Electrical Safety Project Annual Review

15/11/2024

V. Barbet, B. Lefort, C, Mugnier, J.Ridewood, R. Tegas, J, Panigoni, D. Ribiollet.

Project Structure

WP1 Project Management

WPL: A. L. Perrot
WPL deputy: C. Mugnier

WP2 HSE Branch

WPL: C. Delamare
HSE-TS

- WP2.1: Rules
  (WPL: A. Henriques HSE-OHS)
- WP2.2: Certification
  (WPL: J. Gascon HSE-OHS)
- WP2.3: Qualification
  (WPL: I. Neuhold HSE-OHS)
- WP2.4: Inspection & Non- Conformities
  (WPL: C. Delamare HSE-TS)

WP3 Systems Compliance with Standards

WPL: L. Scibile
TE-HDO

WP4 Intervention Management

WPL: B. Lefort
BE-OP

- WP4.1: Electrical Risks (identification / classification)
- WP4.2: Processes
- WP4.3: Lock-out

J, Panigoni, D. Ribiollet.

WP5 Electrical Distribution Network

WPL: G. Podoleanu
EN-EL

- WP5.1: Equipment Responsibility
  (WPL: K. Papastergiou SY-ABT)
- WP5.2: Drawings & Schematics
  (WPL: K. Zielinski EN-EL)
- WP5.3: Identification in field
  (WPL: C. Mugnier – ESP CT*)

WP6 Electrical Data Management

WPL: L. Pater
EN-IM

- WP6.1: Documentation
  (WPL: t.b.d.)
- WP6.2: Data Bases & Electrical Safety Portal
  (WPL: L. Pater EN-IM)
- WP6.3: Electrical Knowledge Dissemination
  (WPL: ESP CT*)

(*) ESP CT: Electrical Safety Project Core Team

WP4: Intervention Management

Michael Conway →

WP4 Contributors	Dept. Group
B. Lefort, J. Ridewood, V. Barbet	BE
J. Panigoni, N. Mornand, J. Etheridge	EN-ACE
O. Crespo, S. Deleval	EN-CV
D. Ribiollet	EN-EL
J. Borburgh, V. Montabonnet, R. Tegas	SY
M. Pezzetti, T. Barbe	TE-CRG
D. Bozzini (G. d'Angelo)	TE-MPE
t.b.d.	TE-MSC
G. Pigny, R. Ferreira	TE-VSC
J. Fernandez	On behalf of ATS DSOs
O. Beltramello, J. Devine, L. Di Giulio,	EP-DI
G. Velazquez, L. Roy	LEXGLIMOS
C. Delamare, J. Gascon	HSE
C. Mugnier, A. L. Perrot,	ESP Project Office

Planning Vs Reality

WP4.1: Electrical Risks

2023 Slide!

Jan. 2024

Groups Survey (risks, use-cases, procedures…)

(GROUPS → WP4.1)

Apr. 2024

Testing classification on real equipment / data

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(WP4 → WP6)

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(WP2 ←→ WP4)

Mar. 2024

HSE Validation

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4.1 → 4.2 for process definition (TBC)

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Testing the *processes* before LS3 (Nov. 2024)

→ manpower needed beginning of 2024!

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Presentation: https://indico.cern.ch/event/1422878/

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EDMS: https://edms.cern.ch/document/3138825/0.3

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2023 Slide!

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2023 Slide!

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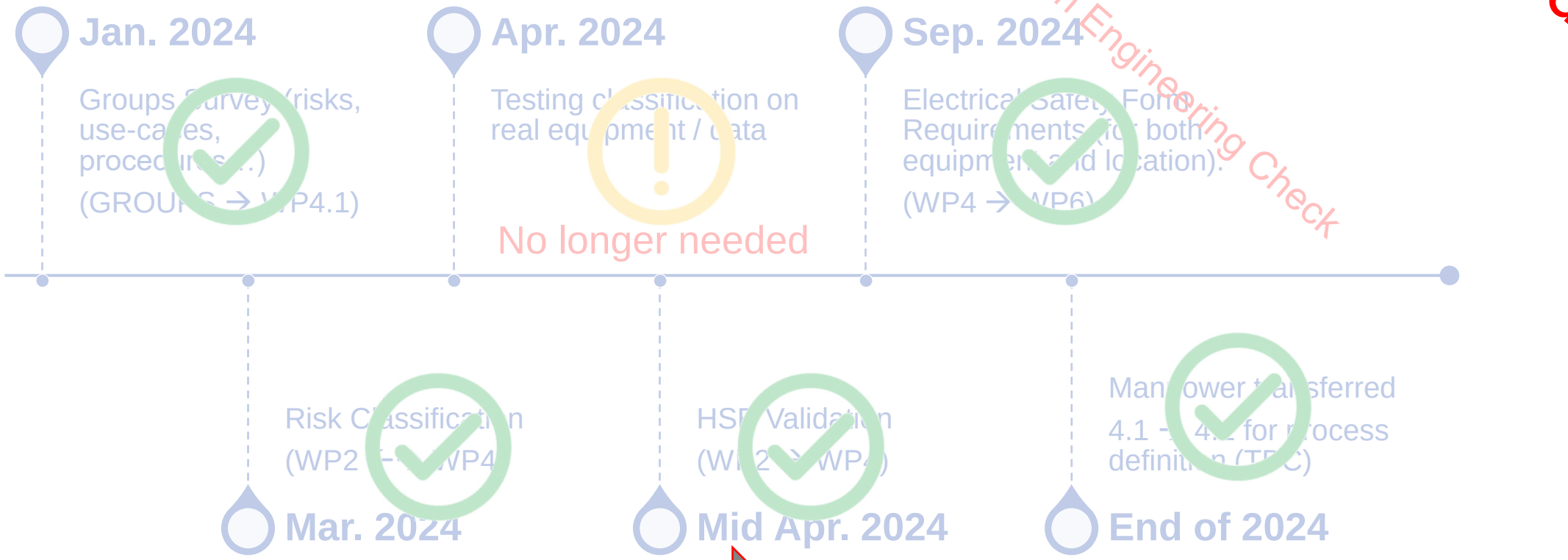
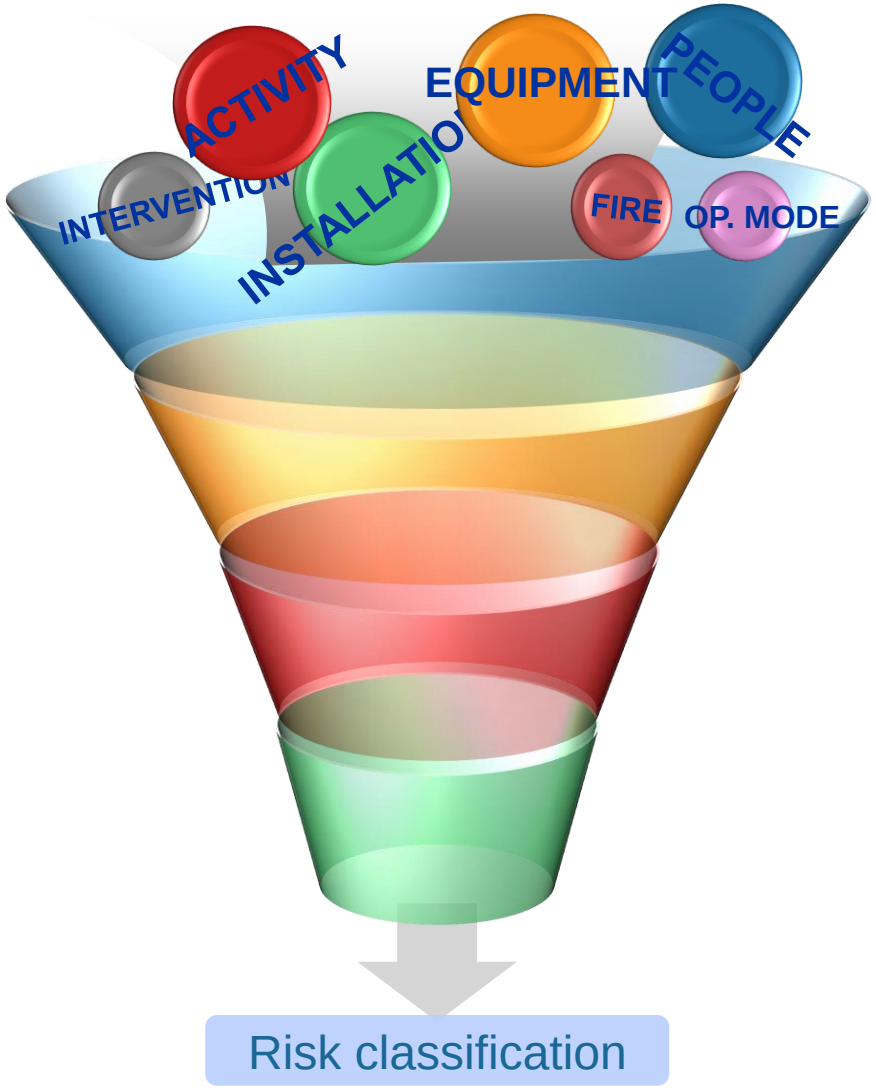


Next Step ?

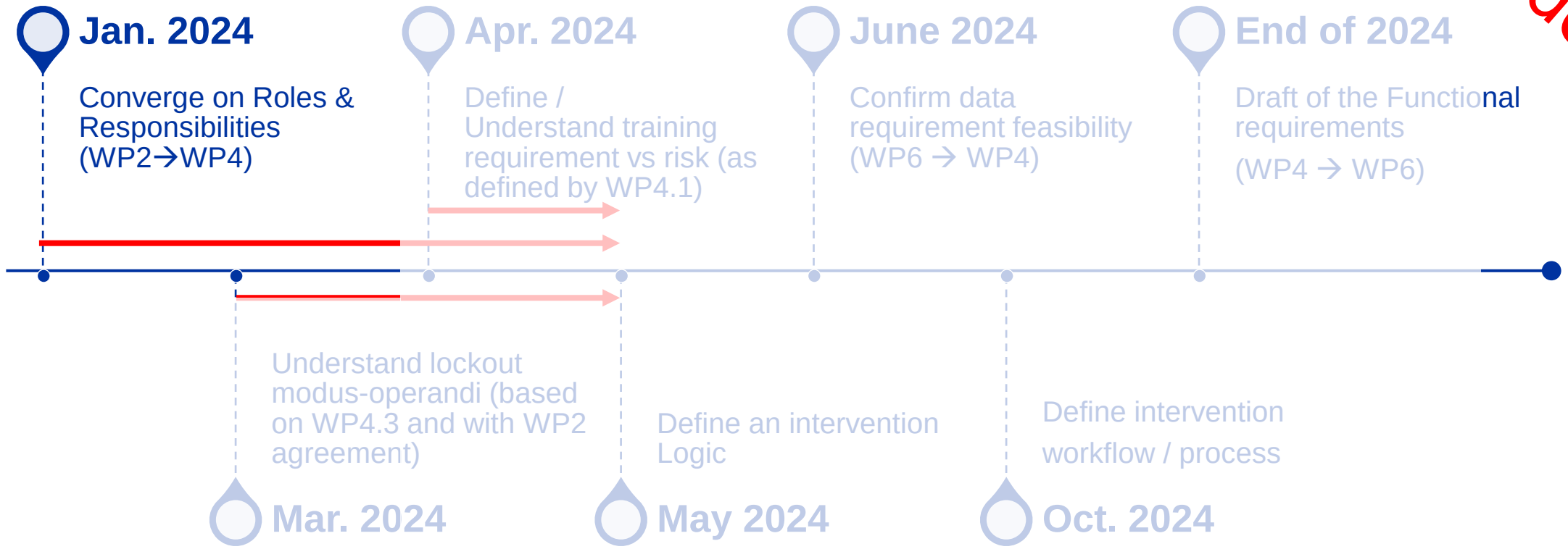
- Eng. Check: Review with the latest Contributors comments
- Agreement (in principle) of the EDMS document by the Group Leaders
- Use the “Identification and classification of electrical risks” during the Pilot.
- End of WP4.1
- Manpower transferred to WP4.2 (Please Valerie !)



Credit : Raffaele TEGAS

WP4.2: Processes

2023 Slide!



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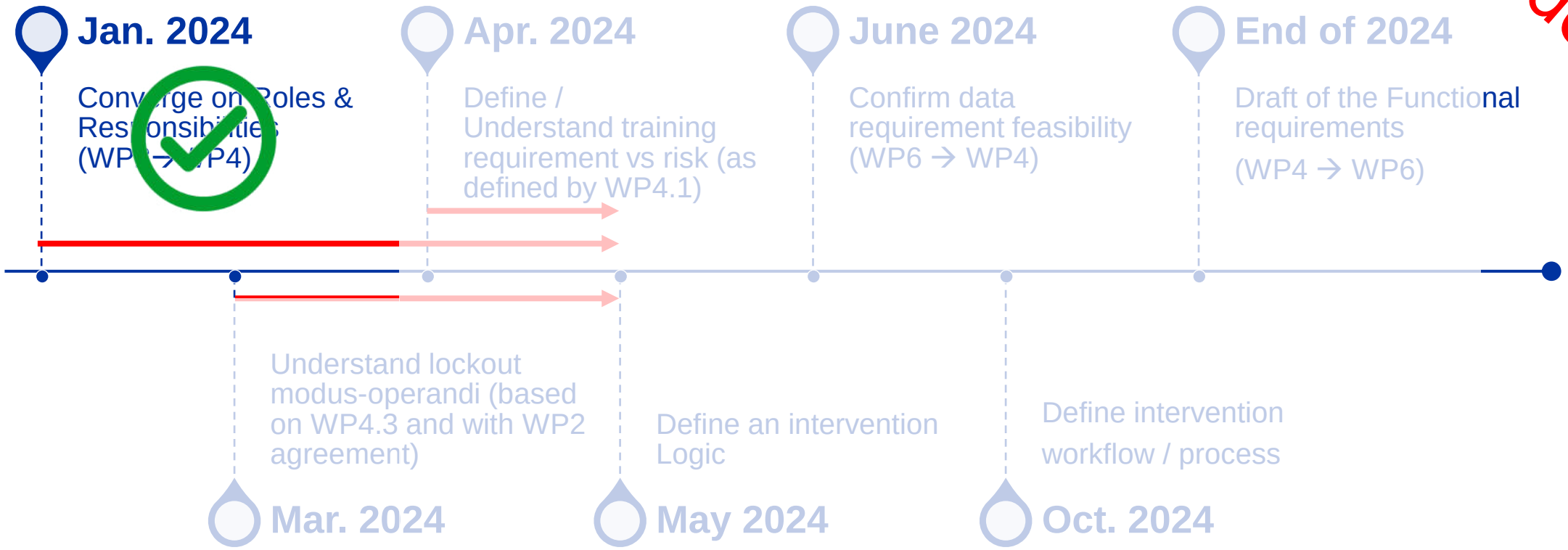

