InCA

Injector Control Architecture

Stephane Deghaye (AB/CO)

ATC/ABOC days

22-01-2008

Agenda

- PS Complex Control Software Renovation WG
- Requirements - What Services?
- Solution Evaluation – LSA, PS system.
- Injector Control Architecture
  - Component View
  - 3-tier Architecture
  - Deployment View
- Dependencies with AB groups
- Project Planning
- Risks & Solutions
- Conclusions

Agenda

- PS Complex Control Software Renovation WG
- Requirements - What Services?
- Solution Evaluation – LSA, PS system.
- Injector Control Architecture
  - Component View
  - 3-tier Architecture
  - Deployment View
- Dependencies with AB groups
- Project Planning
- Risks & Solutions
- Conclusions

Working Group Objectives

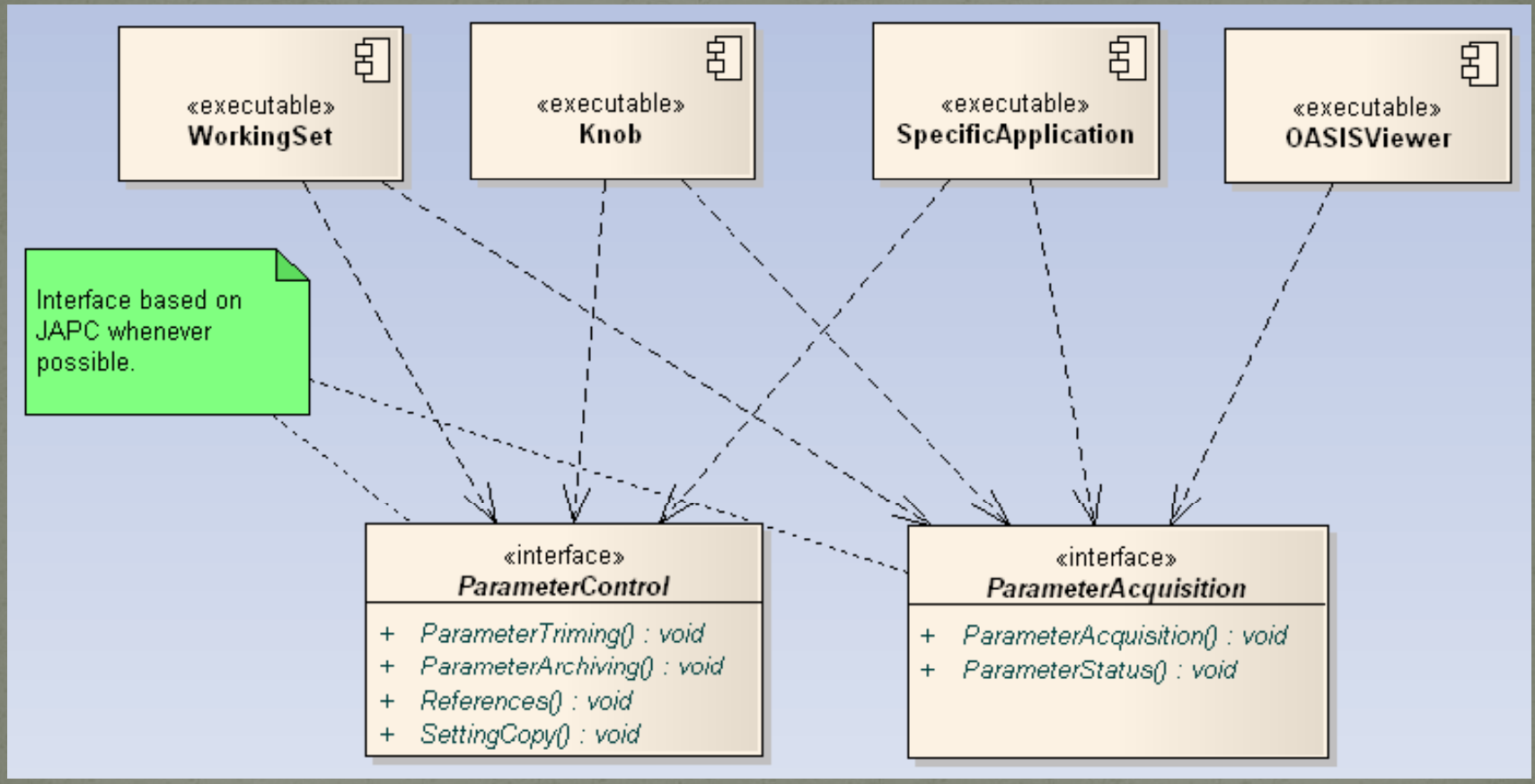
From *Strategy for PS complex control software renovation Working Group Mandate*, M. Benedikt, E. Hatziangeli, R. Steerenberg.

