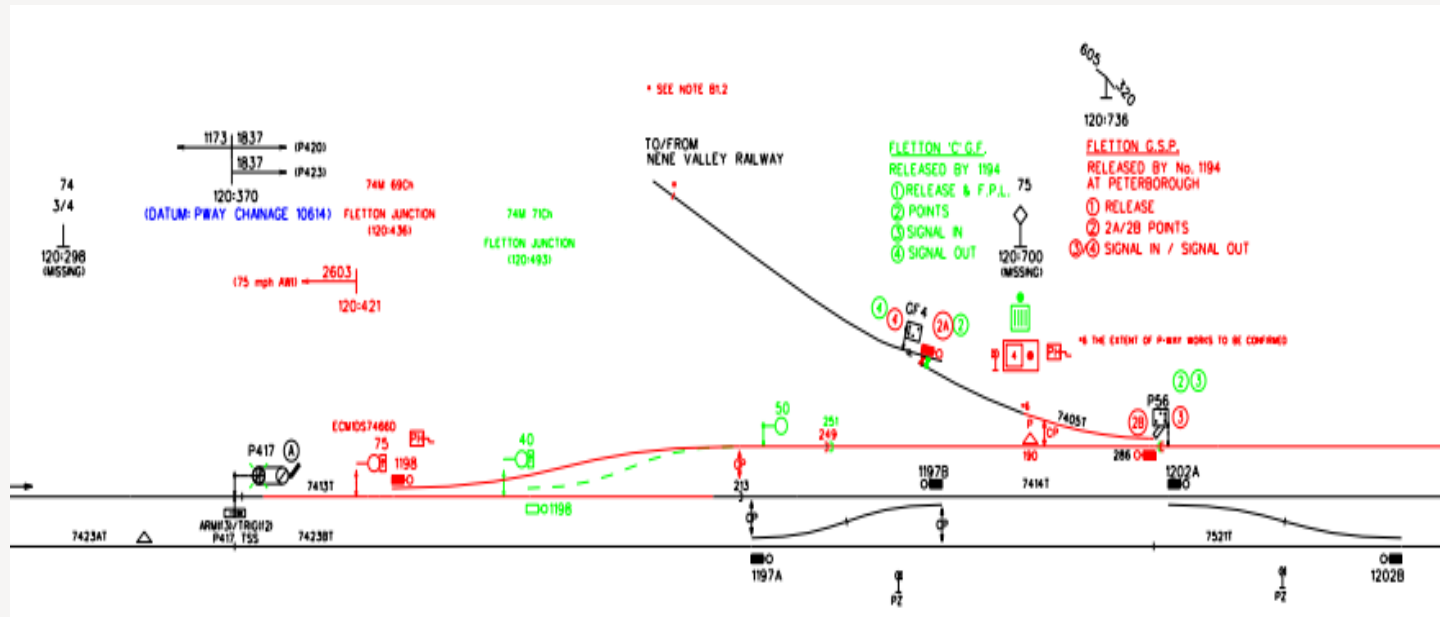
Line Speed Enhancement

Alternate Routing to Platform 4



Scope for Detailed Design

- › Renewal of 1198 Points and Introducing flashing sequence for the high speed divergence
- › Conversion of Mechanical Points GF 2 to Electrical Machine Operated Points with a Ground Frame Panel



APPROXIMATELY

5000

DESIGN MAN HOURS

TURNOUT SPEED INCREASE

40=>75

MILES PER HOUR

COMMISSIONING IN

5

STAGE WORKS

% OF DESIGNS

95%

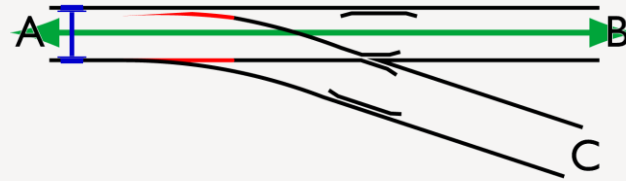
DELIVERED BY GDC



Mechanical Ground Frame - Existing



- ❖ Ground Frames – Local Operation of sidings points.
- ❖ Points are movable switches in the track layout.