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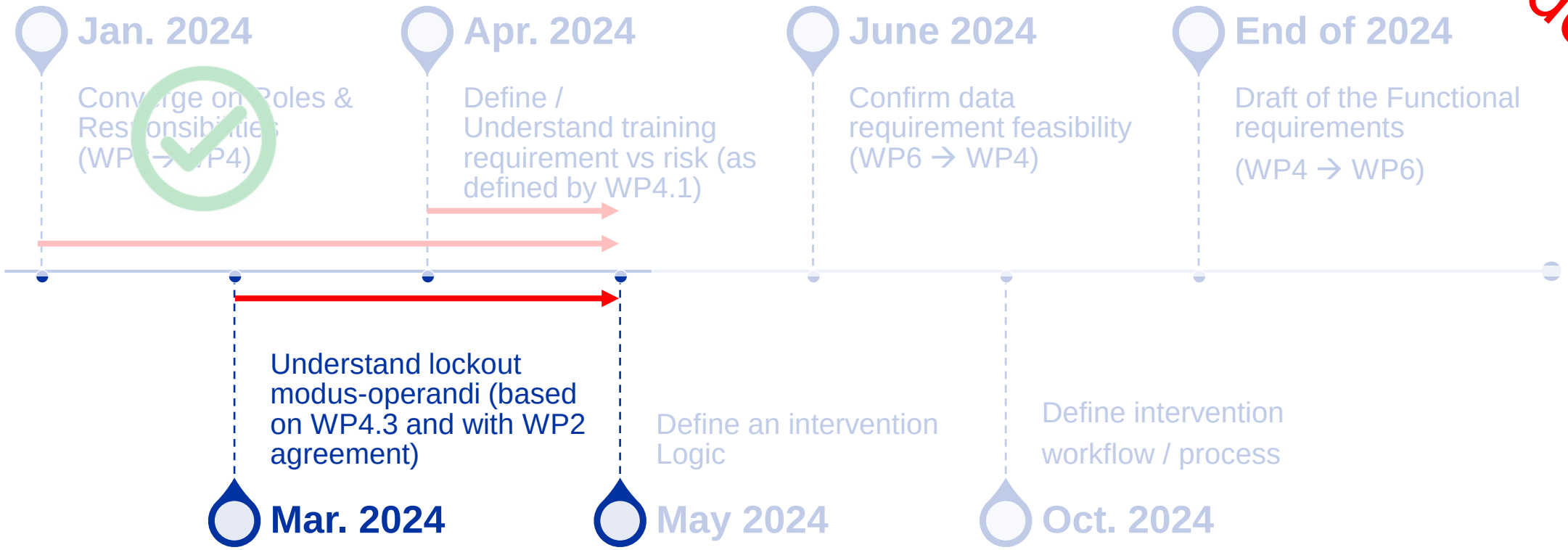

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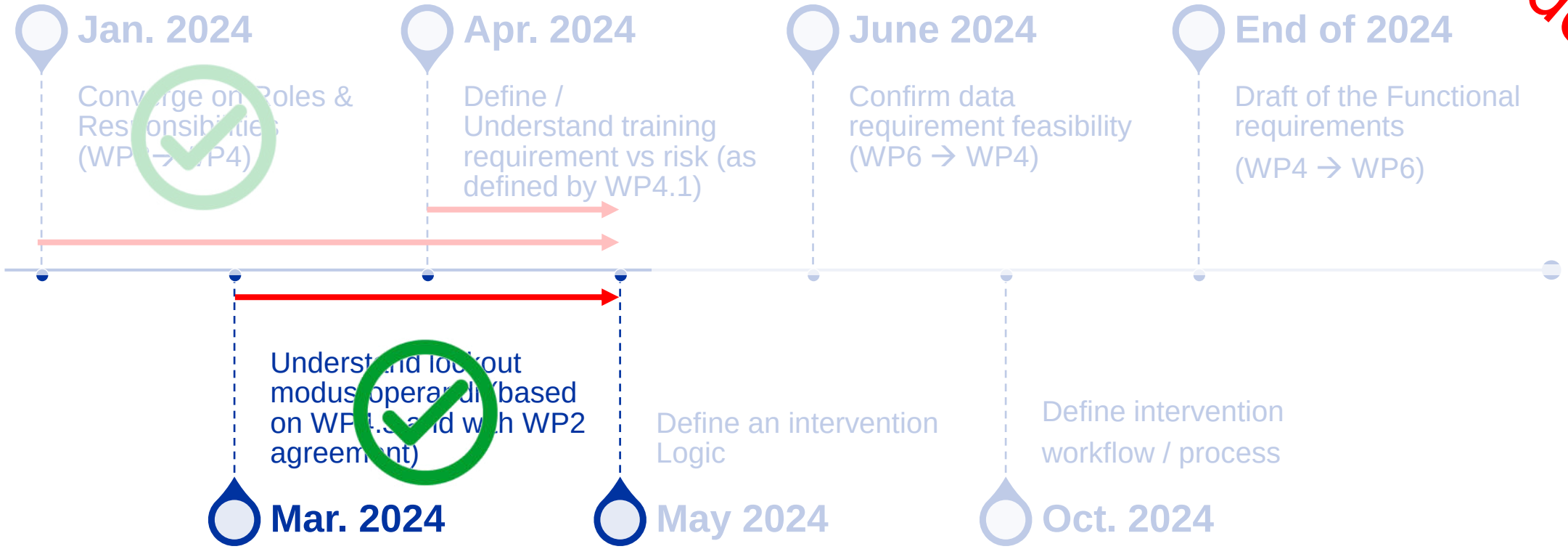

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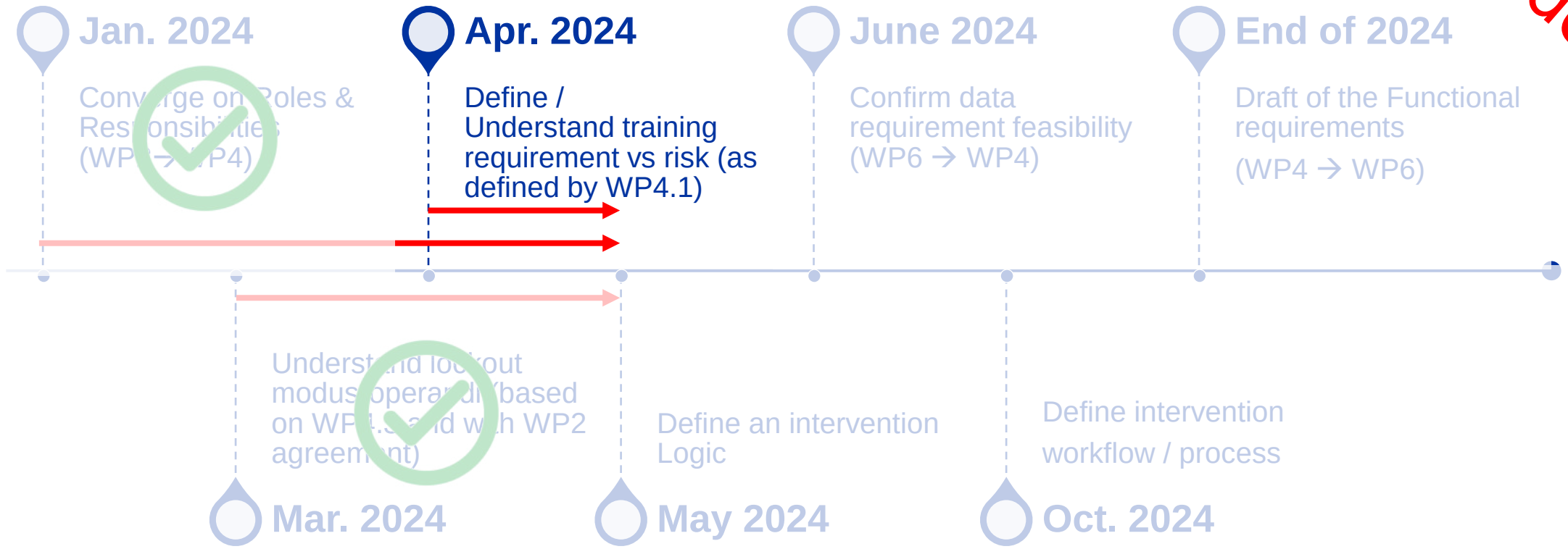

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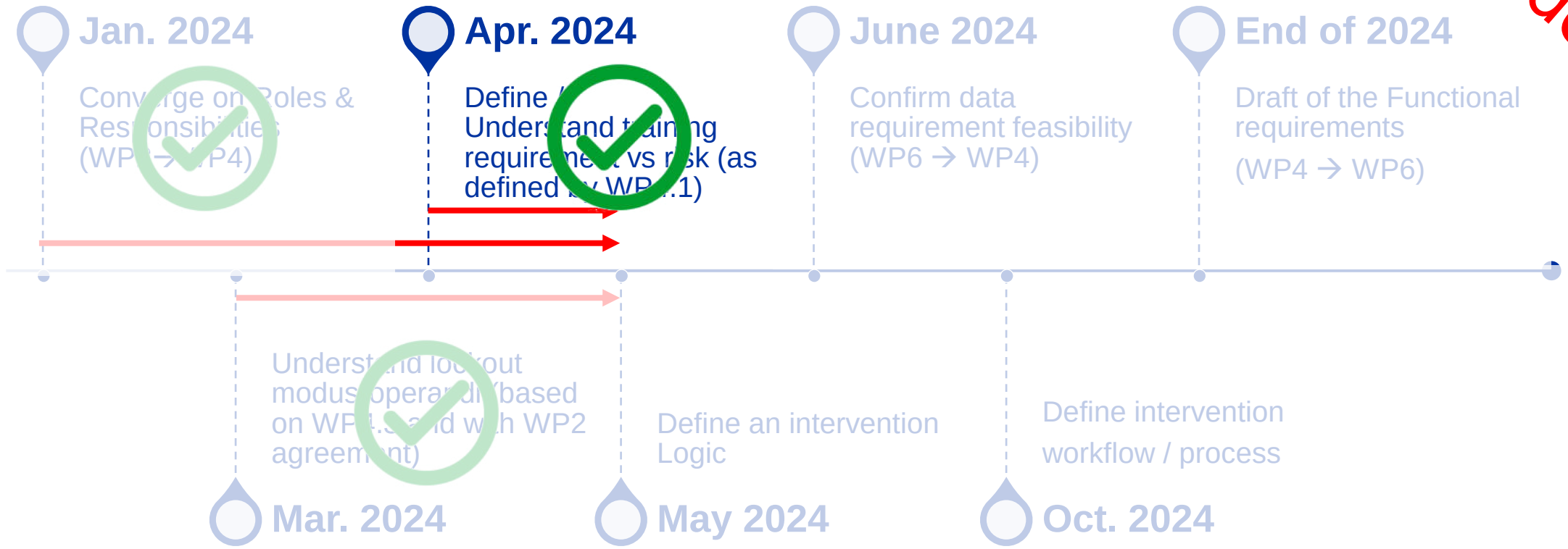

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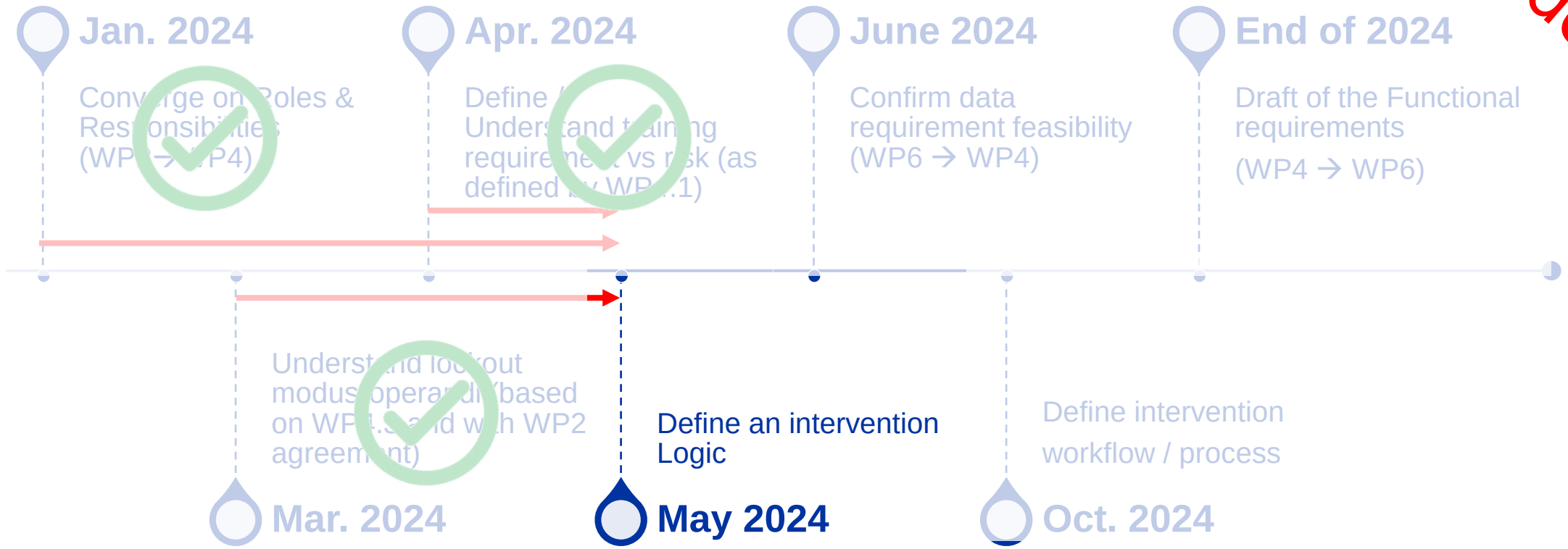