1. Summarise the PS complex requirements for Core control software.
2. Evaluate the application of the present LHC Software Architecture (LSA).
3. Draft a proposal for an adaptation of LSA to comply with the requirements.
4. Develop an alternative proposal based on the existing PS control philosophy.
5. Compare both solutions.

Agenda

- PS Complex Control Software Renovation WG
- Requirements - What Services?
- Solution Evaluation – LSA, PS system.
- Injector Control Architecture
  - Component View
  - 3-tier Architecture
  - Deployment View
- Dependencies with AB groups
- Project Planning
- Risks & Solutions
- Conclusions

What Services?



Agenda

- PS Complex Control Software Renovation WG
- Requirements - What Services?
- Solution Evaluation – LSA, PS system.
- Injector Control Architecture
  - Component View
  - 3-tier Architecture
  - Deployment View
- Dependencies with AB groups
- Project Planning
- Risks & Solutions
- Conclusions

Solution Evaluation - LSA

- Presentation of LSA
  - Current features of LSA core
  - Standard applications (Trim editor, EquipState…)
- ☺ Good basis for parameter control
- 😐 Needs modifications (top-down & bottom-up)
- ☹ GUI philosophy not suitable
  (choose action → select GUI → select device)
- ☹ Lack of acquisition & statuses

Solution Evaluation - PS

- Presentation of Java/XMotif PS system
  - Generic applications
  - Configuration tools
- ☺ GUIs fit user requirements (acquisitions…)
- 😐 Some parts have become obscure
- ☹ Performance & Scalability problems
- ☹ Low-level services only and difficult to extend

Solution Evaluation - Conclusions

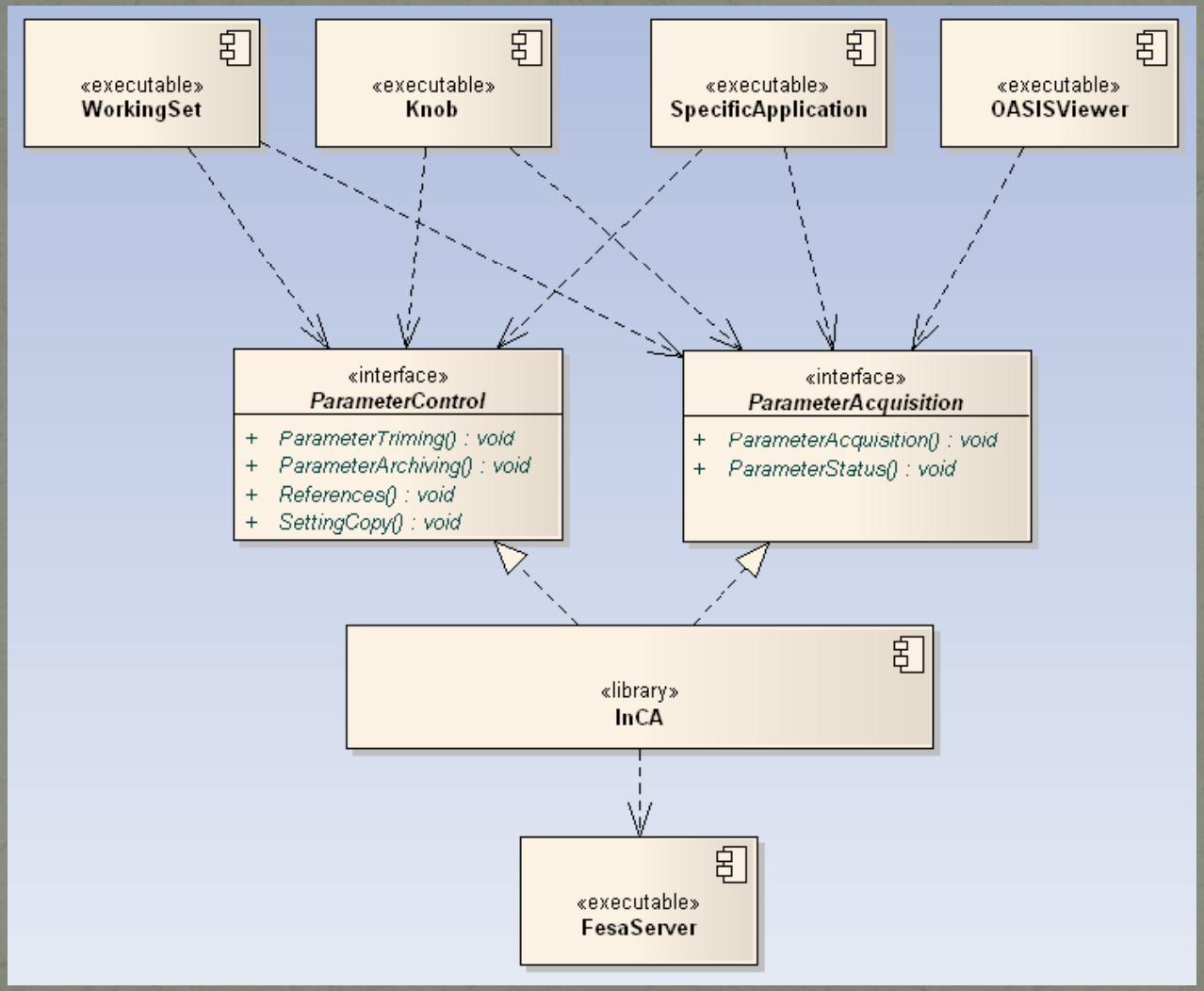
- ✓ LSA: good basis but modifications needed.
- ✗ LSA: Big area of requirements not covered.
- ✓ PSA: Look & feel fit the needs.
- ✗ PSA: performance & scalability problems
- ✗ PSA: obscure & obsolete parts