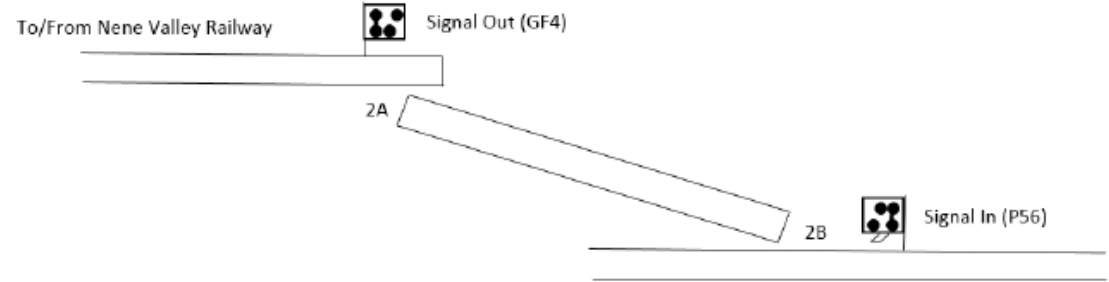


- ❖ Mechanical Ground frame prevents conflicting movements using mechanical interlocking of levers.
- ❖ Ground Frames provides safety benefits over manual verbal operation.
- ❖ Lever Locking is simple concept.
- ❖ Mechanical Ground Frames are very common.

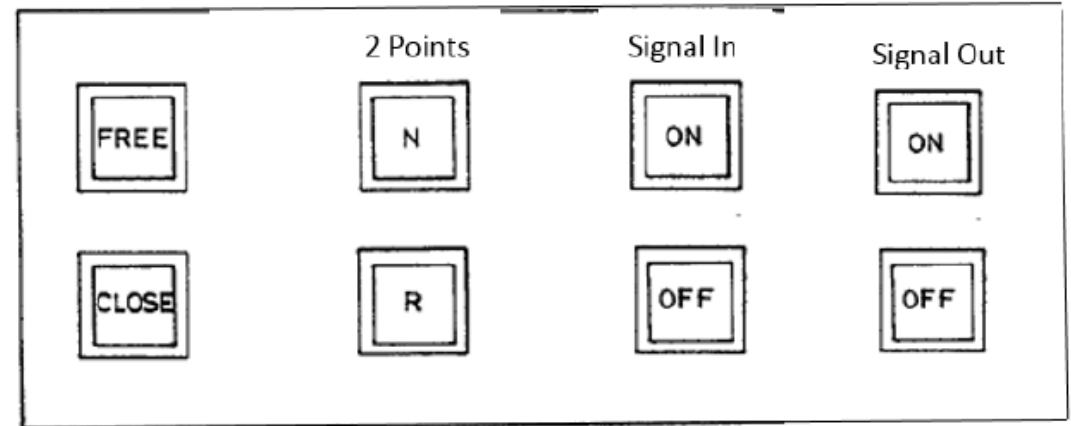


Electrical Panel Ground Frame - Proposed

- ❖ Difficult to pull longer points using Mechanical Levers
- ❖ Client remit for an Electrical Push Button Panel.
- ❖ Electrically controlled Points and Signals.
- ❖ Push button circuitry to be designed.
- ❖ Mini-Interlocking to be designed for safe circuit operation.



Example Panel:



Challenges



Client

- Existing anomalies & deficiencies.
- No change to be made to Main interlocking – programme / commercial constraint

Design

- Limited examples due to rare use of Ground frame panel in UK.
- Typical drawings don't cover project requirements

Time

- Challenging timelines for all design phases

Seven Design Principles

Understanding and clarifying the project

1. Fully understand customer requirements.
2. Assess resources are required and confirm availability.
3. Split scope of work into appropriate phases
4. Agree roles and responsibilities