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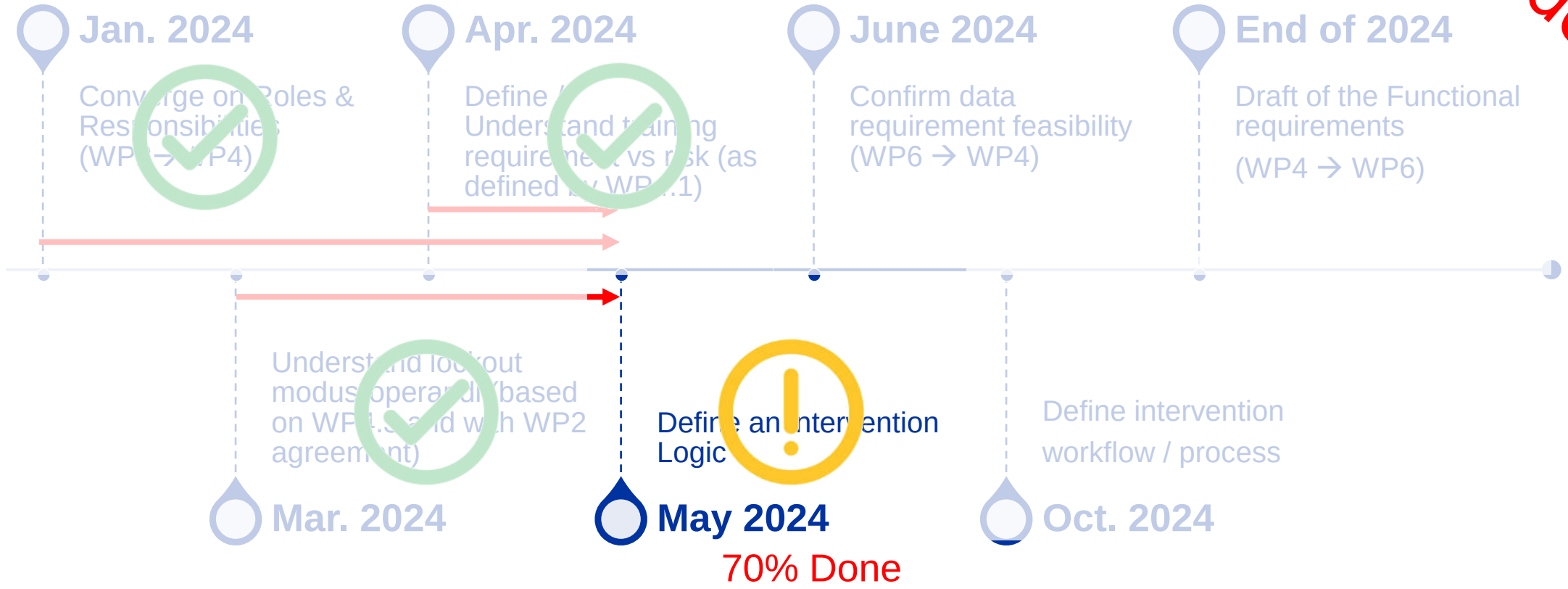

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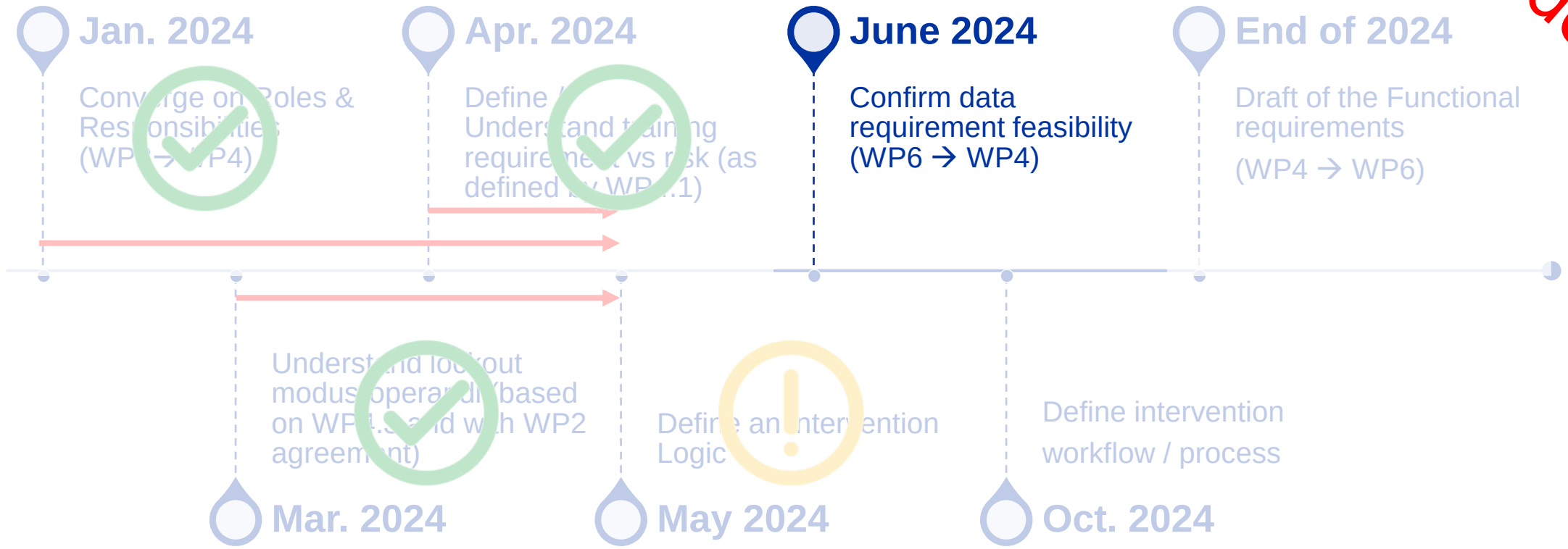

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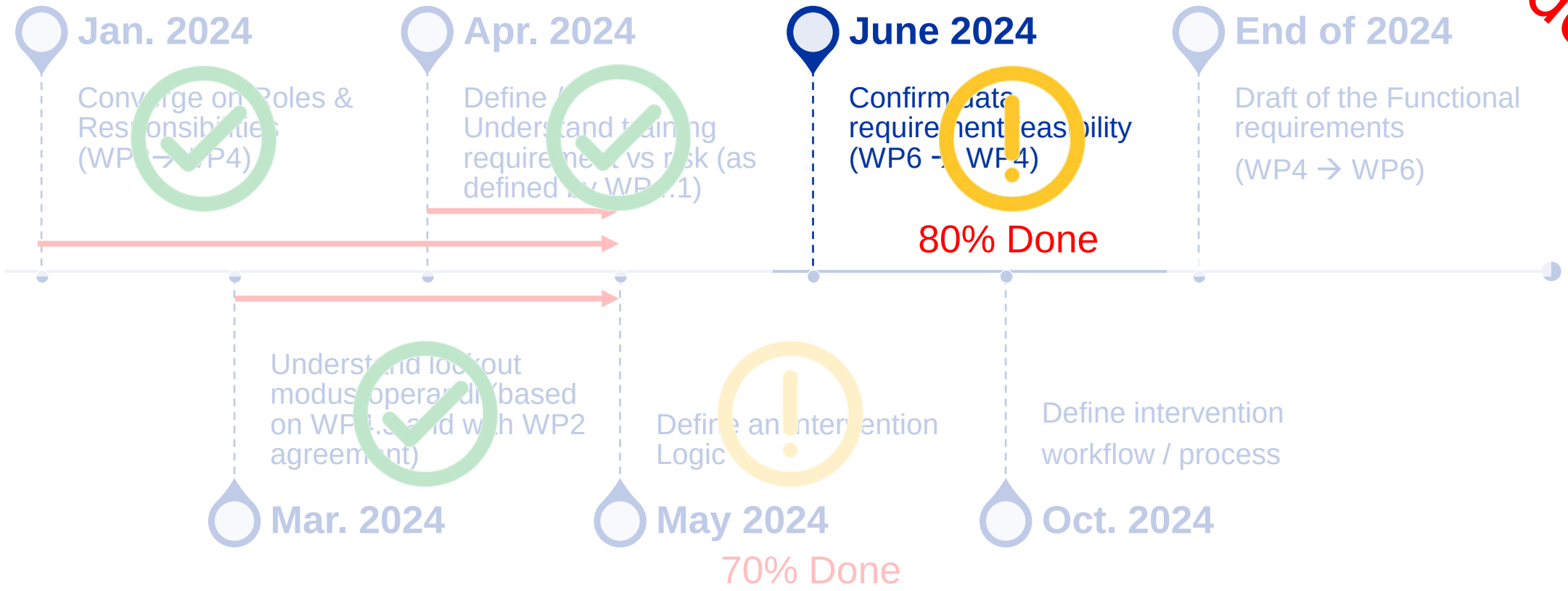

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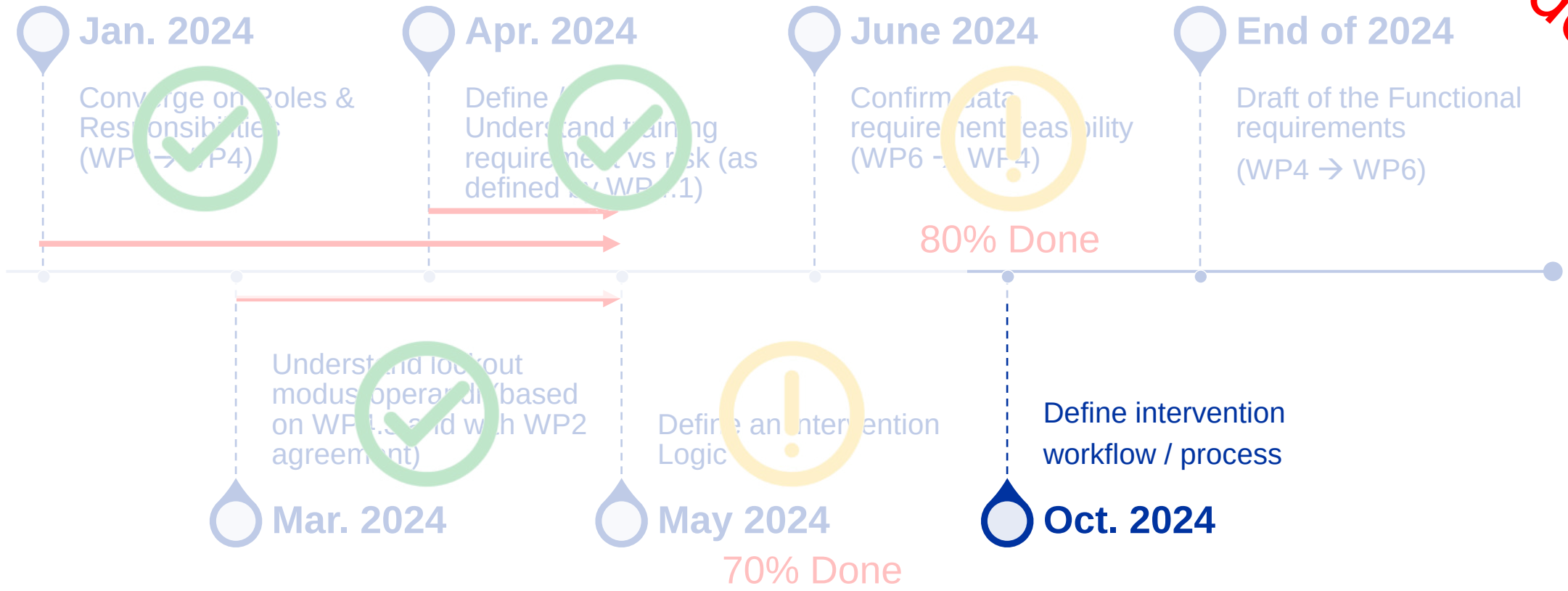

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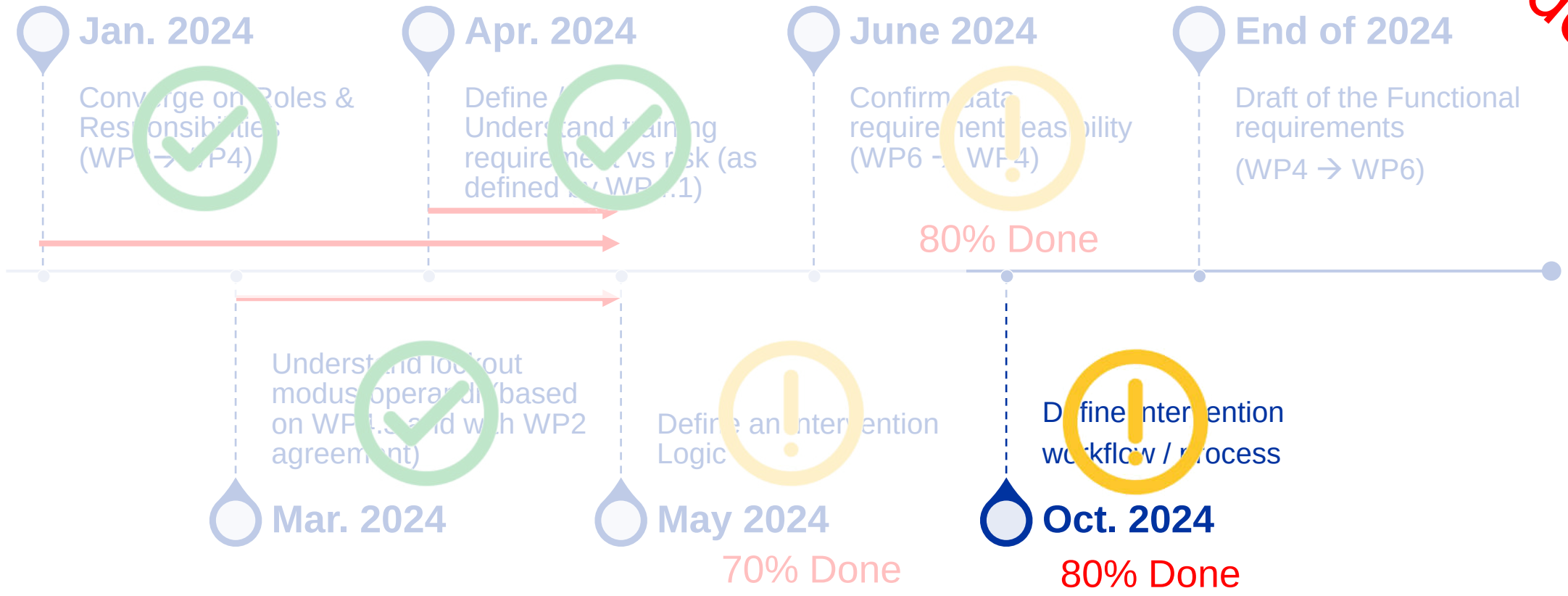

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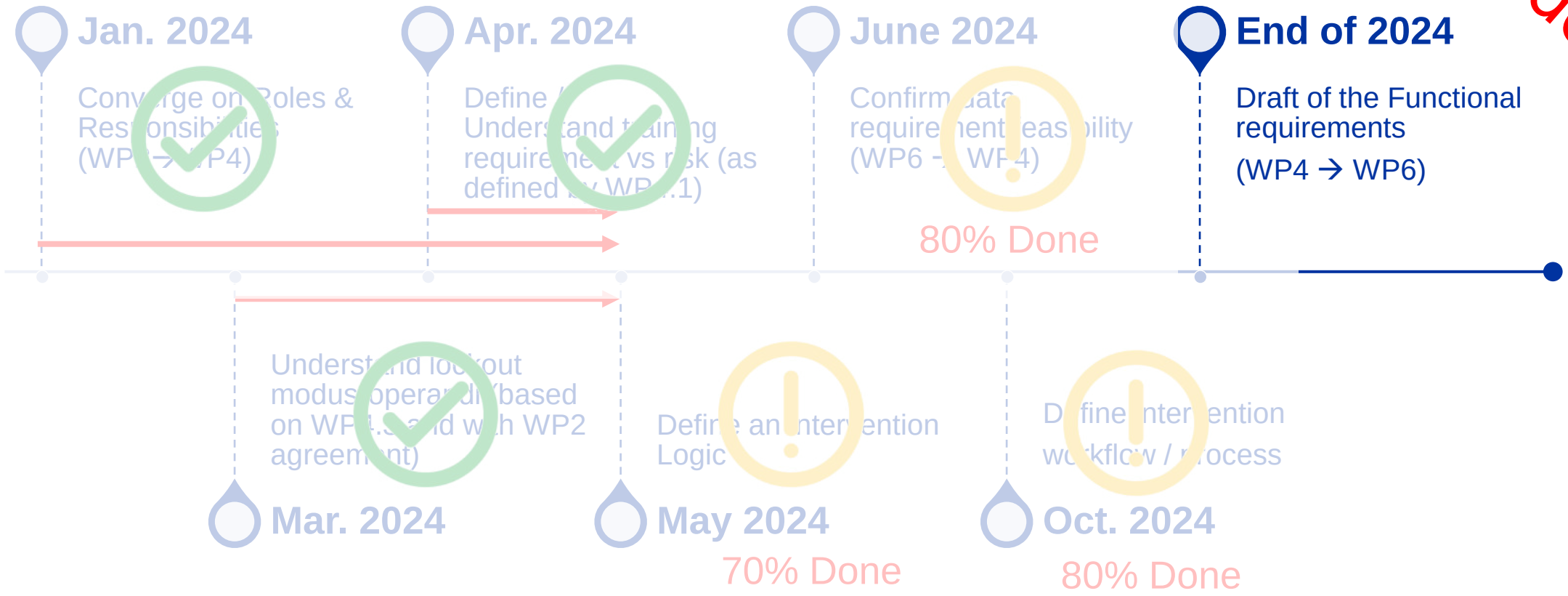