↳ Injector Control Architecture

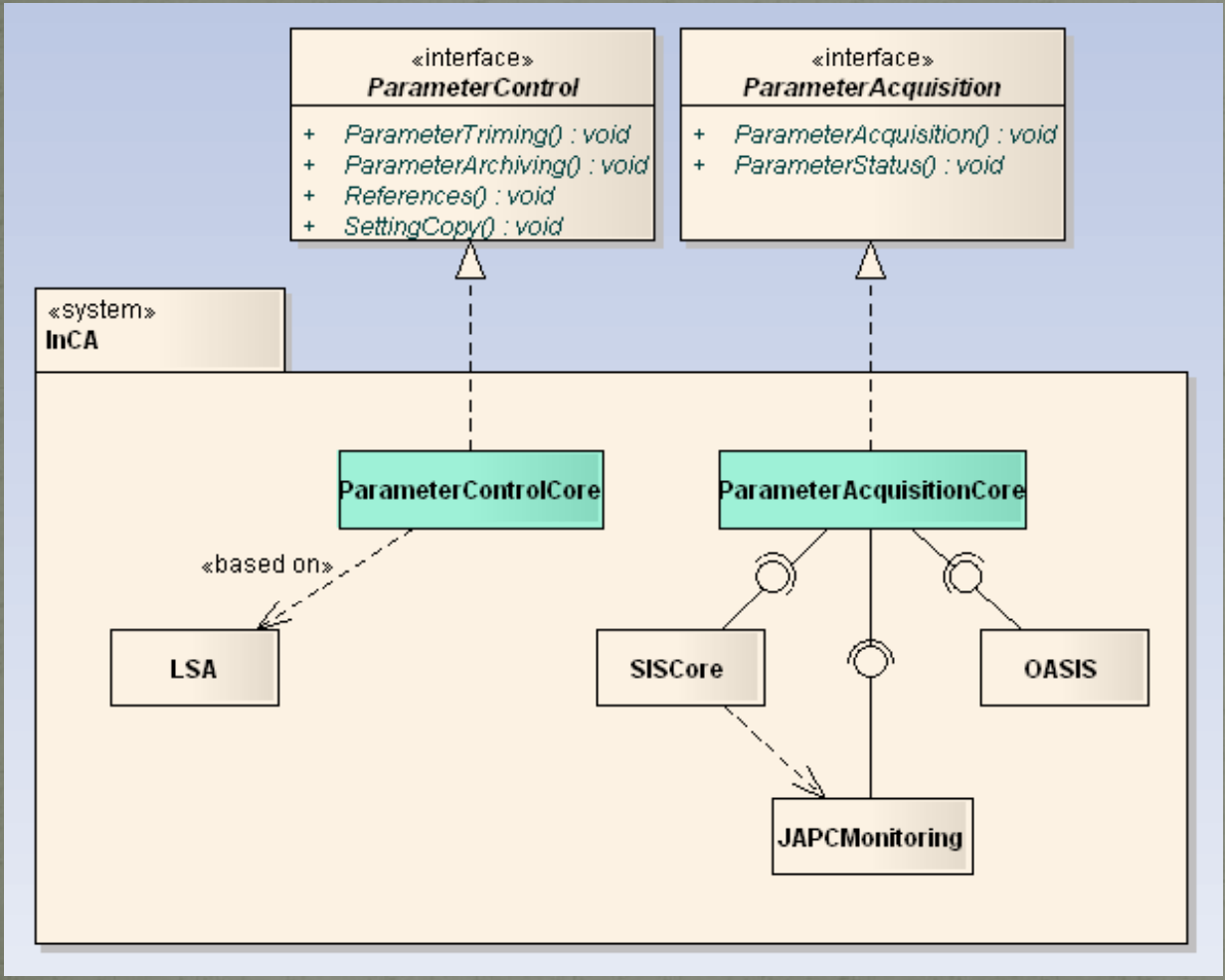
Agenda

- PS Complex Control Software Renovation WG
- Requirements - What Services?
- Solution Evaluation – LSA, PS system.
- Injector Control Architecture
  - Component View
  - 3-tier Architecture
  - Deployment View
- Dependencies with AB groups
- Project Planning
- Risks & Solutions
- Conclusions

