



UPGRADE STRATEGIES FOR DIGITAL I&C SYSTEMS

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Scope

- Modern I&C systems often incorporate digital components and/or software that contains applications that requires upgrades or new software versions on a regular basis. This means that the utilities can be forced to make modernizations or system upgrades even though the actual system and its implemented plant function itself is working well.
- This study has investigated different strategies on how to cope with these types of upgrades within the Nordic nuclear industry and compare to how other nuclear countries and other types of industries are managing the situation.
- Methodology
 - The study has been based upon experience within the project group and Internet research.



Results

- Nuclear Industry has from the beginning not combined process IT (OT) and administrative IT (IT)
- Nuclear Industry has an OT architecture that makes them less vulnerable to cybersecurity together with a physical protection
- Identified Trends:
 - Follow suppliers' recommendation regarding upgrades and avoid special own developed application
 - Try to use "golden version" which "stretch" the timeframe between upgrades.



Conclusions

A General golden strategy is not possible to identify since Life cycle cost will depend on the powerplant overall strategy - how many years remain to operate.

The life cycle cost also depends on:

- The system status.
- If there is enough competence and that the competence will be possible to maintain.
- If there are spare parts available in case of failure.

This analysis will be system specific and need to be maintained during the system lifetime.





Recommendations

- Recommendations
 - Try to use “golden version” which will “stretch” the timeframe between upgrades and follow the recommendations from system suppliers
 - Secure that system is hardened - reducing its surface of vulnerability
 - Promote System health check
 - Cyber security – be up to date
 - Software
 - Use the functions in the suppliers’ base software instead of requiring the supplier to develop specific functions to meet your requirements as such implementations will be very costly for future upgrades
 - System Architecture
 - Keep the system architecture that is used within the nuclear business