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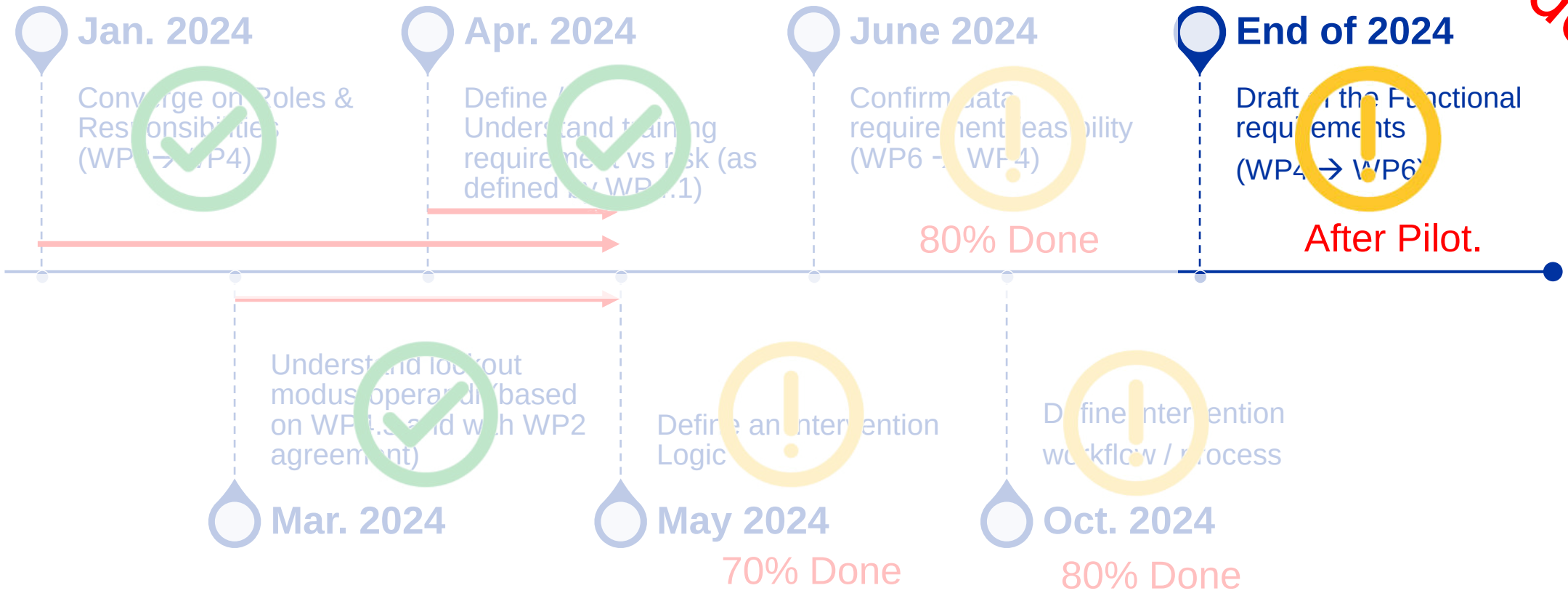


Next Step ?

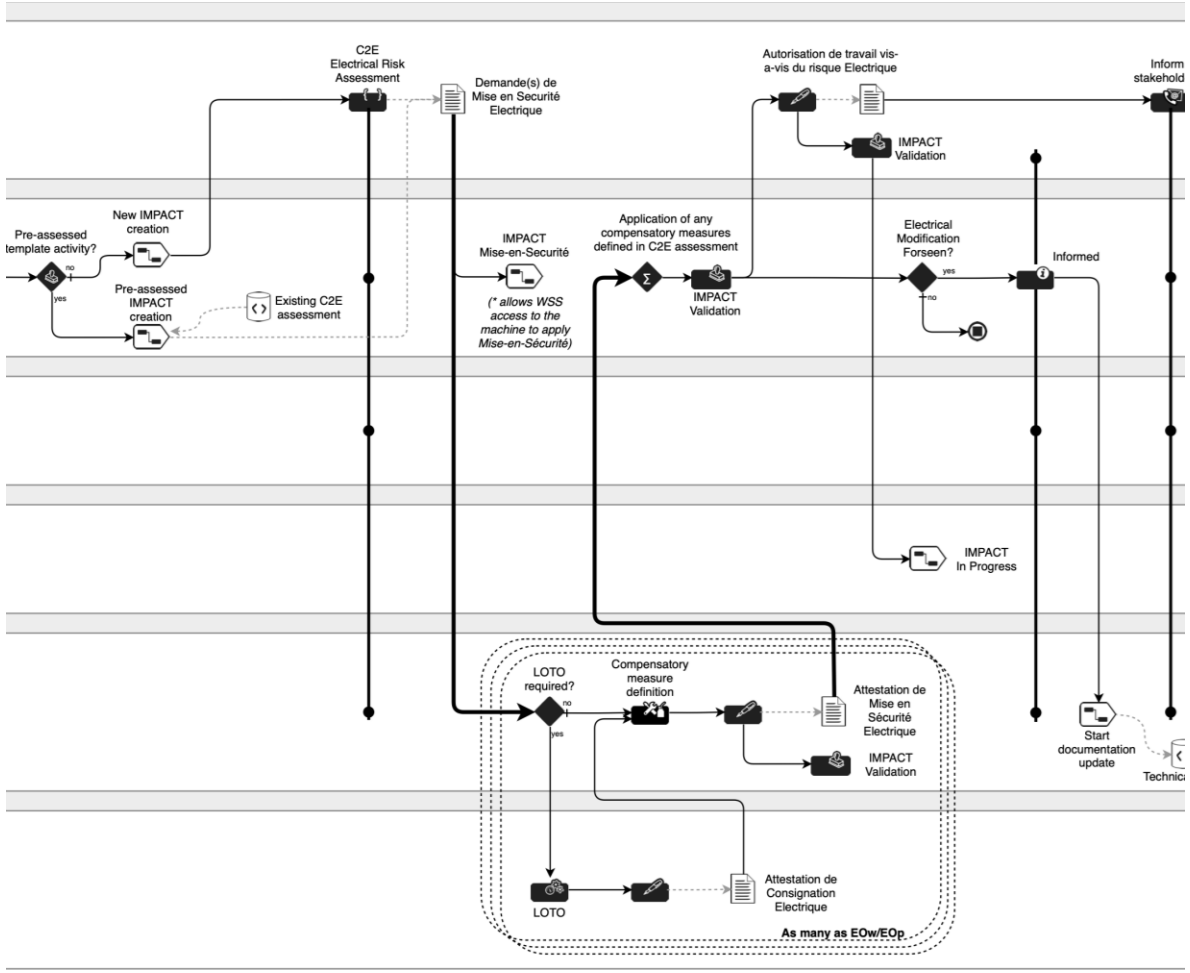
Present to contributors the concept of “pre-assessed” activities to allow “fast access” like piquet.

Finalize the Processes / YACA

Use the defined processes during the Pilot and make sure it applies to both “**planed intervention**” and “**piquet intervention**”.

Update (if needed) the processes and release the “**Guideline for Electrical Risk Management during Interventions**”.

Collaborate closely with **WP6 / IMPACT-NG** to have the ESP portal and IMPACT-NG flow matching the defined processes functional requirements.



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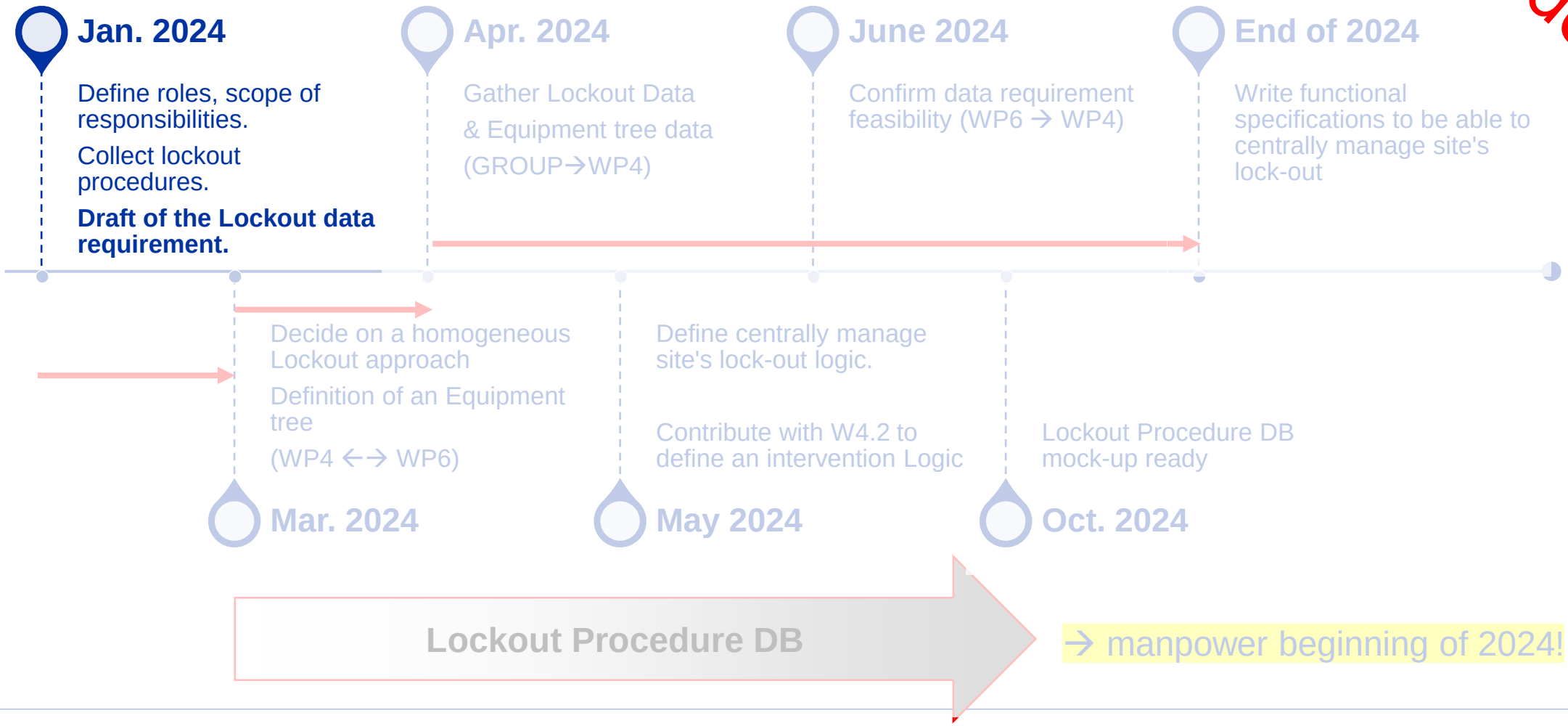

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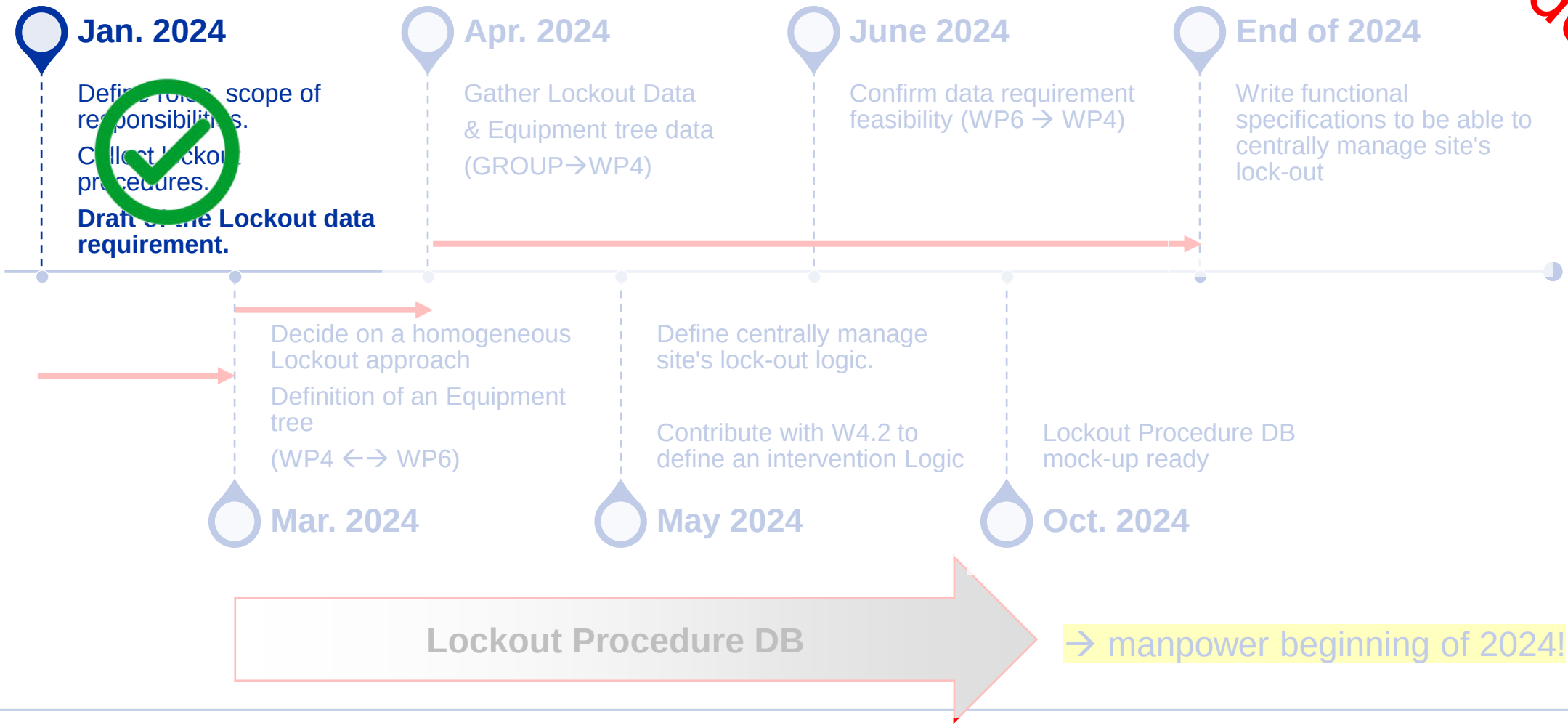