Injector Control Architecture

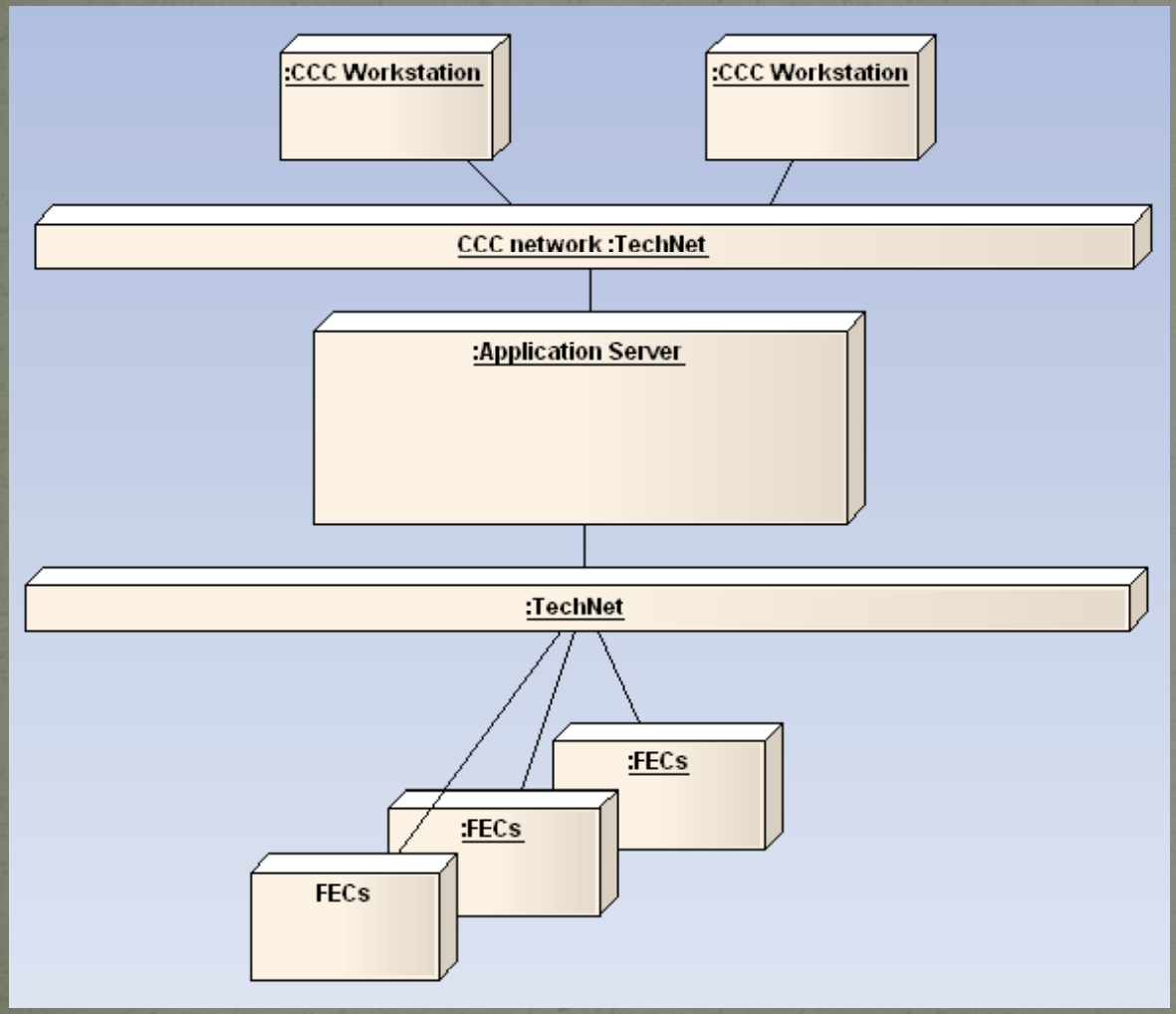


Component View



