2008 AEC-NRC Bilateral Technical Meeting

Lessons Learned From Forsmark NPP unit 1

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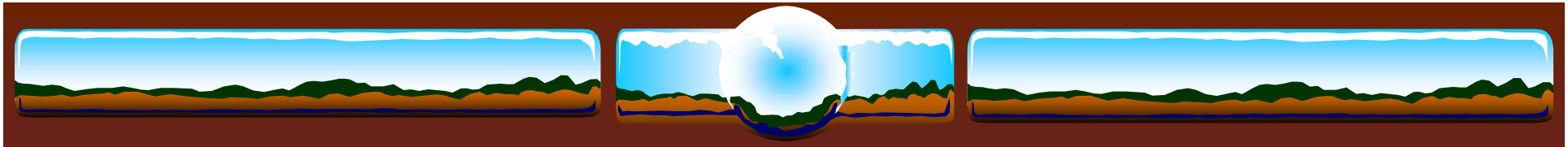

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Regulatory Activities

- Evaluated our related design of operating nuclear plants
  - *Event similar to Forsmark's experience show not occur in our plants due to the circuit design difference.*
    - *Our plants' EDGs start control circuits are direct DC control systems, Forsmark's are AC Vital power systems*
  - *If the plants occur Forsmark event, the important recorders, indicators and process computers of the control room will operating normally.*

Regulatory Activities

- Assess the possibility of equipment malfunction impact

Following Findings are found:

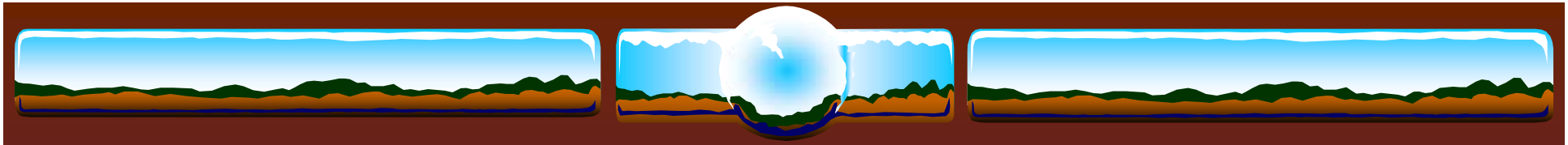
- *If the voltage transient can impact up to UPS buses, it will impact the class 1E DC buses.*
- *The class 1E DC buses voltage transient will affect the equipments availability.*

Regulatory Activities

- Discussion item in AEC-TPC Nuclear Regulatory Conference
  - Follow up TPC's actions
  - Review relative DCRs

Main Conclusions :

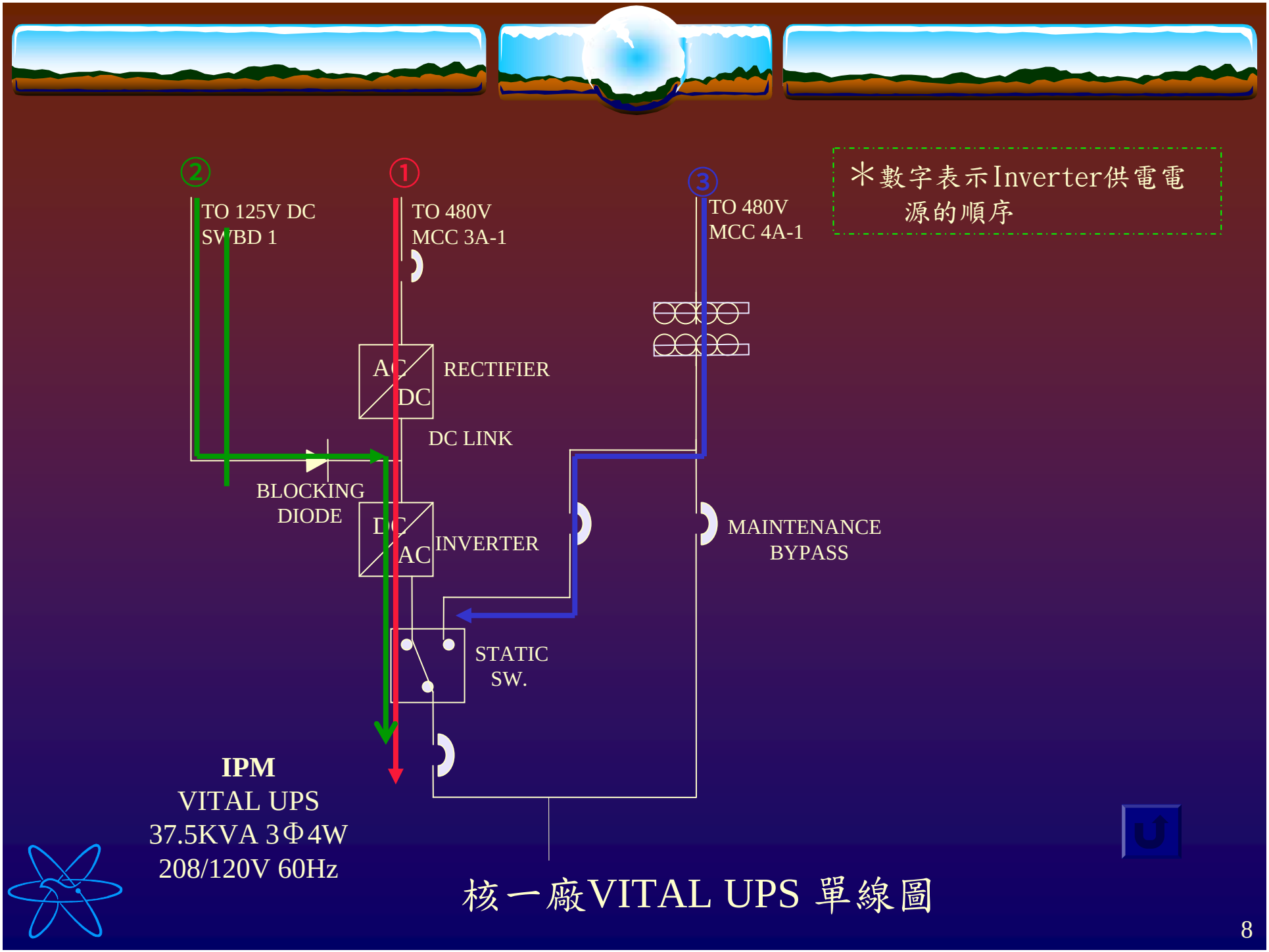
- *Adding Additional Hi-DC voltage shutdown function for all chargers can help reduce the risk of inverter failure, but in order to eliminate the potential failure depend on the good design.*
- *In a safety related UPS DCR of Maanshan NPP, it was noticed that UPS power supply was changed from original dual source to single source. Maanshan NPP was requested to re-evaluate the design change.*