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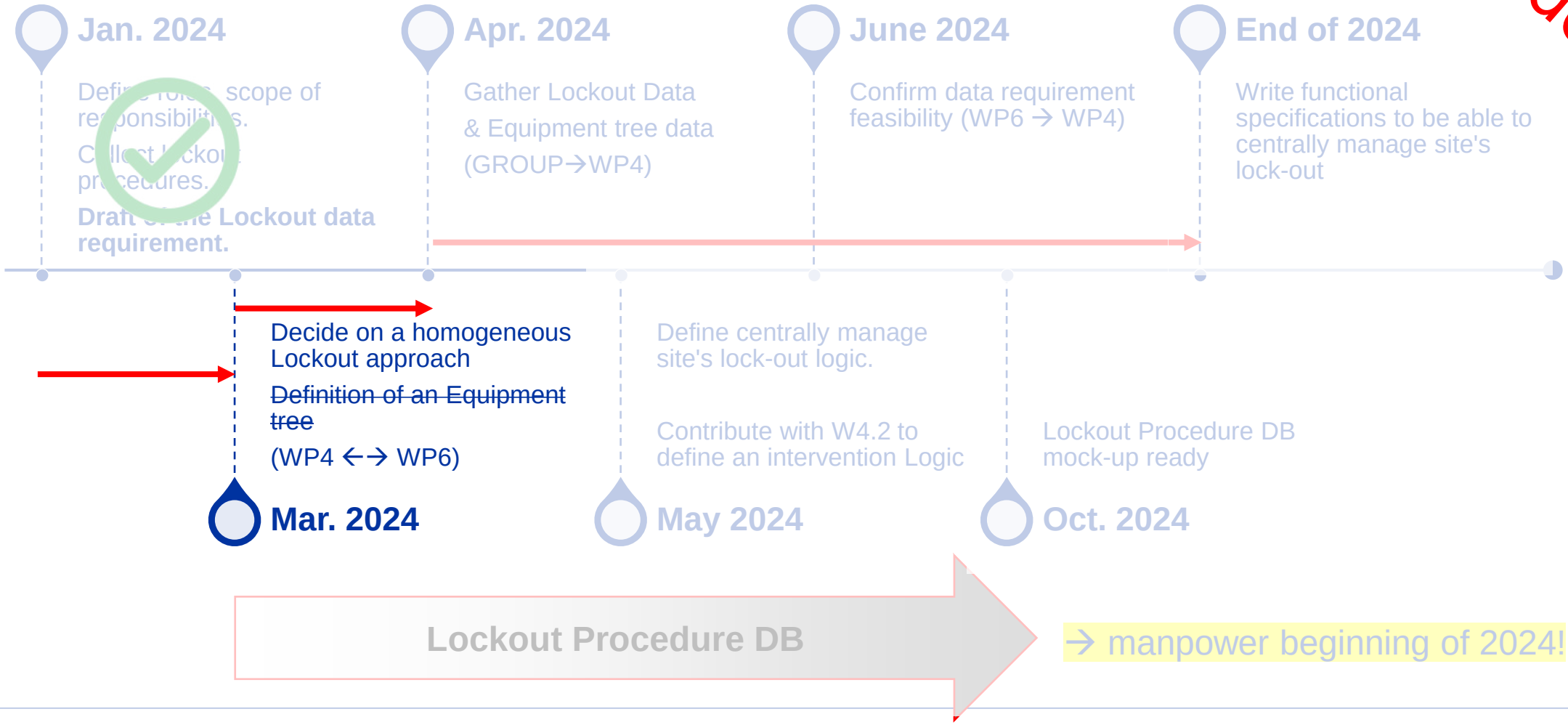

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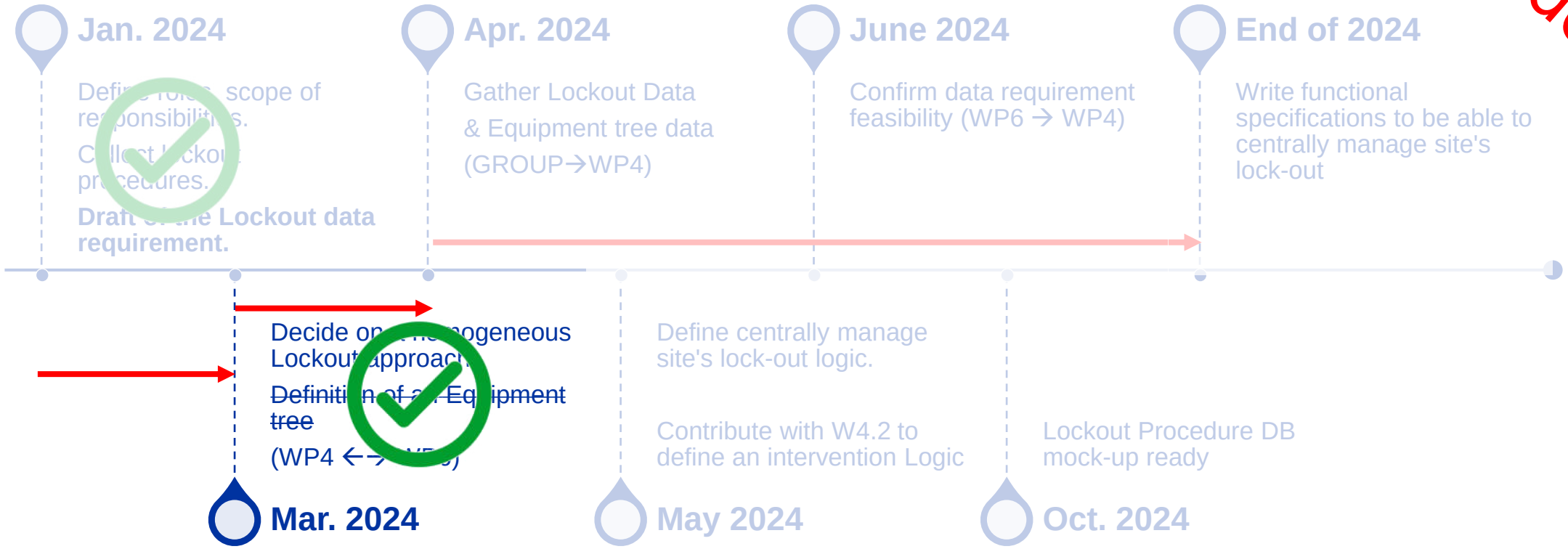

Lockout Procedure DB → manpower beginning of 2024!

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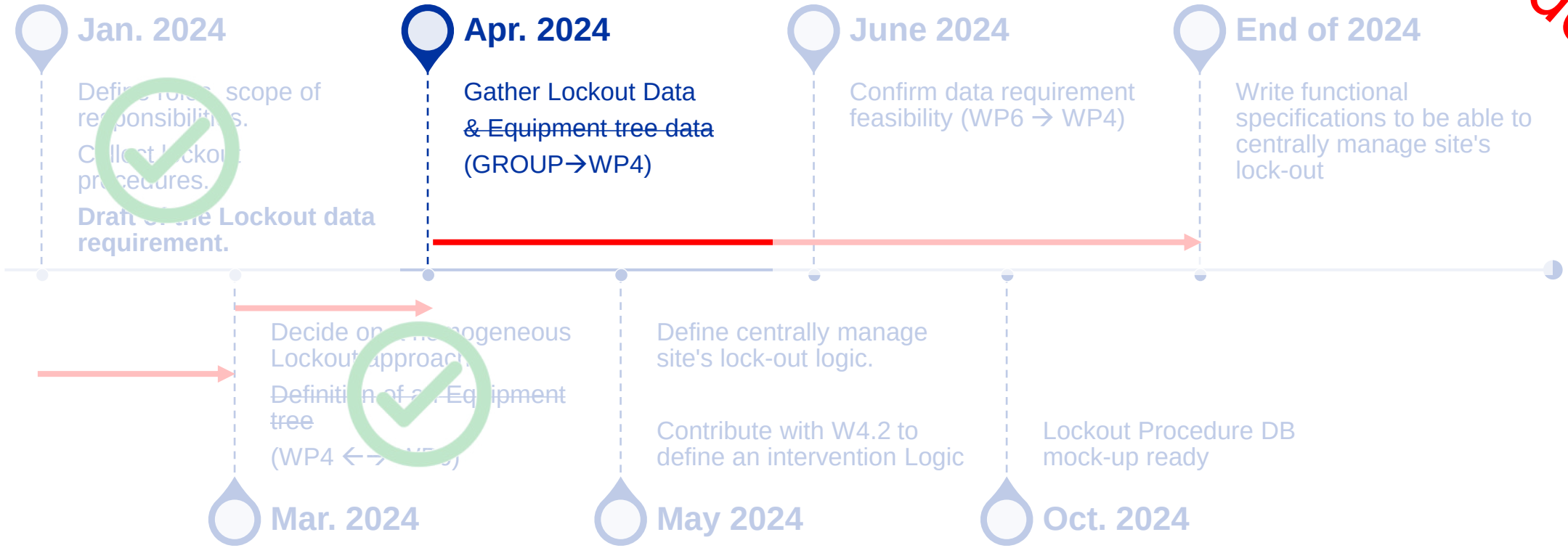

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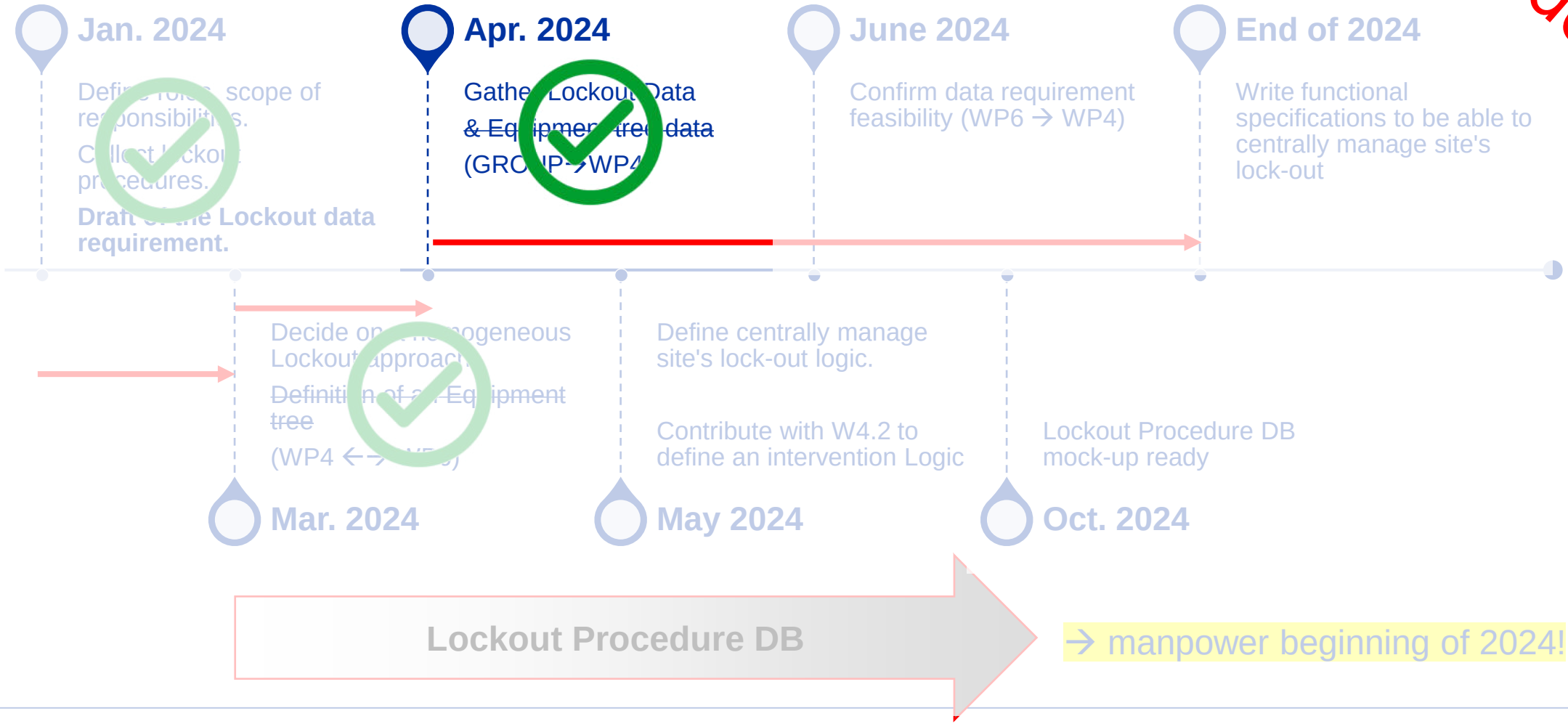

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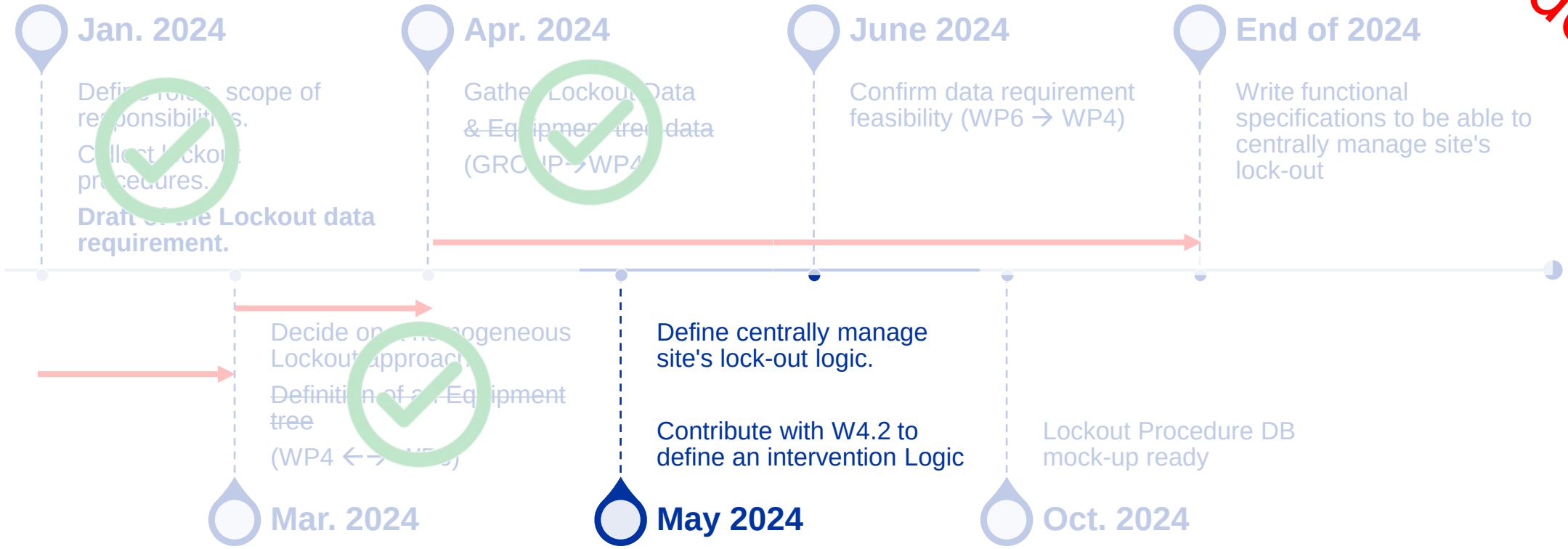