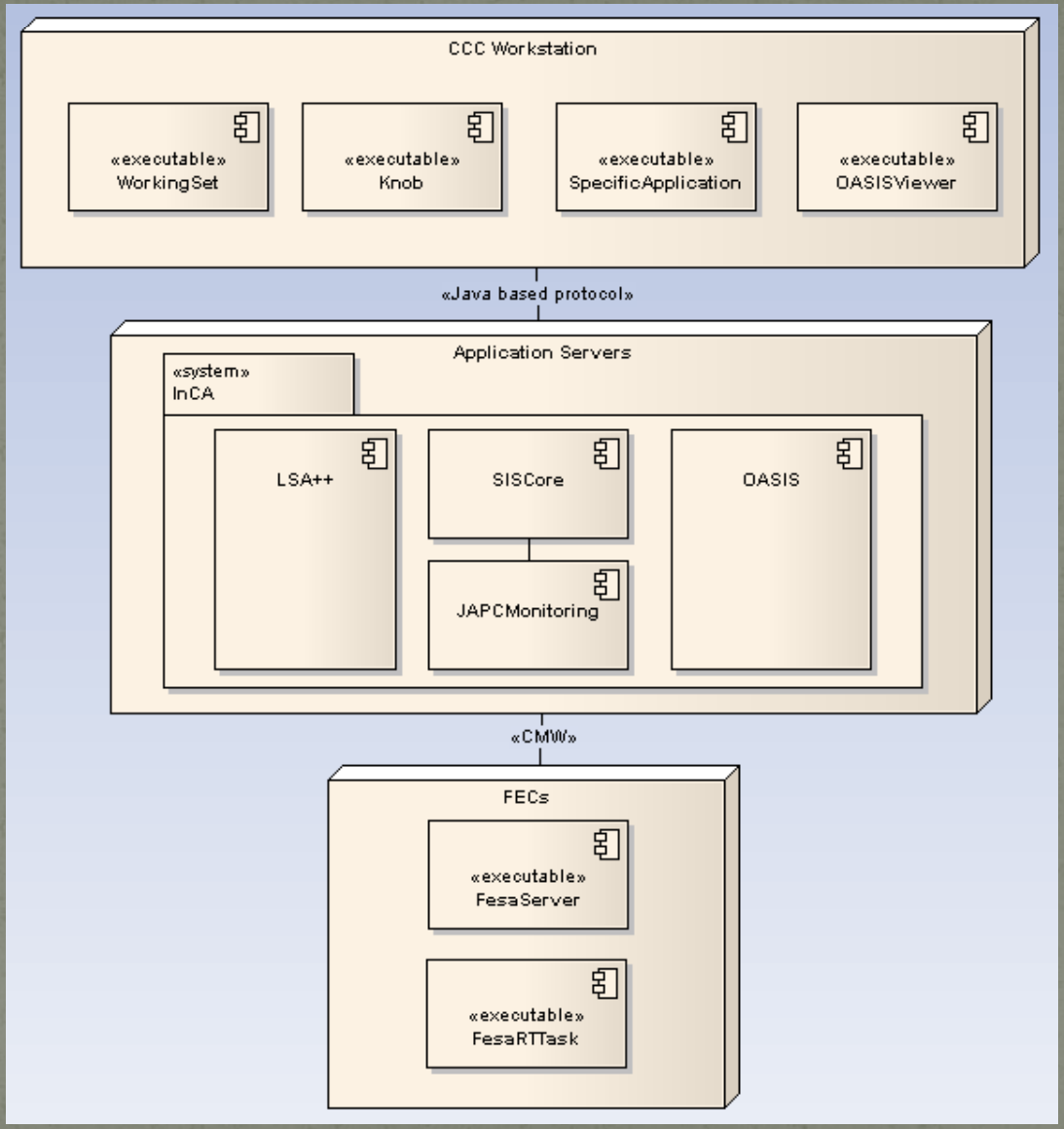
- ✓ Reuse CO components
- ✓ Modif. to fit Injector needs

