SOLARIS

NATIONAL SYNCHROTRON
RADIATION CENTRE

JAGIELLONIAN UNIVERSITY
IN KRAKOW

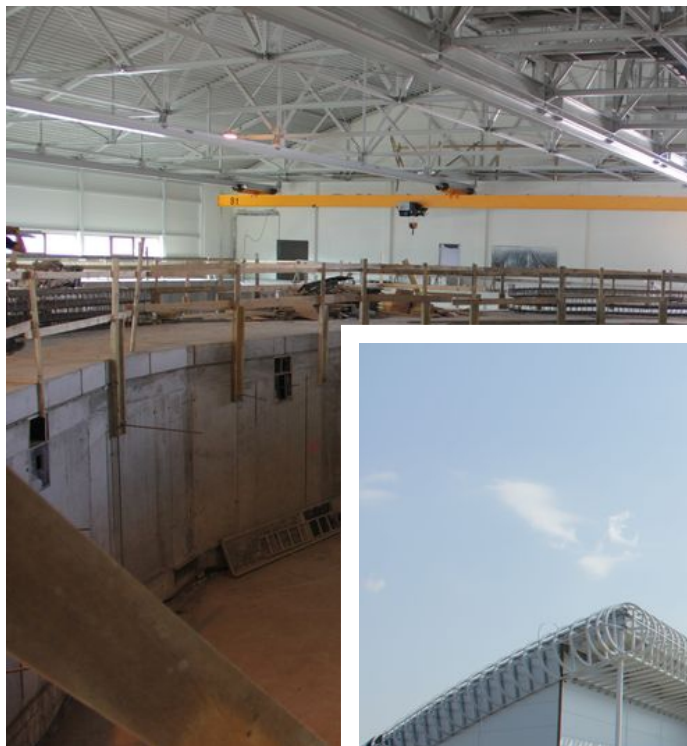# Control and IT Systems status and strategy

ALBA, 24-05-2013
Piotr Goryl on behalf of Michał Ostoja-Gajewski, Krzysztof Wawrzyniak, Łukasz Żytniak, Tadeusz Szymocha, Julia Szota, Jan Kulanek and whole Team Solaris
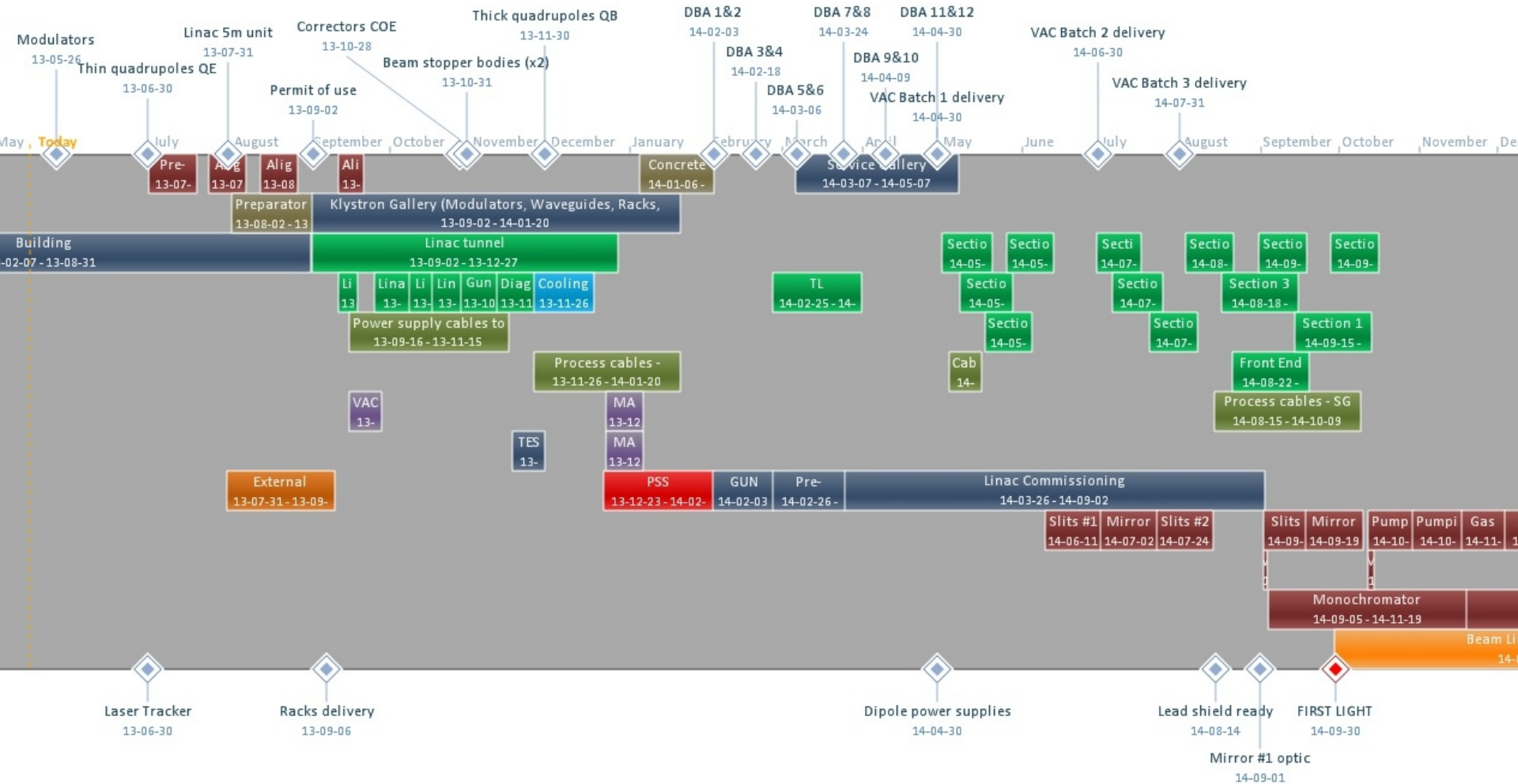
Previous Meeting