Quality control measures to assist in undertaking the project

5. Processes for managing change, risk and information flow.
6. Ensure deliverables meet the design requirements.

Enhancing and improving the business on completion of the project

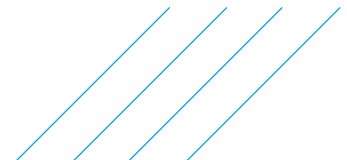
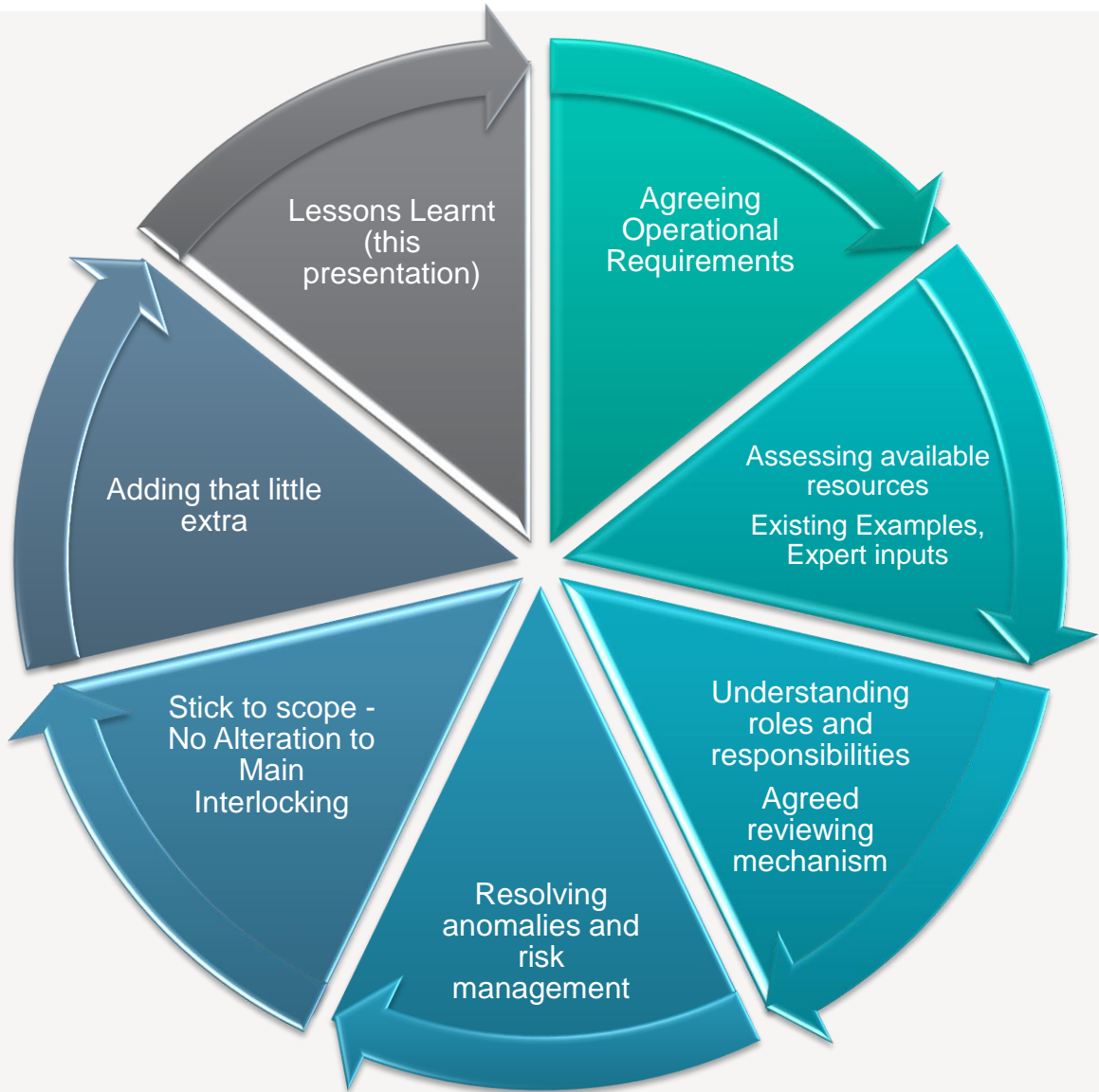
7. Lessons Learnt into future projects