3-tier Architecture



- ✓ Performance
- ✓ Scalability
- ✓ Flexibility
- ✓ Security

Deployment View



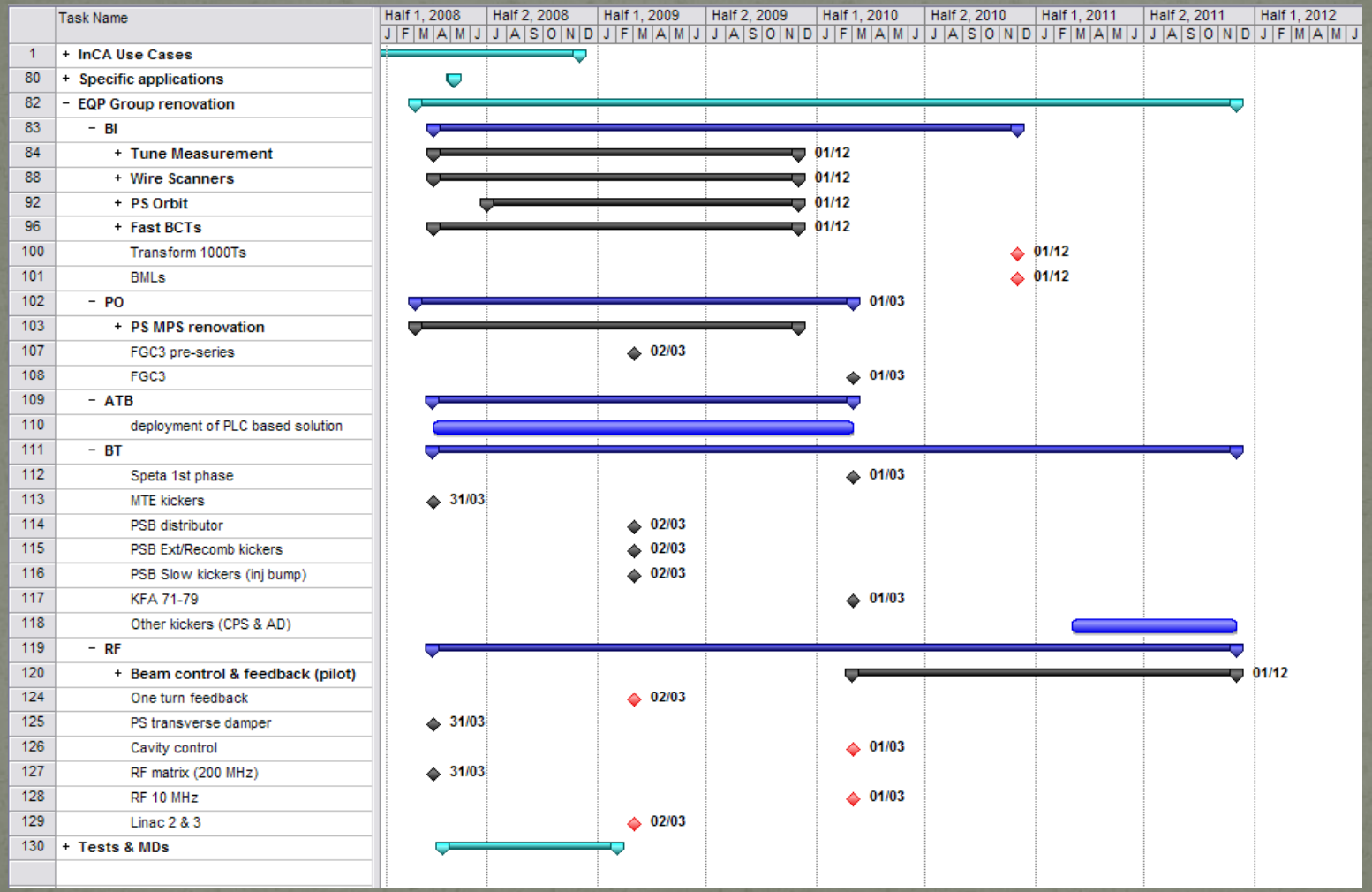
Agenda

- PS Complex Control Software Renovation WG
- Requirements - What Services?
- Solution Evaluation – LSA, PS system.
- Injector Control Architecture
  - Component View
  - 3-tier Architecture
  - Deployment View
- Dependencies with AB groups
- Project Planning
- Risks & Solutions
- Conclusions

