

Status and Plans for InCA

S. Deghaye
IEFC Workshop 2010

Agenda

- What is InCA?
- What happened in 2009?
 - MDs' results
 - Deployment in LEIR
- What will happen in 2010?
 - PS deployment: Setup & planning
 - Preparation (MD, OP applications)
 - Support Organisation
 - Advantages (e.g. increase number of contexts)

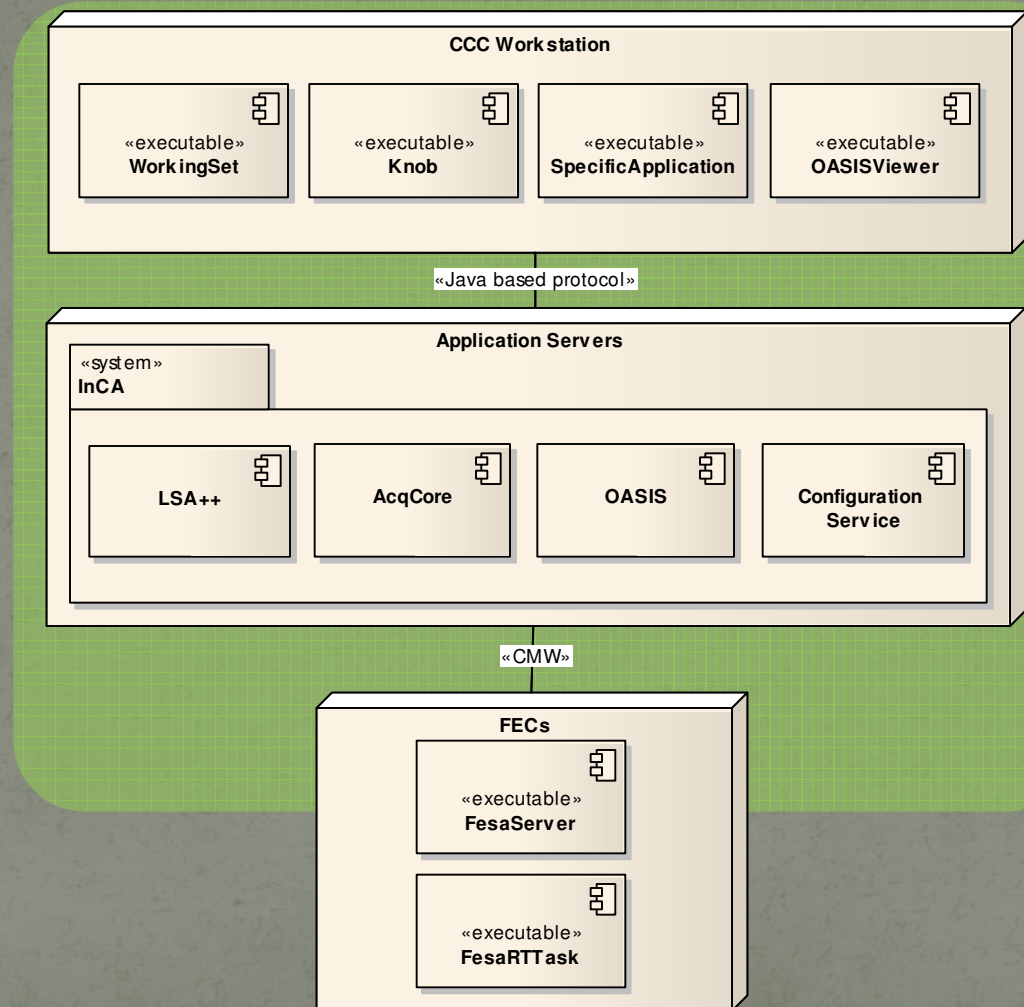
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What is InCA?

- InCA: **I**njector **C**ontrols **A**rchitecture
- Presented in details at the *ATC/ABOC Days'08*
- Renovation of the high-level controls aiming at:
 - Reduce effort duplication
 - Reduce maintenance cost (XMotif)
 - Improve control system performance

What is InCA?