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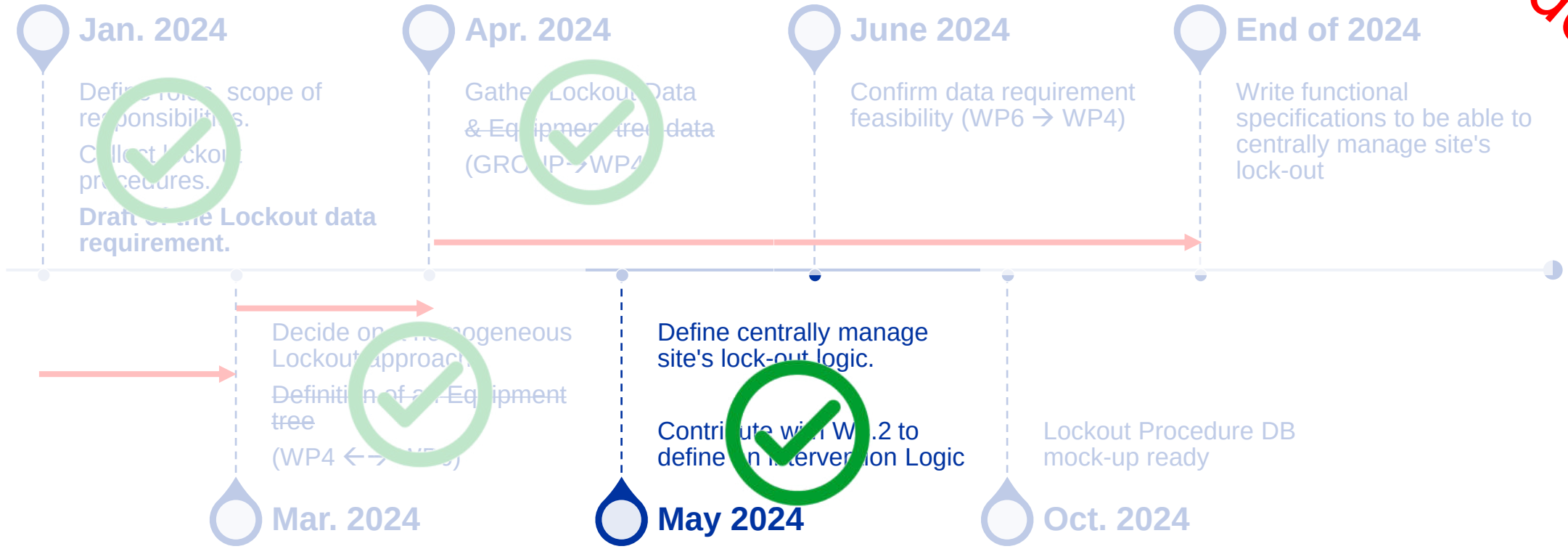

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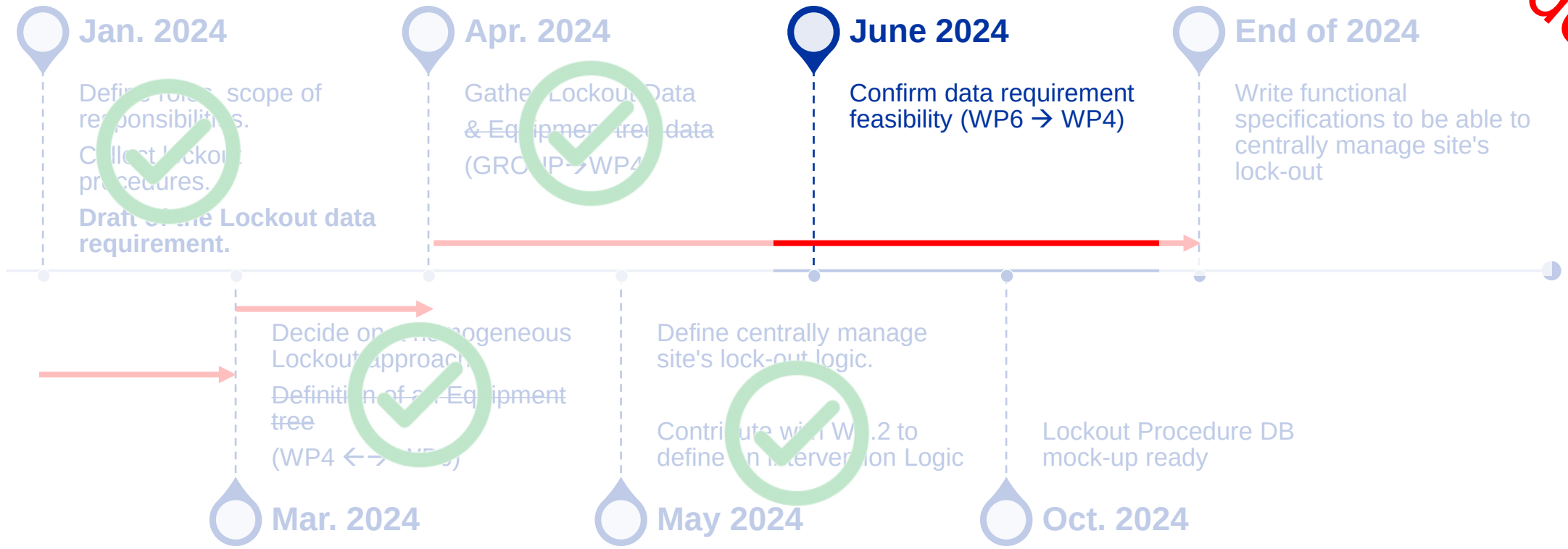

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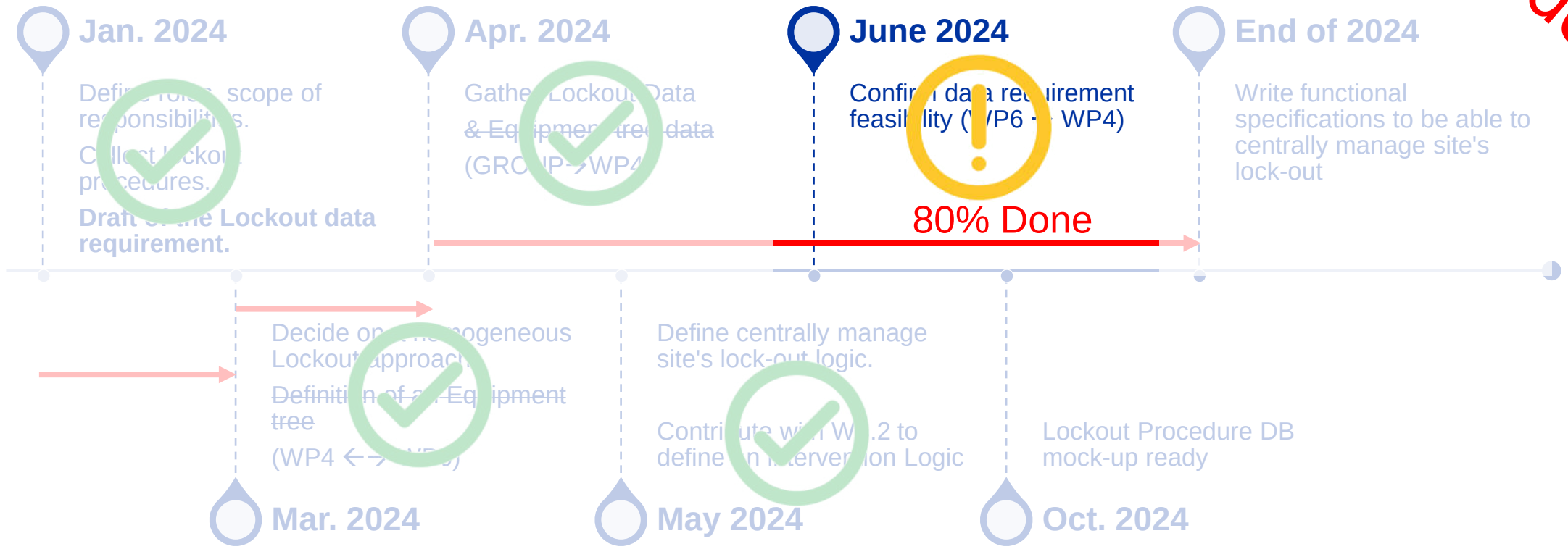

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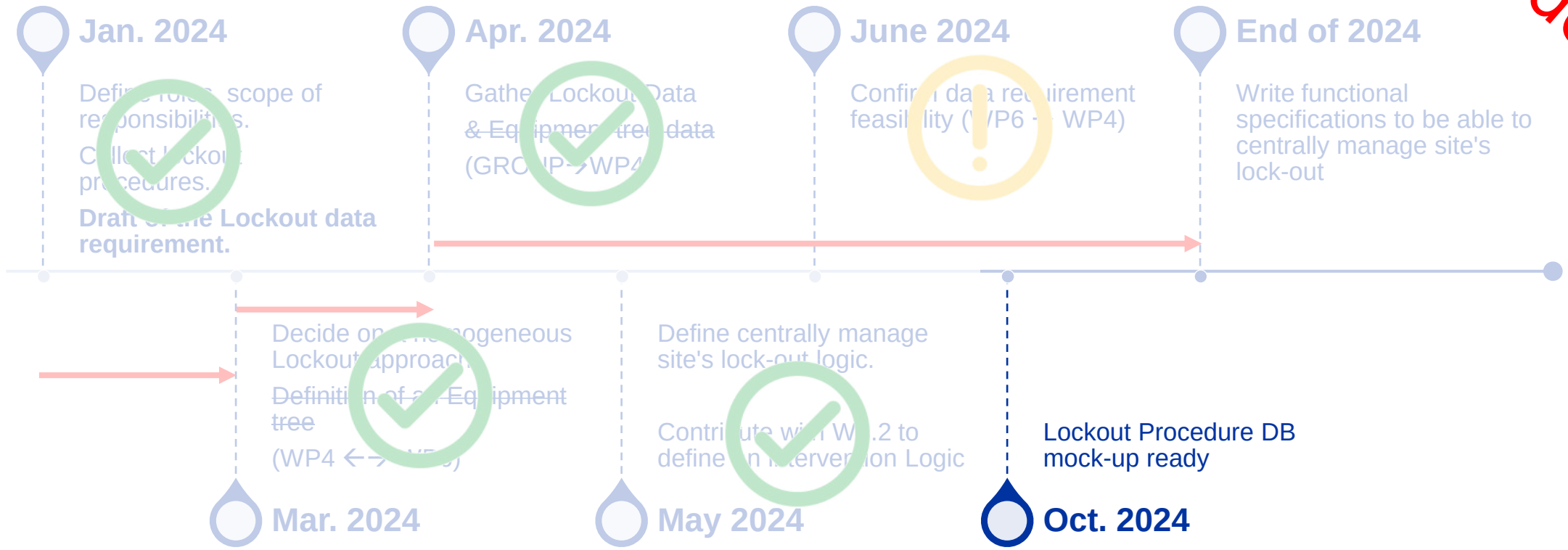

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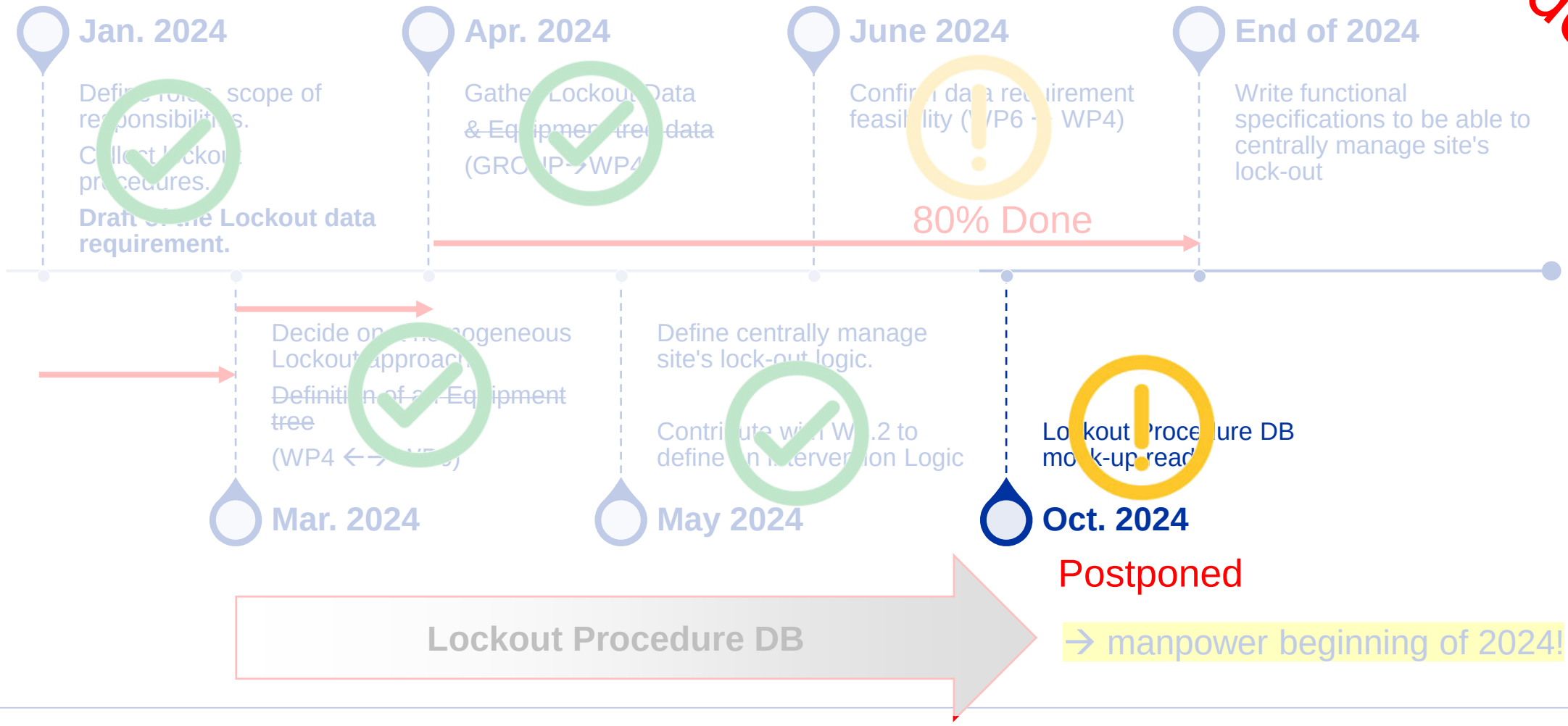