Dependencies with AB groups

- Need to synchronise with eqp group renovation programs
  - Ready with high-level controls when they go PRO
  - Not to early to avoid unnecessary development
  - Slow down or speed up their renovation to minimise temporary solutions.
- Close contact with CO3
- 1st round of discussion with eqp groups done

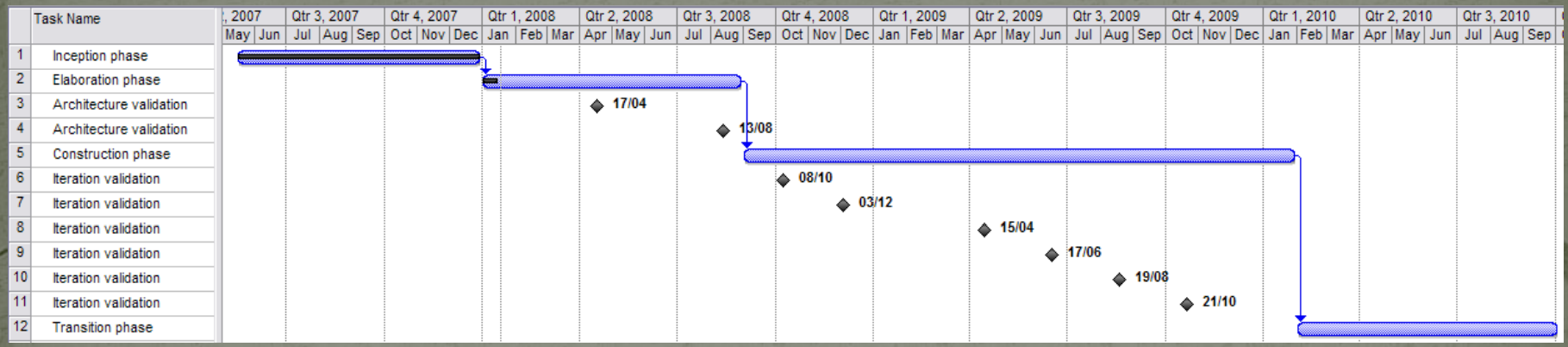
Dependencies with AB groups



Agenda

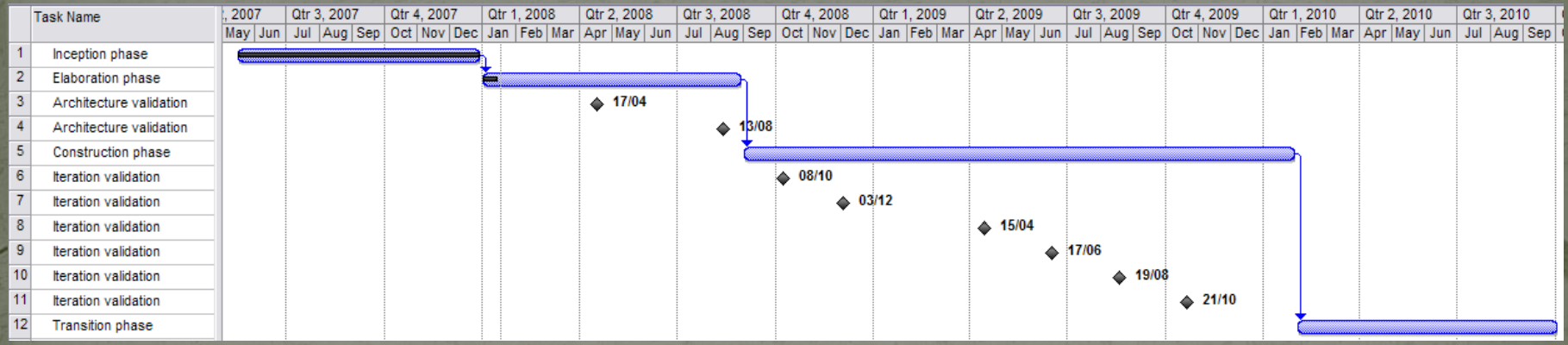
- PS Complex Control Software Renovation WG
- Requirements - What Services?
- Solution Evaluation – LSA, PS system.
- Injector Control Architecture
  - Component View
  - 3-tier Architecture
  - Deployment View
- Dependencies with AB groups
- Project Planning
- Risks & Solutions
- Conclusions

Project Planning (1/3)