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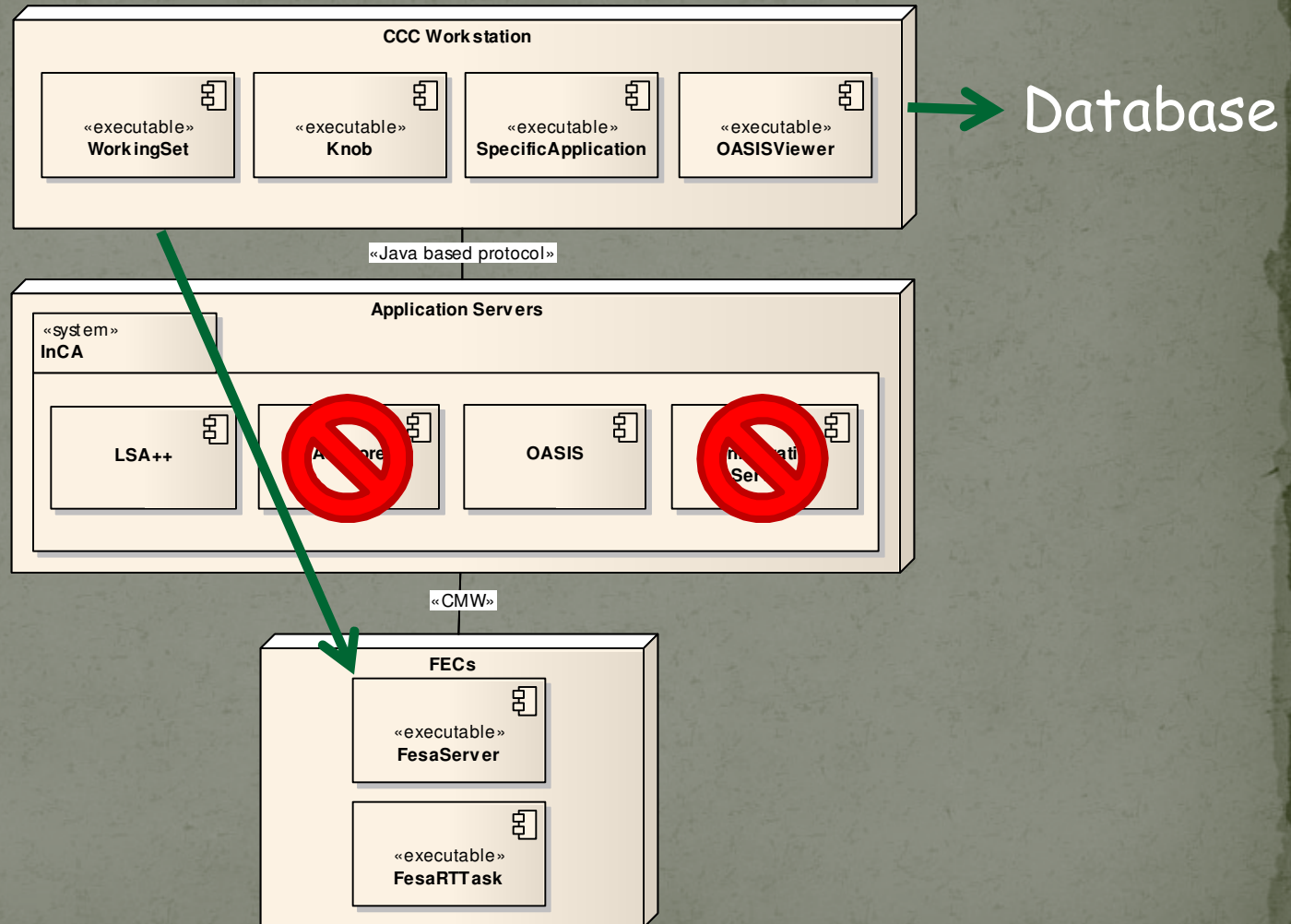
MDs' results