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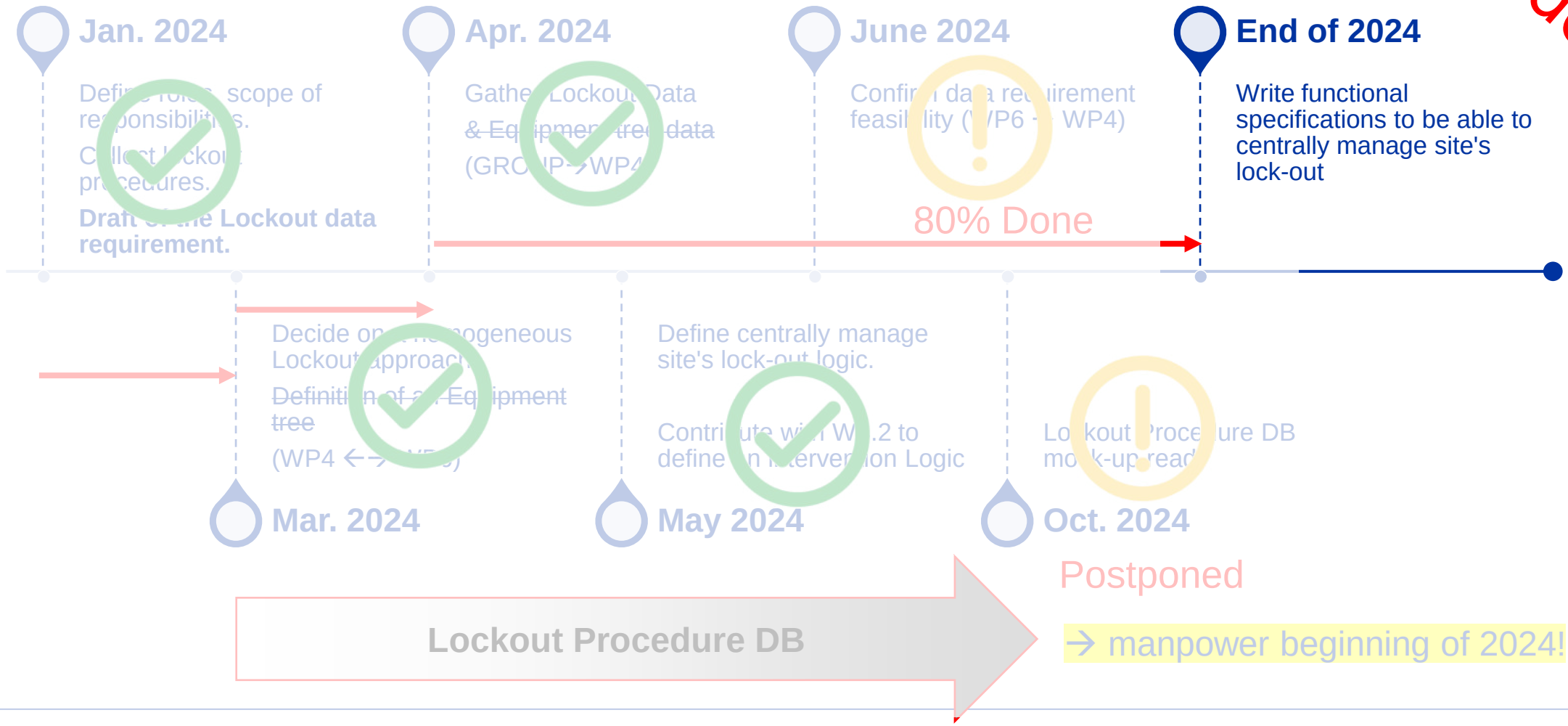

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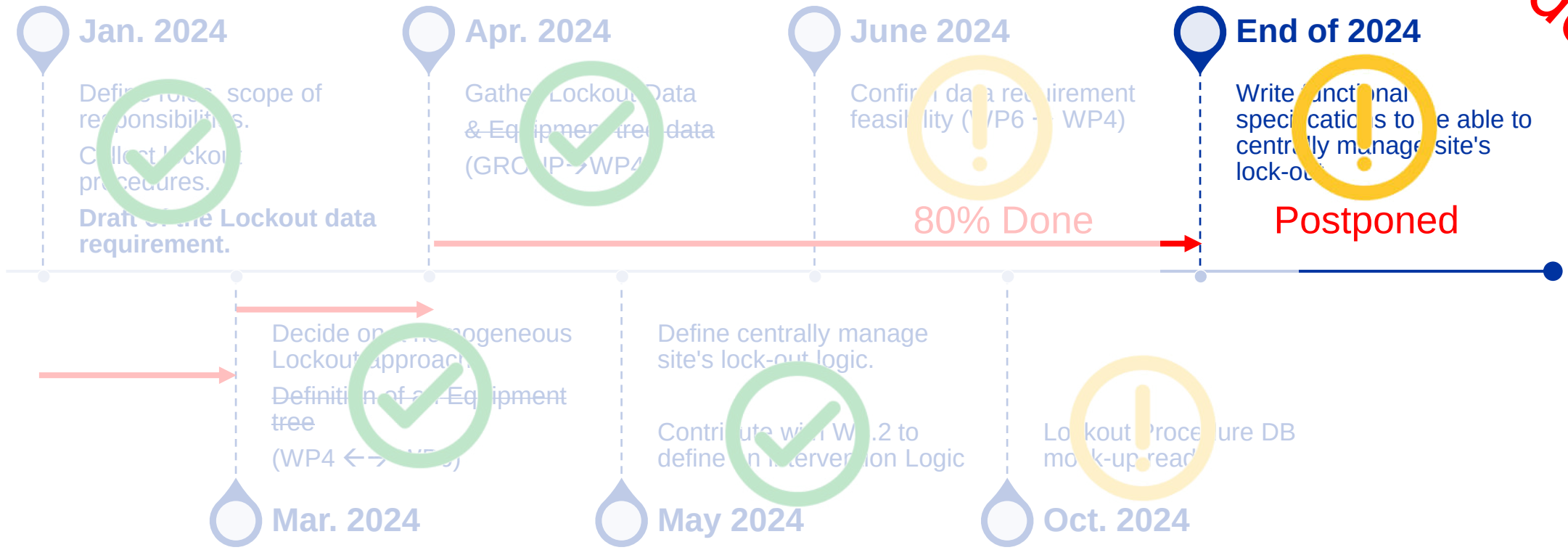


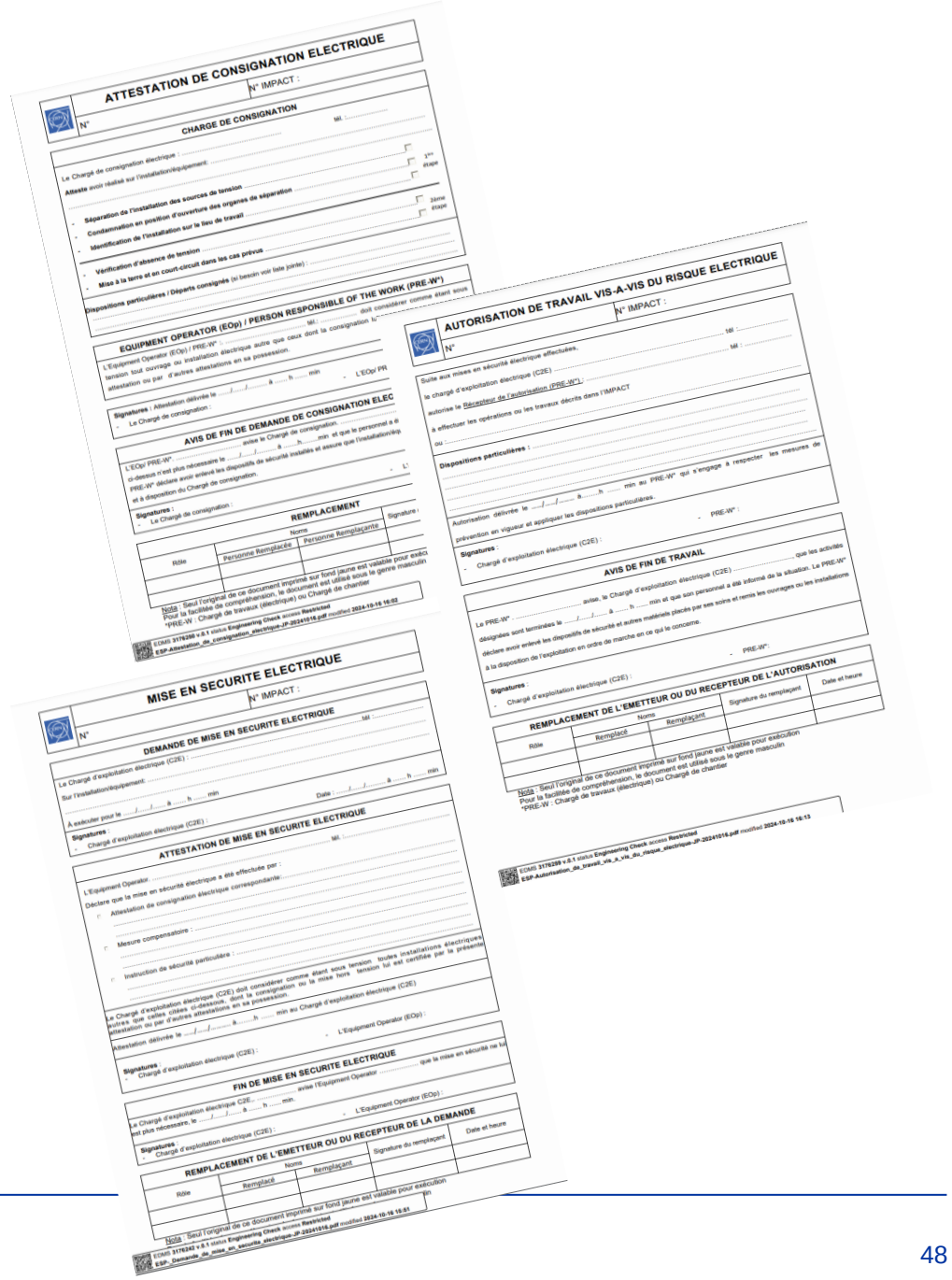
Next Step ?

Get the Contributors approval for the Lockout Forms

Use the Lockout scheme during Pilot and update the forms (if needed)

Get HSE to *legally* check the forms

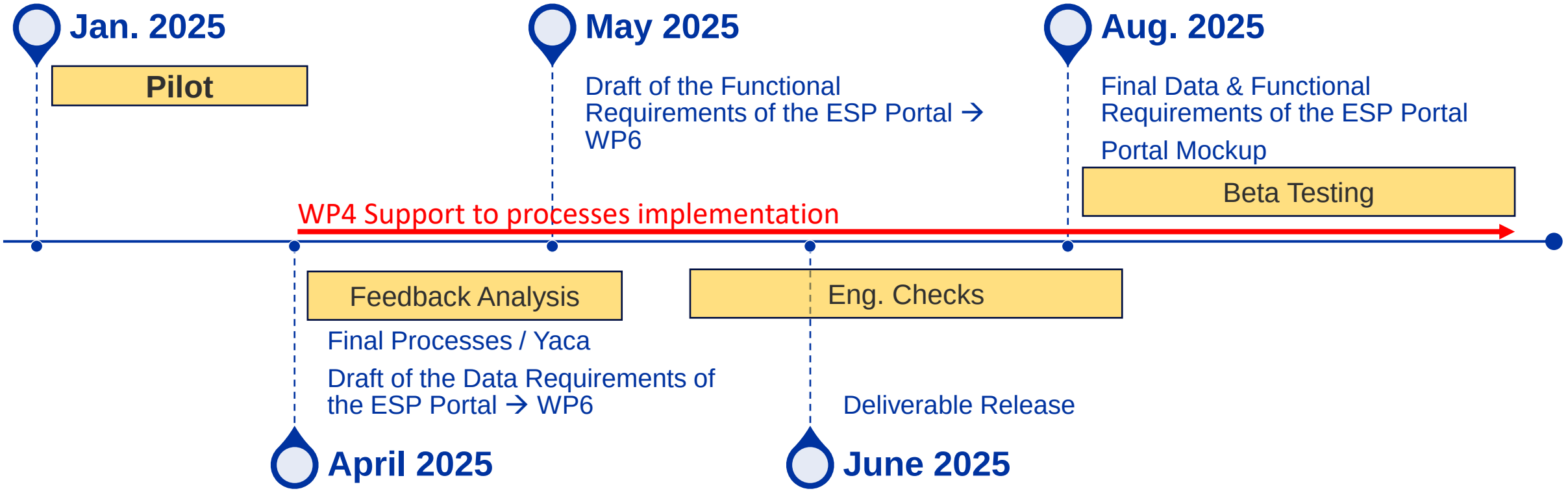
Write the functional requirements for a centralised lockout portal.



Pilot during YETS 24/25

- 3 areas, 7 scenarios (multiple-risks, multiple-responsabilities, multiple-groups)
- Involving ***ordinary*** to ***skilled*** persons.
- How we see it ?
  - Like a Role-playing game (someone asks for an Impact, get a risk assessment, needs a *mise en sécurité, and declares end-of-work)*
- What do we need from the contributors (and from ESP members) ?
  - **Honesty** : "*Players take responsibility for acting out these roles within a narrative, either through literal acting or through a process of structured decision-making regarding character development*." (source Wikipedia)
  - **Neutrality**: *Player* must represent the CERN reality.
  - To help us to make sure that the processes fits the Contributors needs.

2025 Roadmap



Legend: **Contributors**

CONCLUSIONS

- WP4 contribution to others WPs has been very significant for the definitions of the roles and the basic processes.
- WP4.2 is slightly behind schedule compared to last year’s planning, but it should have no impact as we should be ready for the YETS Pilot
- Main concern are:
  - unplanned activities, processes shall allow quick access to facilities whilst applying the same safety criteria
  - Large construction site (i.e: FCC, cryo powering tests during magnet installation…)
  - Keeping Electrical safety information always up to date without blocking operation.
- No manpower needed for WP4 but pressure on WP6 is going to be high.

Thanks for your attention.