Lessons Learned

- Direct DC control system is more stable than UPS system
- Plant design change should ensure all required functions and should not degrade the system reliability

THE END



核一廠VITAL UPS 單線圖

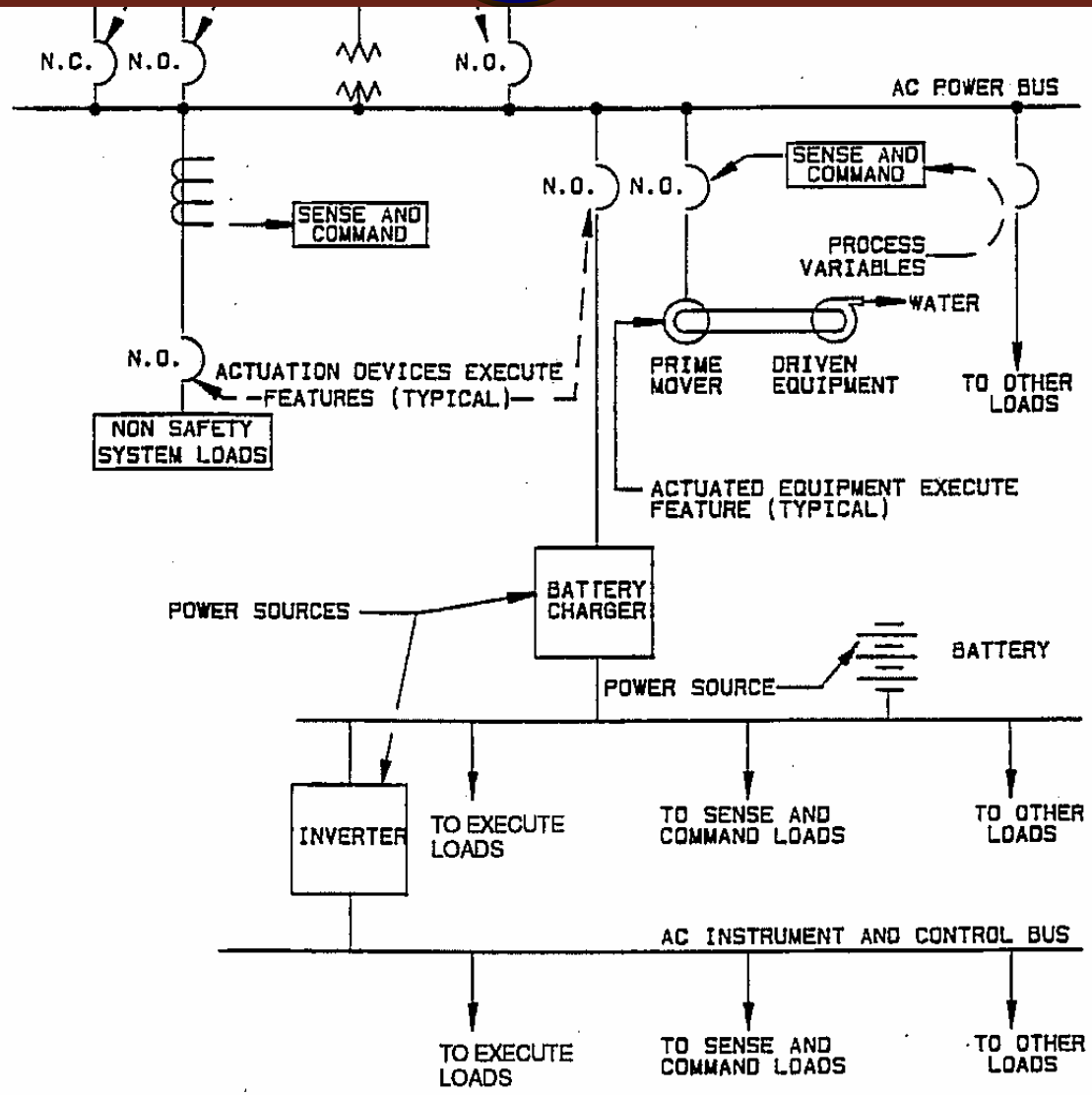
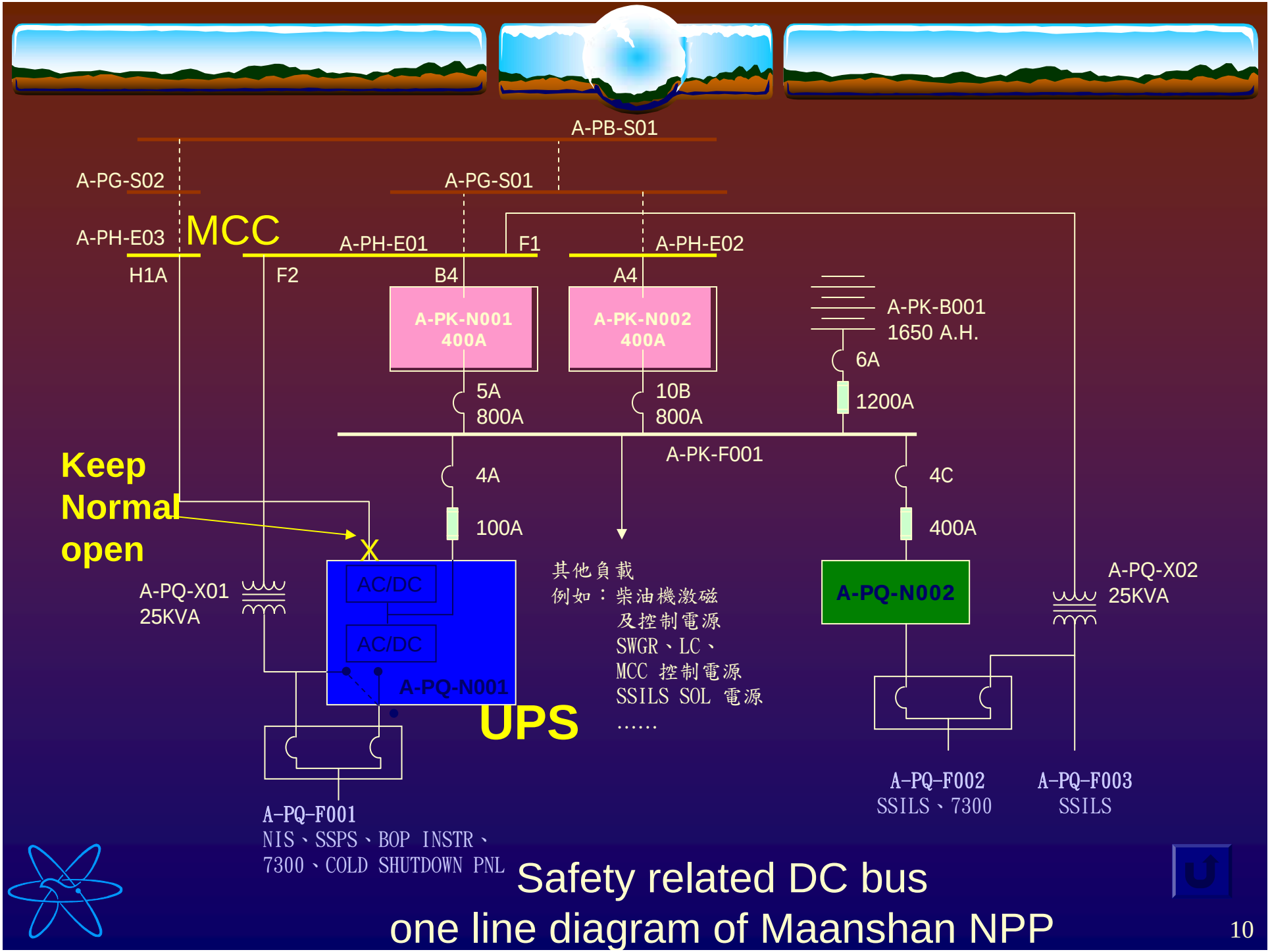


Figure 3—Simplified Electrical One Line Illustrating One Division of a Class 1E Power System



Safety related DC bus
one line diagram of Maanshan NPP