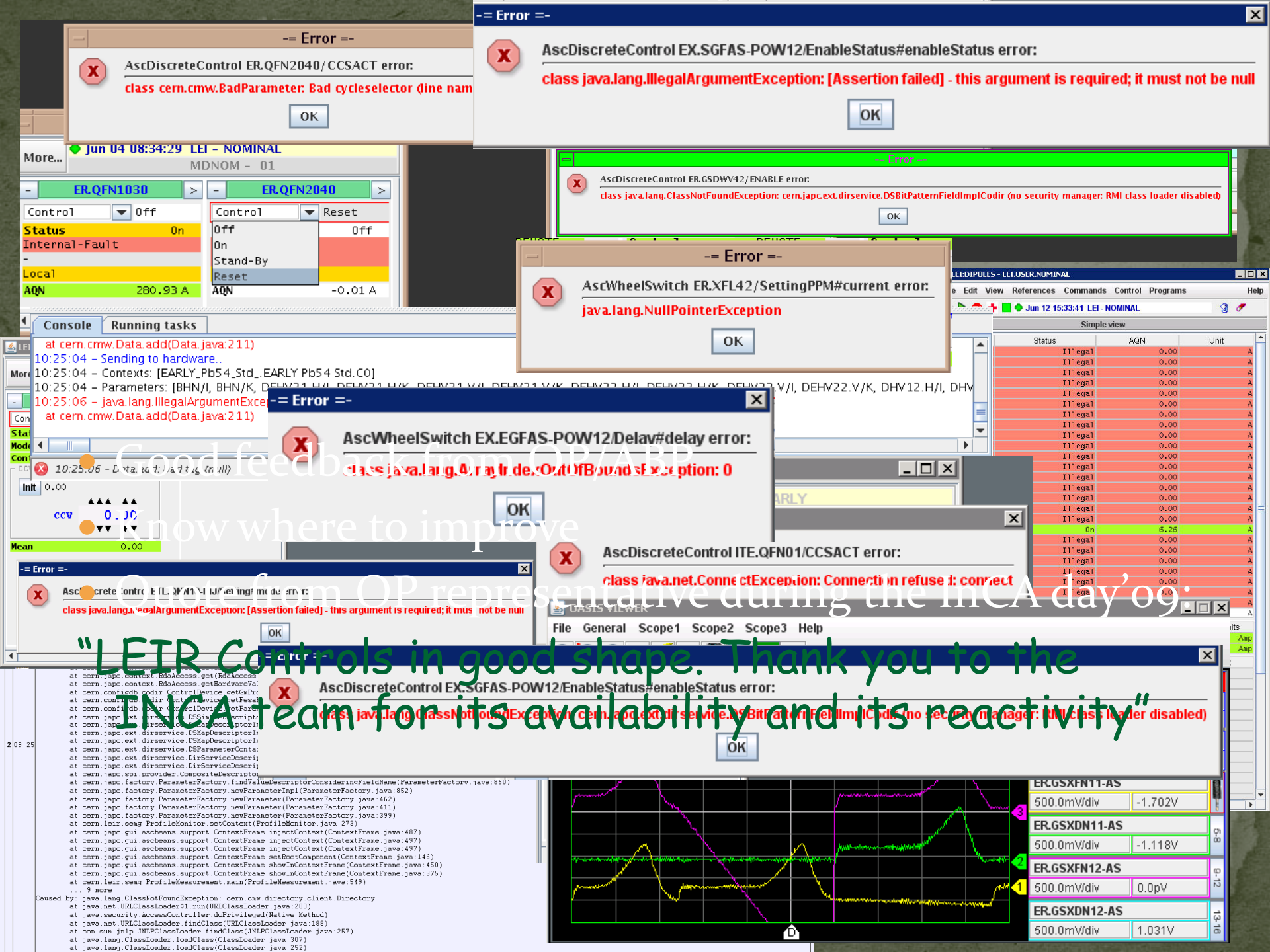
- Original planning approach with regular MD sessions
- 2009 InCA MD Program:
 - 2-day MD after Easter,
 - Many parasitic MDs for the beam steering (YASP),
 - Few smaller MDs during parallel MD sessions (6 hours).
- Very fruitful → We want more!!
 - Feedback on performance & scalability → bottlenecks found & removed
 - User feedback on new tools (FunctionEditor)
 - Main corrections on the PS validated → YASP@PS ready!
 - Need for an InCA test stand identified (2000 devices avail.)

Deployment in LEIR – Why?

- OP/ABP point of view:
 - LEIR control system was hybrid → more difficult to operate (e.g. Archive incomplete & not coherent)
 - InCA could bring a homogenous view of the machine
 - Favourite operational tools would remain unchanged
 - Old XMotif generic tools would be replaced
- CO point of view:
 - Opportunity to have a first partial deployment
 - Proof of concept on a longer period
 - Gather experience

Deployment in LEIR – What?





AscDiscreteControl ER.QFN2040/CCSACT error:
class cern.cmw.BadParameter: Bad cycleselector (line nam

AscDiscreteControl EX.SGFAS-POW12/EnableStatus#enableStatus error:
class java.lang.IllegalArgumentException: [Assertion failed] - this argument is required; it must not be null

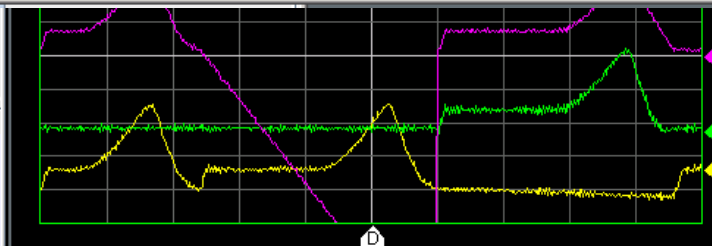
AscDiscreteControl ER.GSDWV42/ENABLE error:
class java.lang.ClassNotFoundException: cern.jpac.ext.dirservice.DSBitPatternFieldImplCodir (no security manager: RMI class loader disabled)