- **Inception**: Vision & 1st version Use Case model done.
- **Elaboration**: Validation of the architecture with critical Use Cases implemented:
  - Parameter acquisition.
  - Parameter hierarchy refactoring
  - ABS (hardware renovation)

Project Planning (2/3)

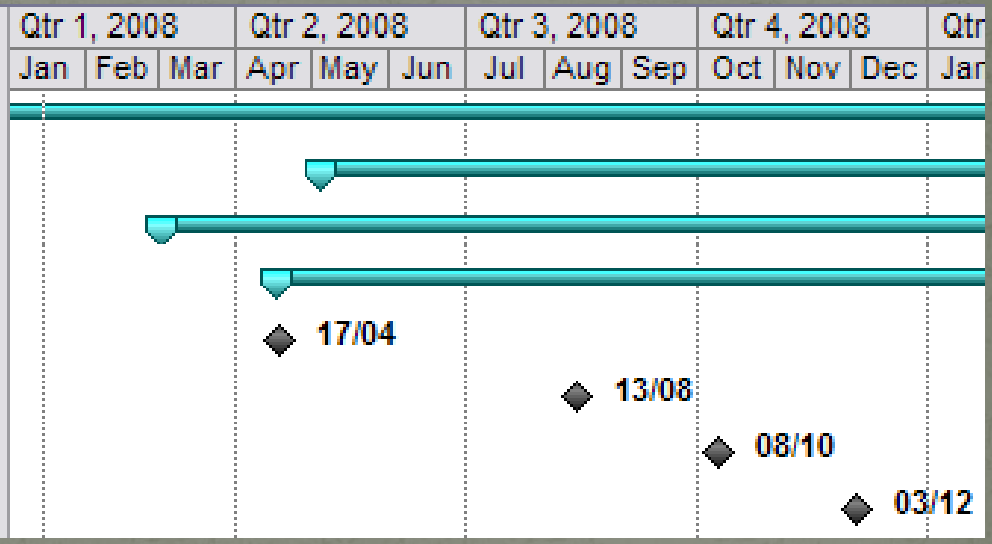


- **Construction**: Implementation of the other Use Cases & Periodic MDs to validate the developments
- **Transition**: InCA in production. Low-priority Use Case development & bug fixes

Project Planning 2008(3/3)

- The system is put in production after few iterations to validate the developments ➔*Machine time needed !*
- Tests foreseen in 2008 (4 * 1/2 day)

	Task Name
1	+ InCA Use Cases
80	+ Specific applications
83	+ EQP Group renovation
131	− Tests & MDs
132	1st Test without beam
133	MD 1
134	MD 2
135	MD 3



Agenda

- PS Complex Control Software Renovation WG
- Requirements - What Services?
- Solution Evaluation – LSA, PS system.
- Injector Control Architecture
  - Component View
  - 3-tier Architecture
  - Deployment View
- Dependencies with AB groups
- Project Planning
- Risks & Solutions
- Conclusions

Risks & Solutions

- Parameter acquisition scalability
  - ✓ To be tackled in 1st prio (elaboration phase).
  - ✓ Need to work in the FEC part as well (vertical picture)
- Changes in the parameter hierarchy model (🡻 & 🡹)
  - ✓ To be tackled in 1st prio (elaboration phase).
- GM classes owned by eqp groups
  - ✓ Close contact with CO3.
- Component-based
  - ✓ Needs work & support from the teams in charge (LSA, SIS, OASIS…).
  - ☝ LHC is still 1st prio but InCA work must be included in plannings.
- Teething problems
  - ✓ Unavoidable! Reduced effect by periodic MDs.

Agenda

- PS Complex Control Software Renovation WG
- Requirements - What Services?
- Solution Evaluation – LSA, PS system.
- Injector Control Architecture
  - Component View
  - 3-tier Architecture
  - Deployment View
- Dependencies with AB groups
- Project Planning
- Risks & Solutions
- Conclusions

Conclusions

- PS Renovation Working Group
  - Summary of the PS complex requirements. Vision & Glossary in EDMS (doc no **863516** & **860974**)
  - Evaluation of LSA & PS systems
    - ↳ InCA proposal
- InCA
  - ✓ 3-tier system based on AB/CO modules
  - ✓ Keeps WorkingSet/Know view in the CCC PS bay.
  - ☝ New components & modifications of the existing ones needed to fulfil injector needs.
  - ☝ Close contact with the eqp groups.
  - ☝ Machine time to validate

Questions ?!?

Thank you for your attention!