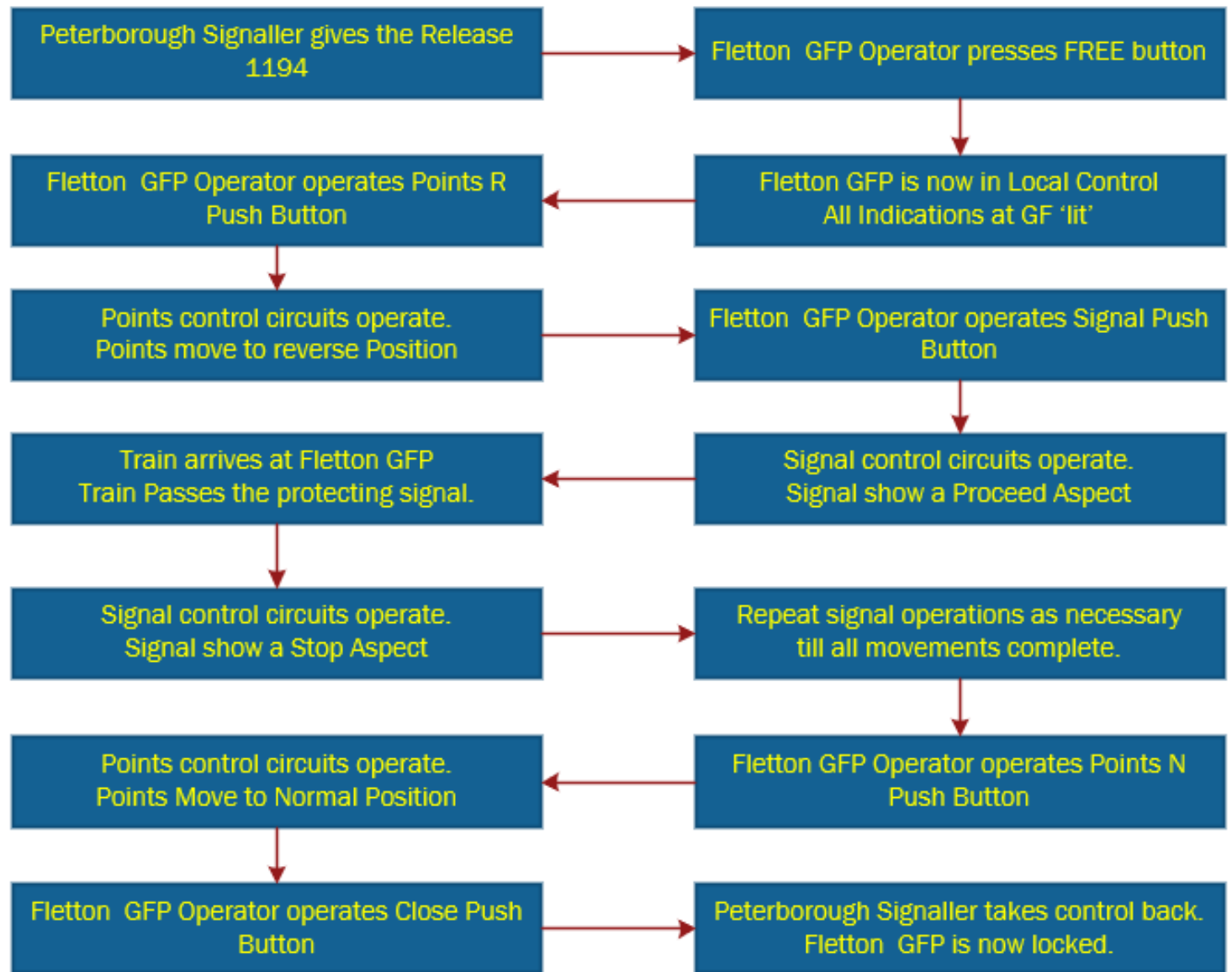
Design Planning and Execution

After correctly understanding project requirements, a proactive approach using the seven design principles has been adopted to plan the design strategy and deliver within the timescales.

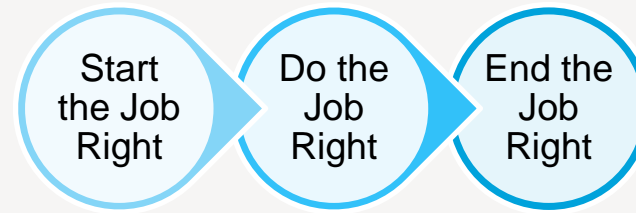


Sequence of Operation

The flow of circuits / events in a typical scenario; to explain the complex circuit operation easy enough to understand by everyone.



Lessons Learnt



Manage unknown Client technical requirements and get agreement at the beginning

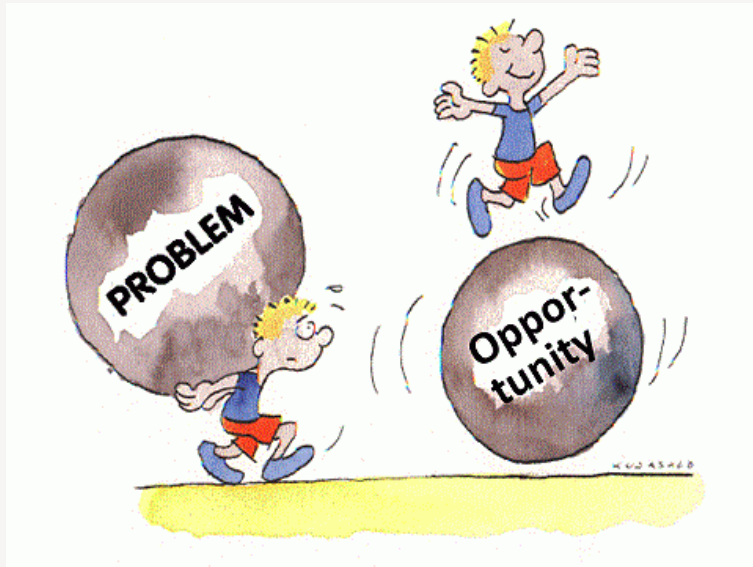
Clear strategy for development of novel circuit review & approval

Discussion at regular interval with mentor & senior

Supporting documentation such as Flowchart to understand circuit of operation



Conclusion



"Every Problem is an Opportunity".

