

ENSRIC

FKA & TVO

**Experience follow up from pilot projects -
Combimatic/Combitrol exchange**

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ENSRIC – Experience from FKA / TVO pilot projects

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1. Background

- Both FKA and TVO are setting up a lifetime management strategy because the age of existing I&C is over 35 years.
- For Vattenfall/FKA - A feasibility was performed by Vattenfall, i.e. to investigate the possibility to exchange individual components or if a larger scope is preferred including to exchange polymeric material. The study should also give a hint of preferred strategy
- Pilot projects were established by FKA and TVO – not co-operated – to also validate the performance of the organisations involved

2. Task, Scope & Schedule

1(2)

FKA:

Task:

Establish a pilot projekt to test the possibility, test the Supplier (component delivery), test the FKA-organisation (design, installation, commissioning) and identify requirements (QC, suppliers test of components, functional tests of the whole cabinet before the installation in the site, test when installed at site)

Estimate the nbr man hour to perform this/cabinet

Scope:

All components [Combimatic/Combitrol/Combiflex] incl. cabinet frame and internal cabling and connections in two cabinets at Forsmark 1.

Schedule:

Start October 2014, finalised in May 2015.

2. Task, Scope and Schedule

2(2)

TVO:

Task:

- test the supplier's capability to meet TVO's requirements
- test how to get STUK's approval for the replacement and measure amount of licensing work needed in the larger modernization project

Scope:

- all components in two cabinets
- improved power distribution
- new documentation
- update the spare part handling.

Schedule:

Started June 2014 and finalised in May 2015

3. Pre-condition and requirements 1(2)

FKA:

- The pilot project shall not effect the outage
- Use the original documentation and test plans for the components
- Functions shall not be changed
- All Combimatic & Combitrol components be new produced
- The QAGO220 shall be replaced by another isolation device, "Knick Amplifier" (lower power consumption and less space)
- Complete test before the installation
- All design for the cabinets and installation performed by FKA (only buy components)
- Use validated equipment
- Normal safety review internally

3. Pre-condition and requirements

2(2)

TVO:

- Audit the Supplier chain incl. Sub-Suppliers
- All design for the cabinets was performed by Supplier
- Installation and testing was performed by TVO
- No functional change
- The pilot project shall not effect the outage
- Use the original documentation and test plans for all components
- Discussions with STUK

4. Differences FKA vs TVO

- FKA performed the design incl. installation of the internals in the cabinets
- TVO ordered the design incl. installation of the internals in the cabinets from the Supplier - Installation was performed by TVO
- FKA replaced the QAGO220's with Knick amplifiers
- TVO focused also on the documentation and power distribution
- FKA selected cabinets with smaller nbr of components vs TVO selections

5. Observations

FKA

- + Used a simplified project form
- + Validate the project model and organisation (incl. get knowlage /training)
- + Time schedule [10 h/cabinets installation & testing – 17 measurements (Combitrol) and 4 object (Combimatic)]
- + Existing documentation was valid
- () Test tool is essential to shorter the test time
- () Generic test procedures are required if a larger scope is to be performed
- () Use existing or new requirements – F1/F2/F3/FRISK/TBE/SL5 ?

TVO

- + Supplier is able to supply components and meet the req.
- + Installation schedule during outage
- + STUK was pleased after the project (no new demands for the future)
- +/- Some milestone were missed, but they didn't affect the overall schedule
- () Time and resources for supporting the Supplier

6. Results

- Both FKA and TVO approaches were successful
- The Supplier delivered as specified and the quality was good
- The time schedules were met
- The installed new cabinets can be deemed as new (lifetime expected to be 30-40 years)

7. Future Challenges

- To keep the competence
- Evaluate the life time of the existing components/cabinets → input to the strategy
- Vattenfall strategy is extend existing platform for 60 years operation.