Definition of work packages from the diagnostics viewpoint

Summary of the discussion by A. Peters (GSI)

A. Remote maintenance of diagnostic equipment

Stimulating questions:
Are there any items not yet mentioned?
What tools would help you personally in your daily work, if it would exist?
What limitations would you accept and/or expect?
What is most important for you?

Synchronicity
- make sure that what you see is what I see
- Reliable Synchronicity
- Sync with the local ops crew
- Diagnostic – Remote operation should respond as fast as the local system

Security limits
- Machine Operation – Secure access to controls network
- User limits (how many are allowed)
- Controls with remote access in mind (authorization, rules, …)
- Shared ownership responsibility → clear boundaries
- Try to avoid "Big brother is watching you"
- Operation – I would expect clear limitations on computer/network access due to more restricted remote security

Usage
- Same diagtool or specific for remote?
- Same tools available anywhere
- Enhanced GUI
- Really difficult: Save + comfortable

Remote Development
- Bringing diagnostics beyond specification (also hold for other devices)

Controls
- Diagnostics – complete control system available by remote connection
- Access to Devices by 1 Standard Channel
- Remote DG already in Modern Controls
- Remote access: maximal use of diagnostics to improve operation

Communication tools
- acceptable missing video, not acceptable: bad audio
- R D - Establish common technical vocabulary (and) common diag tools
- Tools R D – Webex (Webconferencing tools) looks very promising
**Miscellaneous**
- R.M.O. – Launch prototype work on pattern recognition and comparison with reference diagrams

**B. Remote maintenance of diagnostic equipment**

**Alarming**
- Push or Pull of maintenance info?
- Diagnostic equipment – Remote control /diagnostics of crates, power supplies, fans, etc.
- Recording of parameters creating alarms
- Maintenance- important: very good (complete) self diagnostic of instrument → Alarm to control system

"**Product handling**: Expert vs. normal staff"
- Simple GUIs
- Simple & stupid
- Easy to use
- Maintenance: Access of instrument from Office/Lab

**Design & development process**
- Remote development with all mentioned tools
- Starts with development
- Small projects first
- Common diag interface?
- Diagnostic equipment – more/better interface standards between diagnostics and control systems and less variety
- Remote diagnostics of equipment – define prototype development (…) in order to quantify the effort
- R.M. equipment – Controversy: equipment fault ↔ changing interface signals (timing references): Design systems self triggered
- Set up a checklist which remote functions are mandatory (for devices of a project)?
- Exchange of building blocks: FPGA config + hardware for e.g. oscilloscope function etc.
- Maintenance – each electronic (instrument) should have its own ID
- Extra effort into remote maintenance or into improved reliability?
- Diagnostic equipment – module identification, self tests, Init/Reset procedure built in

**Team / Psychology / Motivation / Social Events**
- Expert ↔ Robot
- Operation / Most important: willingness to record and summarize meetings that occur at odd hours due to requirements
- Sync with local equipment group
- Remote experts not physically close to CR → change OP habits
- Self diagnostics and new (digital) technologies: Level of training of staff?
- Most important: local op is aware of all remote actions
- Issues: involvement of operations limited
- Tools: Same tool for all
- Remote access needs local experts
- Need of certain minimum expertise at host lab
- Absolute transparency (no hidden activity)
- Make personal contacts per video conference: does this work?
- How to make management understand to work on collaboration instead of our "normal" work?
- Reparation of devices can only be done by expert locally
- Social aspects: Be pragmatic!
- Maintenance Tools: Network configurations built on greater trust between collaborating institutions
- Missing informal communication