



Last Planner System in an infrastructure project

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Background



- Last planner system (LPS)
 - Glenn Ballard and Greg Howell were the ones that invented the LPS and took the lead for its improvement over the last three decades (since 1992)
 - The main focus of LPS is to decline the uncertainty and variability in workflow that have been neglected in traditional project management
 - The LPS also seeks to improve the predictability of the planned activities on the construction site
 - Since the establishment of the LPS by Ballard and Howell, multiple studies have been conducted to evaluate the implementation of LPS in many construction projects.

Research gap

- Few studies have recorded the implementation process in infrastructure projects.
- Less attention has been paid to the behavioural aspects of practitioners during the LPS implementation.

Research questions

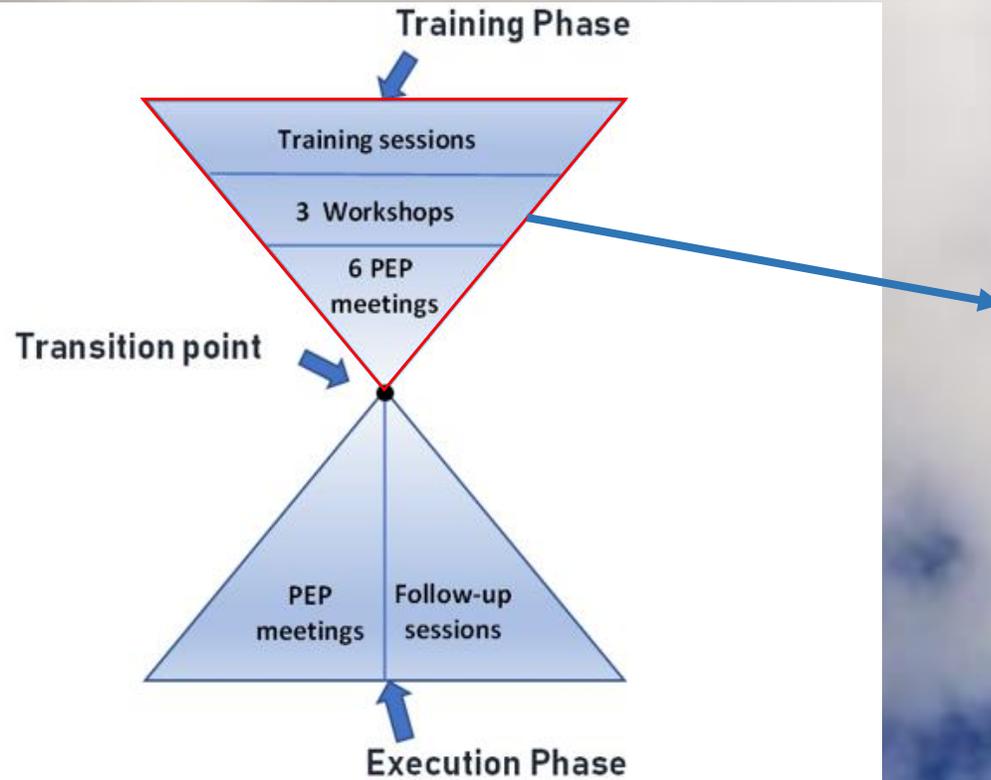
- How is PNC going to implement The Last Planner System (LPS) in Minnevika Bridge project?
- What are the challenges that arise during the implementation of LPS?

Research methodology



- 1- Comprehensive literature review
- 2- Participant – observations
- 3- Non-participant – observations
- 4- Six semi-structured interviews
- 5- Two surveys

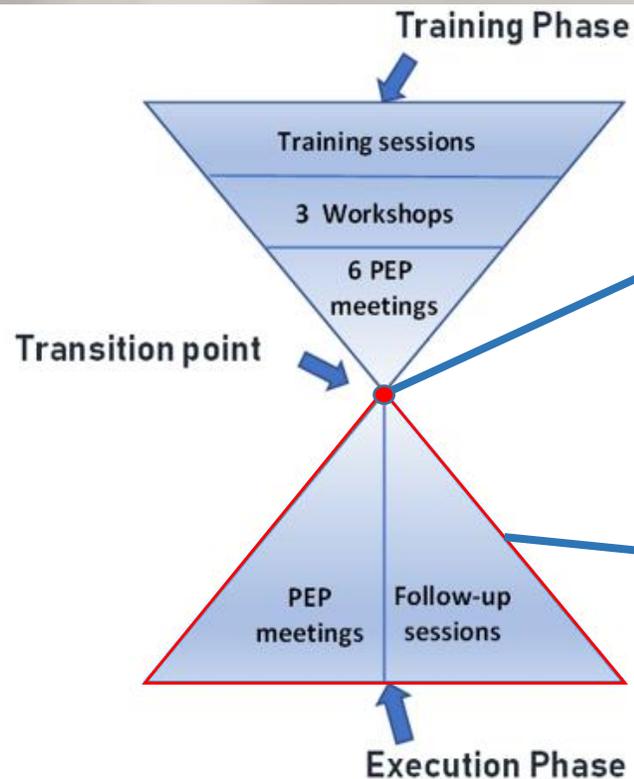
Results and discussion



- **Training Phase (Responsibility of the Trainers)**
 - **Training sessions**
 - Theoretical explanations and used “Villego Simulation” game.
 - **Three workshops**
 - Introduction to the five Lean principles.
 - Introduction to process mapping
 - Made the phase schedule
 - Started planning the six weeks lookahead
 - Carried out the risk matrix and action plan
 - **Six PEP meetings**
 - The project team established the weekly work plan (WP).
 - Used Key Performance Indicators (KPIs) learn from mistakes

The LPS implementation in Minnevik Bridge project

Results and discussion



- **Transition point (Responsibility of the Trainers)**
 - The Trainers handed over the system to the Facilitator and the process expert

- **Execution Phase (Responsibility of the Facilitator)**
 - **PEP meetings**
 - The LPS Facilitator controls the system with the help of the process expert by using the same steps learned in the 6 PEP meetings.
 - **Follow-up sessions**
 - The Trainers agreed with the project team to carry out follow-up sessions to make sure that the implementation process is on the right track.

