Paris Session 2022

XFLEX HYDRO
Battery Hybrid Feedback

Study Committee A1

PS3 : Developments of Rotating Electrical Machines and Operational Experience question wording and number

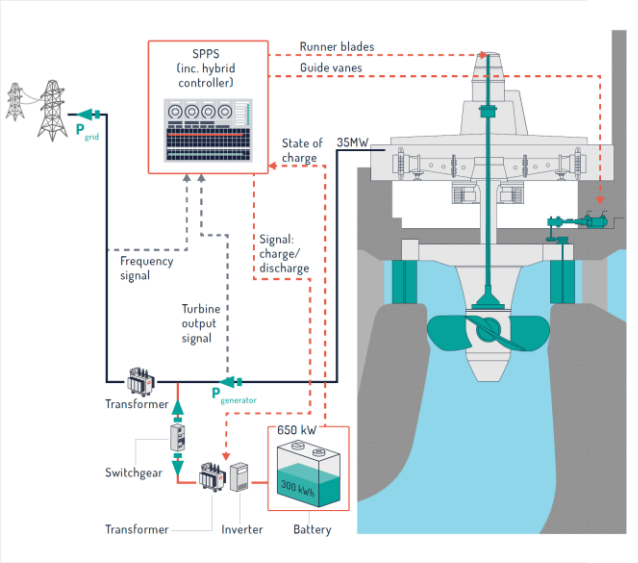
Q3.5 : as the number of controlling systems has increased, how has this impacted the power plant reliability index?

What would be the percentage increase in cost compared to that of the turbine-generator unit?

Jean-Louis DROMMI

Hybrid Unit Reliability Issue

- *Hybrid Unit is a demonstrator*
  - *Its full time operation as hybrid is not a top of the list request*
  - *However, main power unit operation reliability is a must*
- *Hybrid Controler design includes*
  - *Fall back solution returning to hydro stand alone mode is BESS trips or hybrid mode is faulty*
- *Experience Feedback shows*
  - *Fall back solution works perfectly*
  - *BESS tripping occurred due to poorly tuned protection settings (Modbus loss)*
  - *Main power systems and controls never showed reliability issue*



Hybrid Unit Extra Cost

- *Micro Hybrid Concept is based on low CAPEX equipment*
  - *BESS power = 1/5 of full FCR provided by the unit*
  - *BESS price = 1/6 of full FCR transfer to a larger BESS*
  - *In the demo case : 35MW/83rpm generator + 650kW BESS*
    - *BESS price + installation = ~4% of the overall generator price*
- *Payback includes*
  - *Wear & Tear reduction of hydro unit*
  - *FCR compliance to market remuneration*
  - *Fewer off cam operation (Efficiency increase)*