Now

- **Timing system – waiting for the detail design that includes storage ring**

- **BPM system – contract signed:**
  - Hardware: Linac - September 2013, Storage Ring – February 2014
  - On going design of FOFB layout

- **Oscilloscopes / Oscillators**
  - MAX-IV is analyzing offers
  - We expect to announce the procurement by end of June, 2013

- **PLC hardware**
  - The procurement will be announced begining of June, 2013

- **Motion control**
  - Joining the IcePAP collaboration

- **Rack cabinets**
  - The procurement for framework agreement will be announced beginning June 2013

- **Computer network**
  - Preparation for procurement, delivery expected in September 2013

- **Servers and workstations**
  - Preparation for procurement, delivery expected September 2013

- **Common**
  - **GeoSynoptic – upon development by Lukasz**
  - **The elegant – available on PLGrid infrastructure in production**
  - **Virtual Accelerator – in preparation, full featured prototype planned to be ready in June**
- **Linac**
  - Low-level – development in progress at MAX-IV
  - High level
    - Gathering requirements for GUI (graphical user interface)
    - Physics code - starting work at MAX-IV
- **Storage ring**
  - Low-level – most is the same as for the linac, main difference:
    - Danfysik power supply
    - RF plant
    - LLRF – software delivered with the system (ALBA / MAX IV)
  - High level – MAX-IV is performing requirements gathering
- **Beam line**
  - Lukasz is gathering requirements to be finished end of June
  - Low-level software – as much as possible the same as for rest of machine
  - High-level software will be based on the Sardana package

- **Existing collaborations**

  - **MAX IV – duplication of the systems**

  - **Elettra – whole lot of consultancy, includes (among others):**

    - **Design and development of the energy ramping software**

    - **PSS**

- **Services to be procured as frameworks for work outsourcing**

  - **Main Design and Installation Service**

    - Signal and computer network cables routing, fabrication and installation

    - PLC systems design, fabrication and installation

    - Rack cabinets population with the equipment including design of internal cabinets' layout

  - **Tango Installation and Development Service**

    - Acquire software from MAX-IV

    - Deployment of the software at SOLARIS

    - Tango software development including the beamline

    - Assistance during commissioning (debugging)

- **Separate procurements for main hardware components to assure we have these on time**

  - PLC hardware

  - Rack Cabinets

  - Computer network active equipment

- **Auxiliary tasks passed to students**

- **Software**

  - **High- and mid-level**

    - 40 different software packages identified by the Elettra as required to start commissioning

  - **Low-level**

    - 18 device server classes implementing communication protocols

    - 39 different devices to be integrated (using protocols above)

- **Strategy**

  - **Tango high-level and low-level software provided by MAX-IV**

    - **MAX-IV implemented SCRUM methodology**

      - Good for change management

      - Detail plans with 2 weeks span, backlog of pending tasks

      - This requires constant monitoring but enables rescheduling

    - **Tango Installation and Development Service to handle transfer of the software to Krakow**

      - This will lower the risk

      - Plans to involve PhD. students to assure knowledge lasting

  - **Differences will be covered by the service contracts**

    - **Software ramping** – will be developed by the Elettra

    - The Tango Installation and Development Service

- **Physics code**
  - Involvement in development at MAX-IV / reuse of the existing codes
  - Use of MATLAB with the TANGO Binding and the Matlab Midle Layer
  - Trainings for physicists on writing scripts for Tango
  - Extensive computations are done at the PLGrid clusters
  - Virtual Accelerator within the SynchroGrid (PLGrid)
- **Supporting application**
  - **Usage of service contracts and collaborations**
  - **Electronic logbook to be decided**
    - one is actually upon development by the PLGrid
    - from other laboratories
  - **Code sharing with the MAX-IV**
    - Two repositories with version control
    - Binary packages created by each laboratory separately
  - **Code quality**
    - MAX-IV implements Unit Tests
    - Virtual accelerator for scripts and physics code testing