The LPS implementation in Minnevik Bridge project

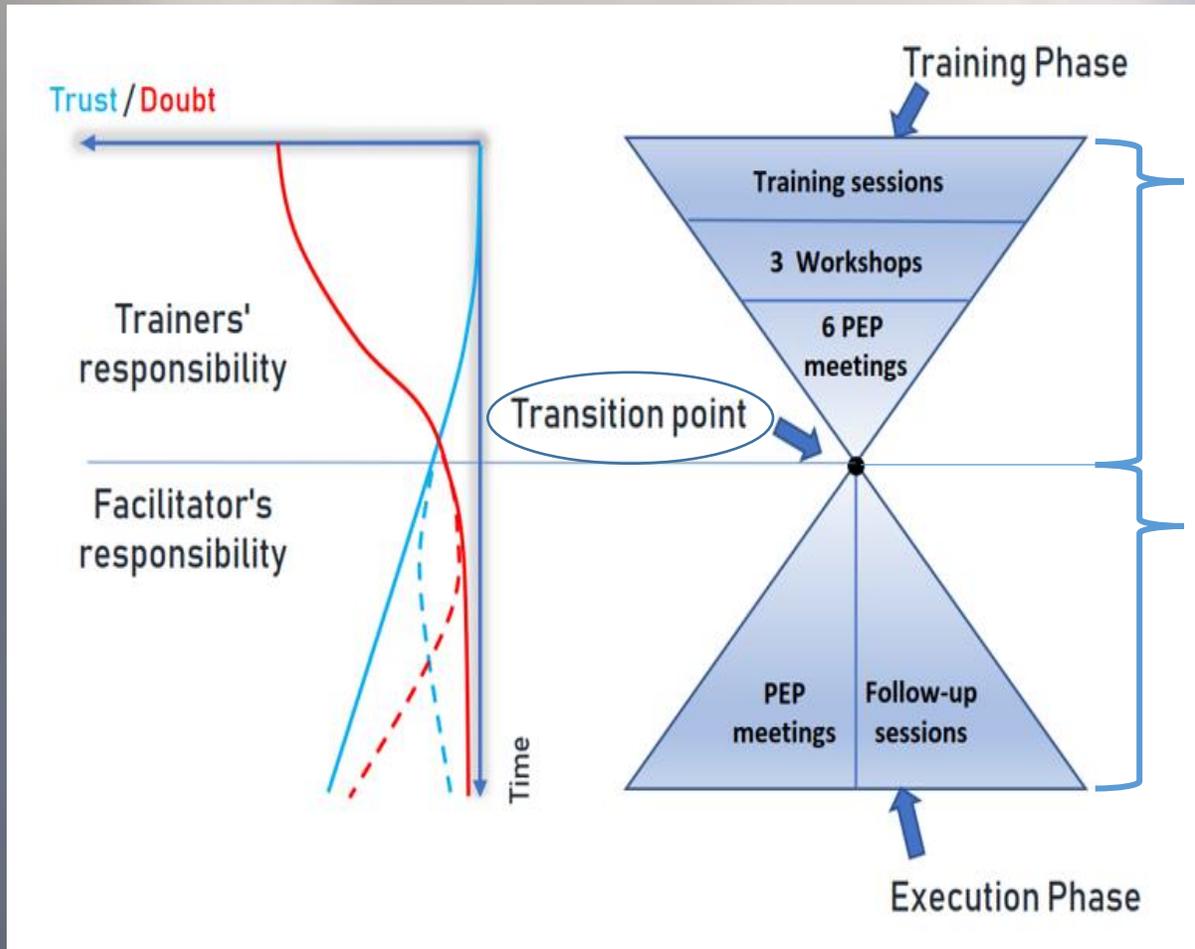
Results and discussion



Challenges and suggested measures

- 1) Language barriers (During the Training Phase)
 - Measures: Presentation of the commitments by the Last planner at the end of the PEP meeting to assure understanding of what they have committed to and definition of the team rules.
- 2) Newcomers to the PEP meetings (During both phases)
 - Measures: The Trainers or Facilitator demonstrated the LPS to the newcomers into detail to reach an equivalent level of knowledge with other participants.
- 3) Fear of responsibility when making the commitments (mainly from lower-level management) (During both phases)
 - Measures: Internal agreement/discussion within different companies about the minimum experience needed to be in the PEP meetings in order to make reliable weekly plans.

Results and discussion



- 4) Participants' resistance to the system
 - Cause: Doubts towards the LPS
 - Measure: Diminish the doubts
 1. Sufficient training
 2. Openness towards the LPS
- 5) Maintaining the participants' commitment
 - Measure: Maintain the established trust
 1. The Facilitator should be cautious when using the KPIs
 2. Use the follow-up sessions

Conclusion / lessons Learned



- Infrastructure projects and other construction projects tend to meet similar challenges in the Training Phase
- Full implementation is not enough for a successful system
- Well experienced Trainers are vital
- Openness towards the system is a requirement from all.
- The facilitator should help with maintaining the trust by using the incremental strategy at the beginning of the Execution Phase.
- Further study: the impact of the follow-up sessions



Thank you!