AscWheelSwitch ER.XFL42/SettingPPM#current error:
java.lang.NullPointerException

AscWheelSwitch EX.EGFAS-POW12/Delay#delay error:
class java.lang.OutOfMemoryError: OutOfMemoryError

AscDiscreteControl ITE.QFN01/CCSACT error:
class java.net.ConnectException: Connection refused: connect

AscDiscreteControl EX.SGFAS-POW12/EnableStatus#enableStatus error:
class java.lang.ClassNotFoundException: cern.jpac.ext.dirservice.DSBitPatternFieldImplCodir (no security manager: RMI class loader disabled)



ER.GSXFN11-AS	500.0mV/div	-1.702V
ER.GSXDN11-AS	500.0mV/div	-1.118V
ER.GSXFN12-AS	500.0mV/div	0.0pV
ER.GSXDN12-AS	500.0mV/div	1.031V

“LEIR Controls in good shape. Thank you to the INCA team for its availability and its reactivity”

at cern.cmw.Data.add(Data.java:211)
10:25:04 - Sending to hardware...
10:25:04 - Contexts: [EARLY_Pb54_Std_, EARLY Pb54 Std. C0]
10:25:04 - Parameters: [BHN/I, BHN/K, DELV21.V/K, DELV21.V/K, DELV21.V/K, DELV21.V/K, DELV22.V/K, DELV22.V/K, DELV22.V/K, DELV22.V/K, DELV22.V/K, DELV22.V/K, DEH22.V/K, DHV12.H/I, DHV12.H/I]
10:25:06 - java.lang.IllegalArgumentException: [Assertion failed] - this argument is required; it must not be null
at cern.cmw.Data.add(Data.java:211)

10:25:06 - java.lang.IllegalArgumentException: [Assertion failed] - this argument is required; it must not be null
at cern.cmw.Data.add(Data.java:211)

Caused by: java.lang.ClassNotFoundException: cern.cmw.directory.client.Directory
at java.net.URLClassLoader\$1.run(URLClassLoader.java:200)
at java.security.AccessController.doPrivileged(Native Method)
at java.net.URLClassLoader.findClass(URLClassLoader.java:188)
at com.sun.jain.URLClassLoader.findClass(URLClassLoader.java:257)
at java.lang.ClassLoader.loadClass(ClassLoader.java:307)
at java.lang.ClassLoader.loadClass(ClassLoader.java:252)

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PS deployment: Setup & Planning

- Same setup as in LEIR + YASP for beam steering
 - Acquisitions done in 2-tier
 - Old status algorithm used on the workstation
 - Direct DB access
- Three tentative dates (LHC technical stop):
 - Week 26 (28-06-2010)
 - Week 30 (26-07-2010)
 - Week 35 (30-08-2010)
- 2-day MD (week 17) to assess the readiness and decide on the release date

PS deployment - Preparation

- Before the MD in April:
 - DB preparation (cycles, parameters) - 90% to be done
 - Solution for XMotif applications in place
 - InCAification of the Java applications - 80% to be done
- Before the release date:
 - OP Training to the new concepts (YASP, resident cycles, Settings DB...)
 - Support team operational
 - Expert/OP training in InCA troubleshooting
 - InCAified environment i.e. InCA applications in CCM...
 - Monitoring infrastructure (DIAMON)

PS deployment - Support

- Very important topic.
- 3-step response:
 - Troubleshooting guide for OP
 - Expert support team reachable 24/7 on a fix phone no
 - Fall-back solution ready in case of big troubles
- Presence in the CCC during working hours for the 1st weeks

PS deployment - Advantages

- Immediately:
 - Quite transparent as seen in LEIR
 - Settings history
 - Much faster archiving
 - YASP for beam steering + optics for other applications
 - New FunctionEditor
 - More contexts than users
- Later:
 - Less load on the FECs, the CCC workstations and the DB
 - Quicker start-up for popular working sets
 - Virtual parameters in control & acquisition
 - ...