WP4 – Scope and Mandate

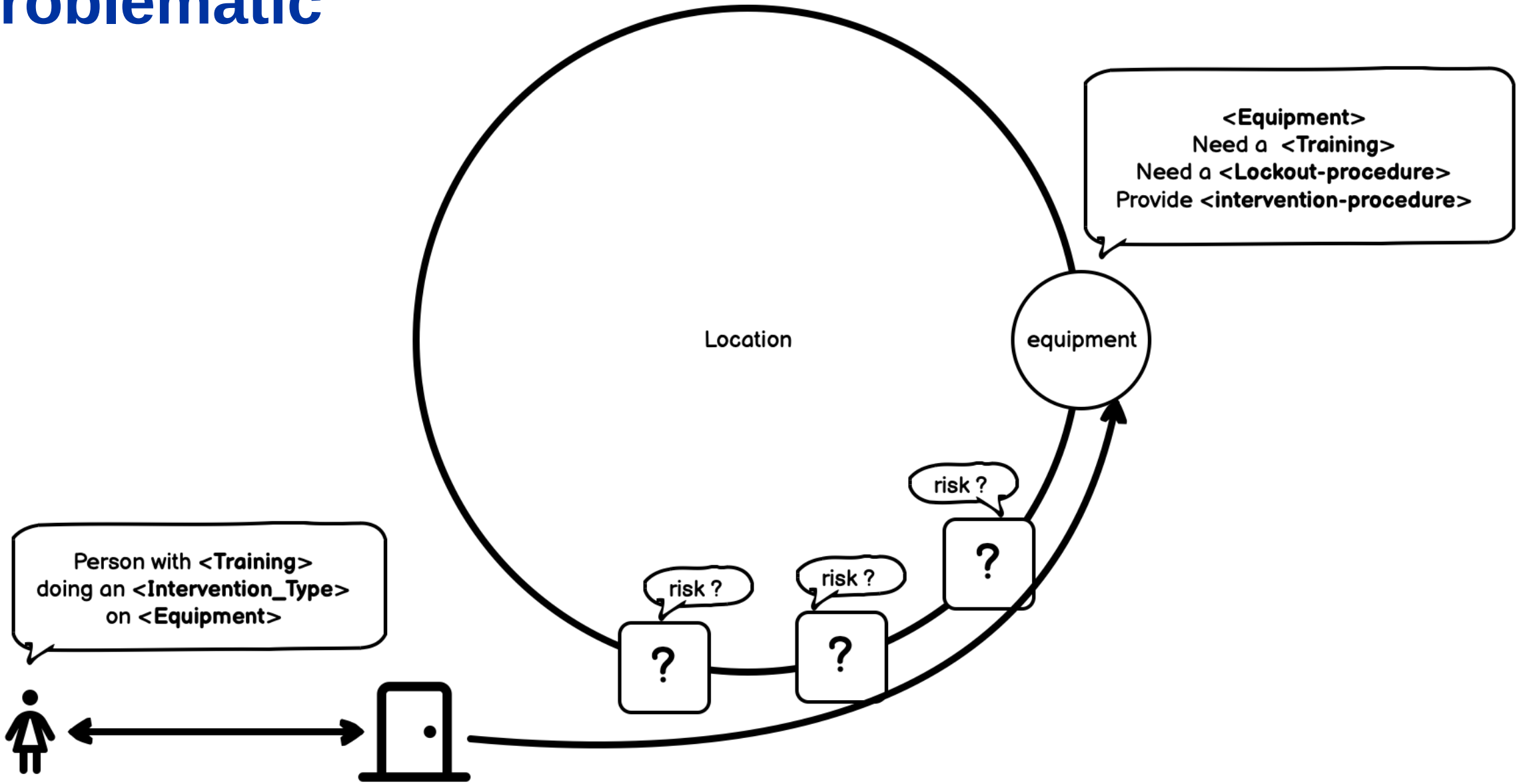
MANDATE:

- Deploy integrated start-to-end methodology / protocols to mitigate risks from electrical hazards during interventions on machines and facilities during all operational phases (i.e., operation, TS, YETS, LS).

SCOPE:

- **Accelerator equipment**:
  - Accelerators complex: injectors, LHC and transfer lines.
  - Experimental areas: EA, NA, ISOLDE/HIE- ISOLDE, CLEAR, NTOF, AD, HiRadMat.
  - ATS projects: HL-LHC, AWAKE, NA-CONS.
  - Machine buildings linked to the accelerators complex.

Problematic



WP4 – Deliverables

D4.1.: Definition and then deployment of processes to allow groups to identify, evaluate and classify the electrical risks and the corresponding safety procedures / measures to mitigate the electrical risk;

D4.2.: Definition and allocation of the roles with respect to electrical safety within the intervention processes; workflow and procedure to deliver work permits should be clearly defined.

D4.3.: Definition of lock-out procedures (sources and worksite) and validation of the existing ones.

D4.4.: Definition of the required conditions to allow access / work in an area where an electrical risk is identified.

D4.5.: Definition of access management process in working area where an electrical risk is identified.

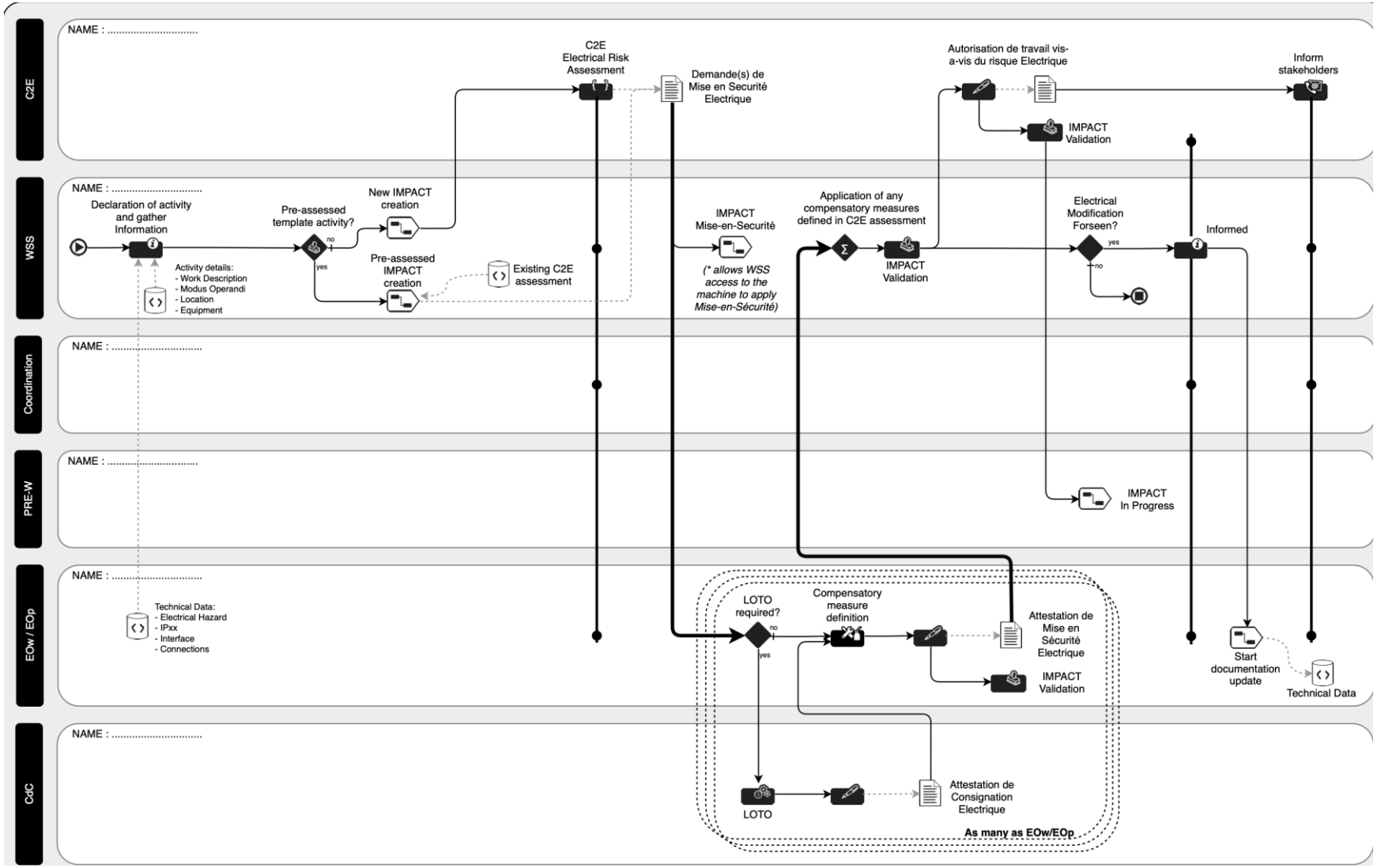
D4.6.: Set-up of the Electrical Safety Expert (ESET) to support the implementation of the electrical safety by the ATS groups in the long term.

D4.7.: Support to processes implementation / update

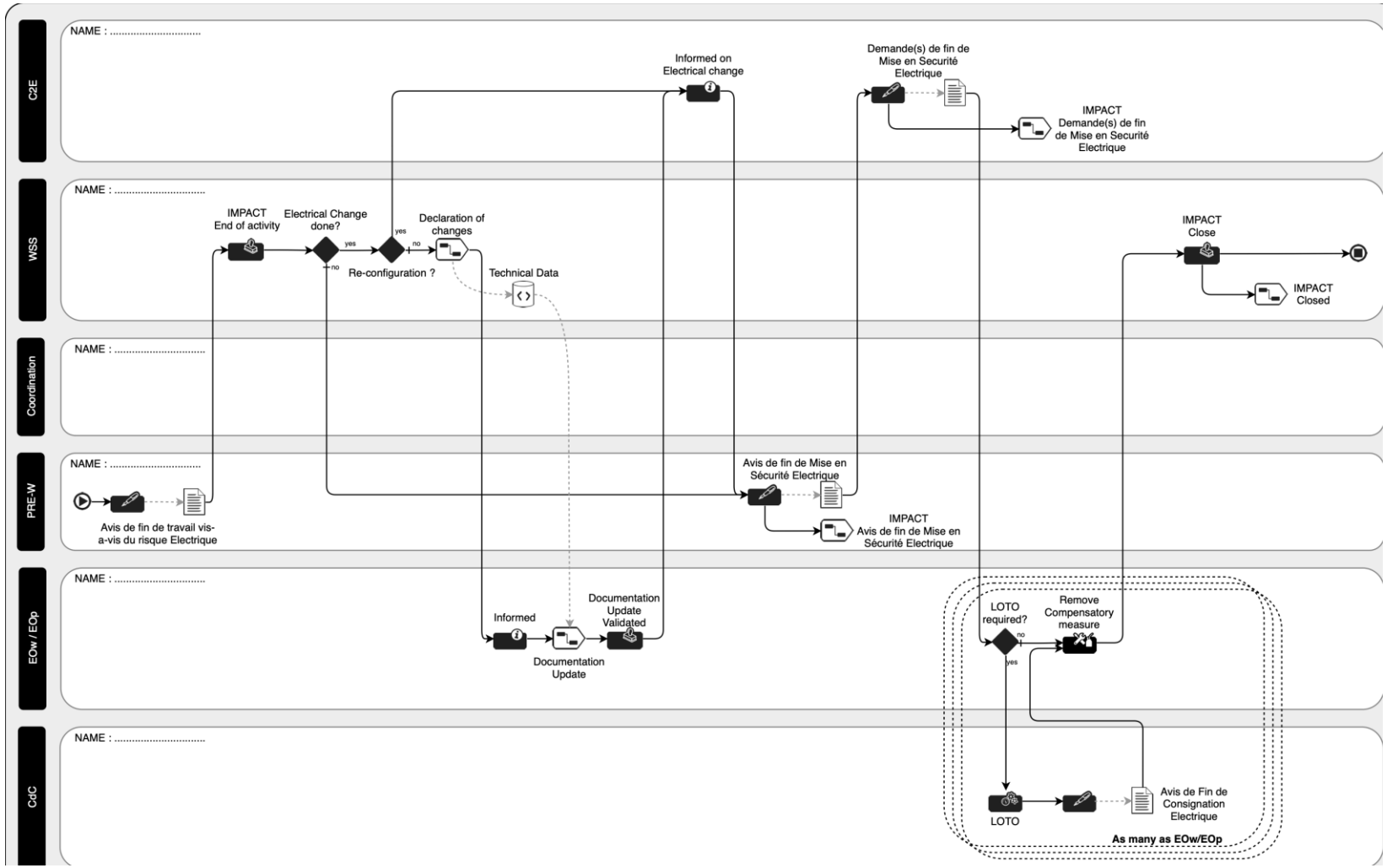
WP4 – Pilot Scenarios

- Scenario 1: Aligning the T10.MQNEL012 magnet.
- Scenario 2: Alignment of the T10 beam line.
- Scenario 3: Replacement of seals on the cooling feeder. **(East Area)**
- Scenario 4: Cleaning of room 157/R-F09.
- Scenario 5: Night intervention: A converter fault.
- Scenario 6: QLC1H-S-M01 Compressor - temporary removal for maintenance by TE/CRG at **SH18**
- Scenario 7: Troubleshooting intervention by TE/CRG (checking the connections on a power supply valve), on a DFB at **LHC** point 1 - on call from the control room, during the physics period.

WP4 – YACA


C2E
WSS
Coordination
PRE-W
EOw / EOp
CdC
NAME : .....
C2E Electrical Risk Assessment
Demande(s) de Mise en Securité Electrique
Autorisation de travail vis-a-vis du risque Electrique
Inform stakeholders
IMPACT Validation
Declaration of activity and gather Information
Pre-assessed template activity?
New IMPACT creation
Pre-assessed IMPACT creation
Existing C2E assessment
Activity details:
- Work Description
- Modus Operandi
- Location
- Equipment
IMPACT Mise-en-Securité
(* allows WSS access to the machine to apply Mise-en-Sécurité)
Application of any compensatory measures defined in C2E assessment
IMPACT Validation
Electrical Modification Forseen?
Informed
IMPACT In Progress
Technical Data:
- Electrical Hazard
- IPxx
- Interface
- Connections
LOTO required?
Compensatory measure definition
Attestation de Mise en Sécurité Electrique
IMPACT Validation
Start documentation update
Technical Data
LOTO
Attestation de Consignation Electrique
As many as EOw/EOp

WP4 – YACA


C2E
WSS
Coordination
PRE-W
EOw / EOp
CdC
NAME : .....
Informed on Electrical change
Demande(s) de fin de Mise en Securité Electrique
IMPACT Demande(s) de fin de Mise en Securité Electrique
IMPACT End of activity
Electrical Change done?
yes
no
Declaration of changes
Re-configuration ?
Technical Data
IMPACT Close
IMPACT Closed
Avis de fin de travail vis-a-vis du risque Electrique
Avis de fin de Mise en Sécurité Electrique
IMPACT Avis de fin de Mise en Sécurité Electrique
Informed
Documentation Update Validated
Documentation Update
LOTO required?
Remove Compensatory measure
LOTO
Avis de Fin de Consignation Electrique
As many as EOw/EOp