- **Machine Protection System**

  - **Procurement for hardware**
    - Framework agreement
    - Includes minor services for design, development and installations of temporary and auxiliary systems
    - This we should have to assure we have physical equipment

  - **Linac**
    - Adjusting design from MAX-IV, will be finished by the end of June 2013
    - Producing and installation within the Mine Service

  - **Storage Ring**
    - MAX-IV schedule does not comply with our requirements
    - Design, development and installation will be outsourced within the Main Service
    - Design will be shared with MAX-IV

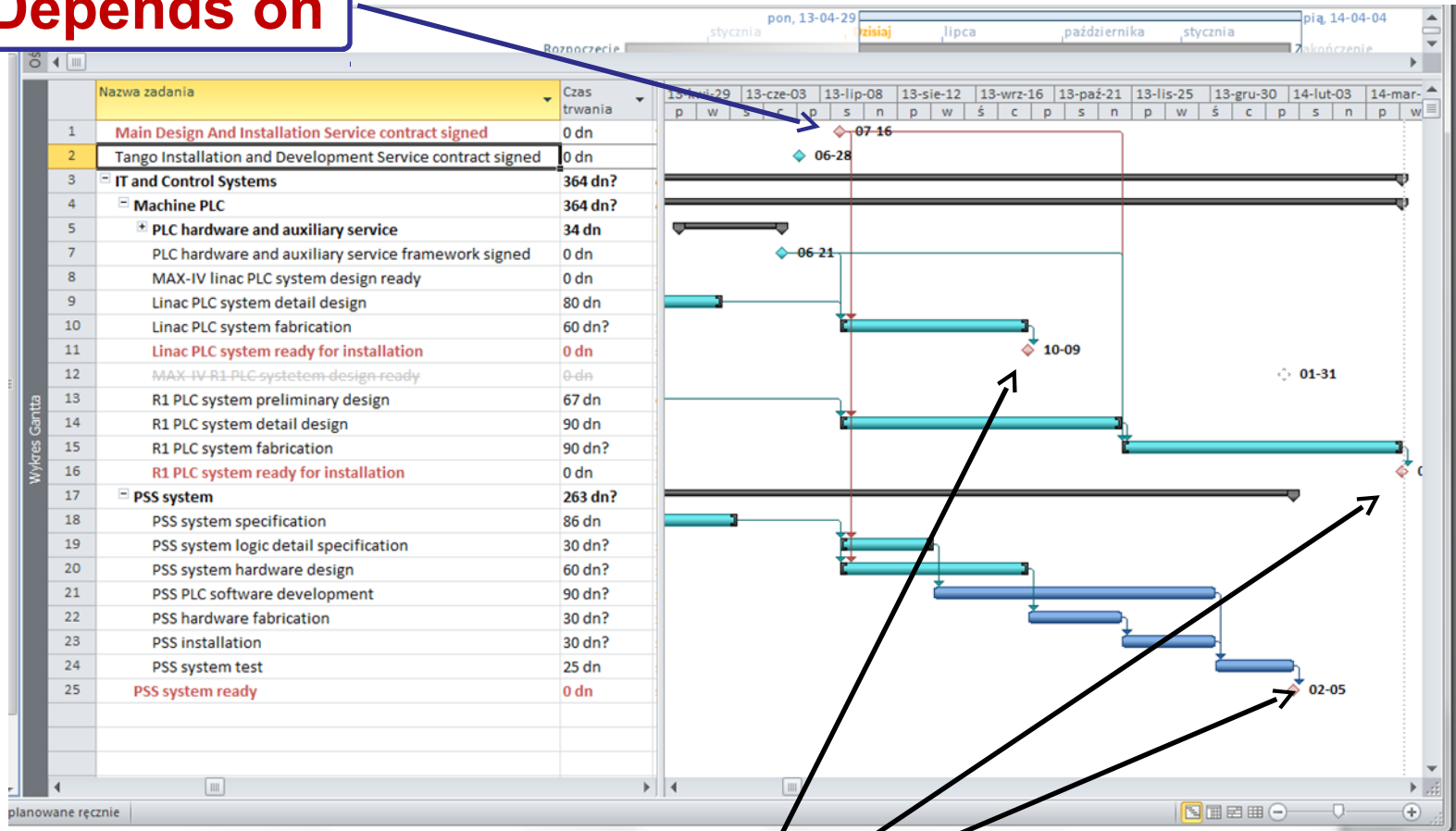- **Personal Safety System**

  - **Implementing schema from the Elettra**
    - Specification ready
    - **Will shorten implementation**

  - **Detail design and implementation**
    - **Within Main Design and Installation Service**
    - **Reuse of the Elettra design**

PLC systems strategy

- **Service contracts will:**

  - lower risks

  - supplement resources

  - cost

- **Tasks to be outsourced**

  - Cabling design and delivery

  - Installation

  - PLC systems design and fabrication

  - Software transfer, deployment and supplementation

- **The software strategy provides a long run risk on knowledge transfer**

  - To be lowered by involvement of students

  - Could be solved when we will have operation budget