Limitation of the number of users

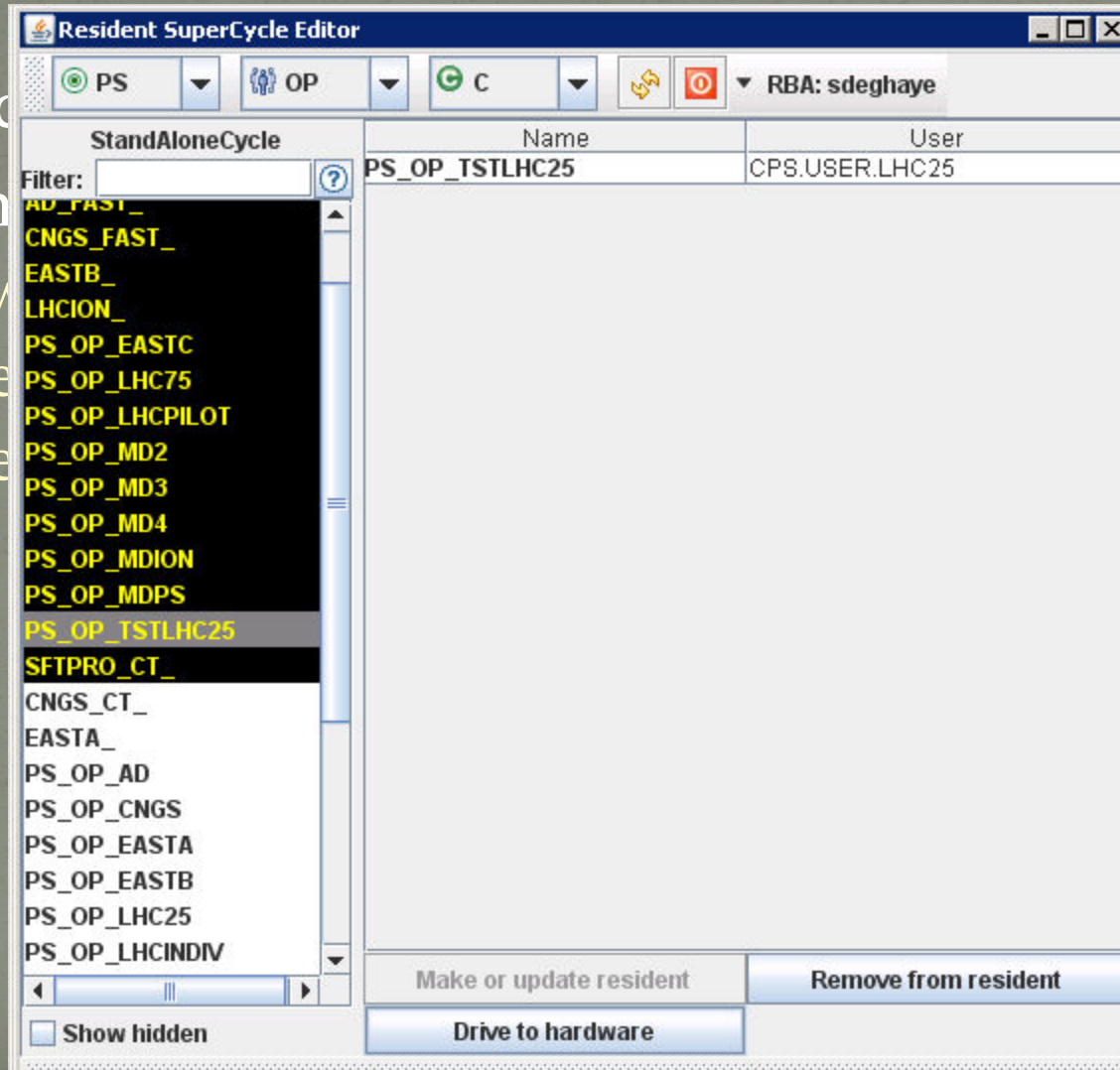
- Limited number of users – 24 in the PS Complex
- More is needed as more beams are produced on a regular basis
- At a given moment, there are never 24 users programmed in the central timing sequences
- Two solutions:
 - Increase the number of users in the FECs
 - Not realistic in the short term.
 - InCA solution
 - Available in the PS in 2010, in the PSB in 2011

Solution at low-level – Why not?

- Some pieces of hardware have the 24 in hard
 - Need to renovate the installations → need a long shutdown.
- GM classes: Difficult to assess how tight to 24 they are
 - Effort with little future as GM is replaced by FESA
- XMotif applications: how many times 24 has been hard-coded?
 - Effort with little future as XMotif is replaced by Java
- For both cases, tricky to find all the occurrences → High risk of failure (always at the wrong time)

InCA Solution

- Introduction
- The Components
 - are always available
 - can be added
 - can be removed



Conclusions

- 2009 = Very good year for InCA:
 - Fruitful MDs
 - Successful deployment in LEIR
- 2010 = Challenging year for InCA:
 - Decisive MD in April
 - First PS deployment in June (or July/August)

Questions ?!?

Thank you for your attention!