

Disha Das

Human Factors Analysis on NBSR Reactor Console



Background

- Reactor control room undergoing upgrades
- Important to conduct Human Factors Analysis (HFA)



What is Human Factors Analysis?



- Creating a user-friendly product or service
 - Reduce errors
 - Improve efficiency

Why is HFA Important?



Usability



Safety



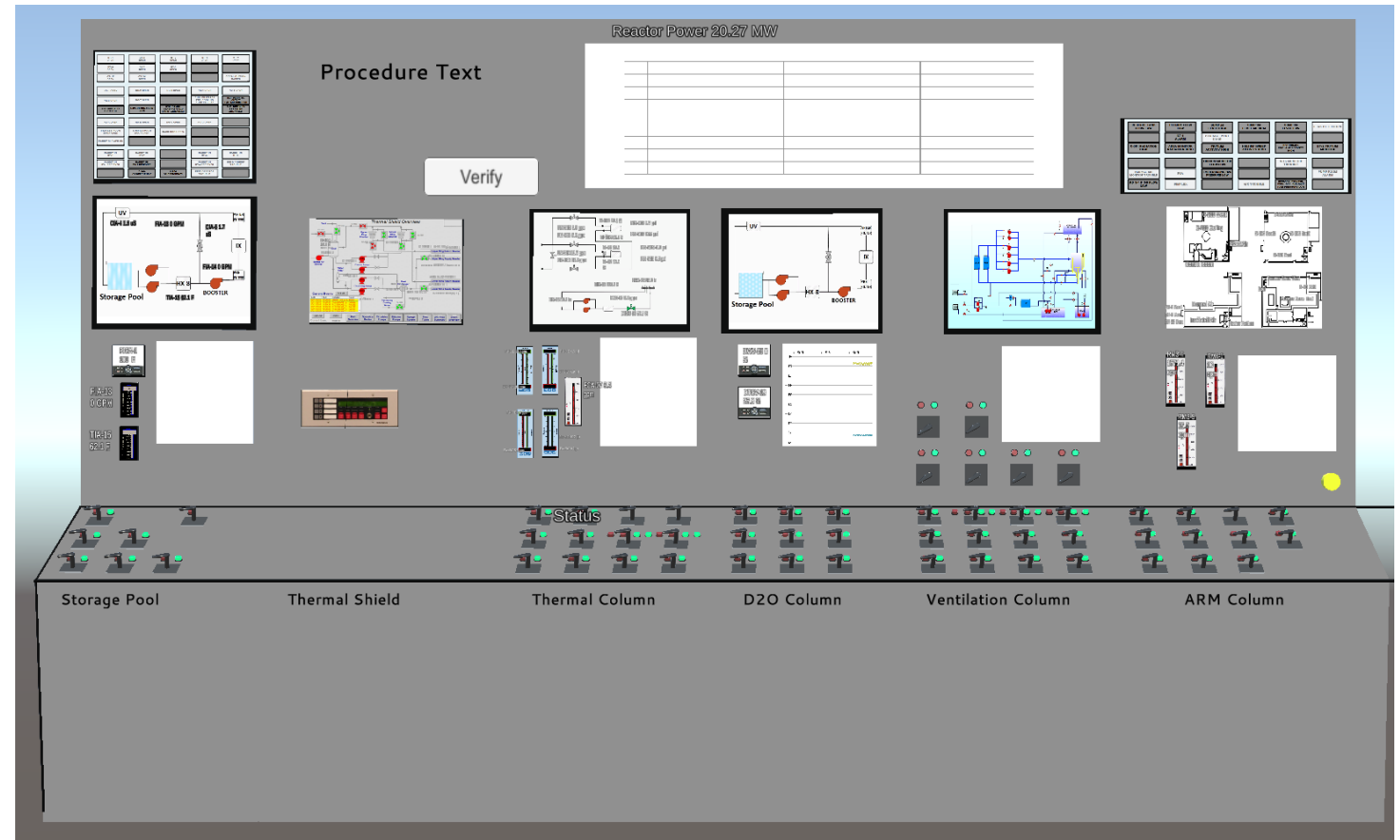
Situational Awareness

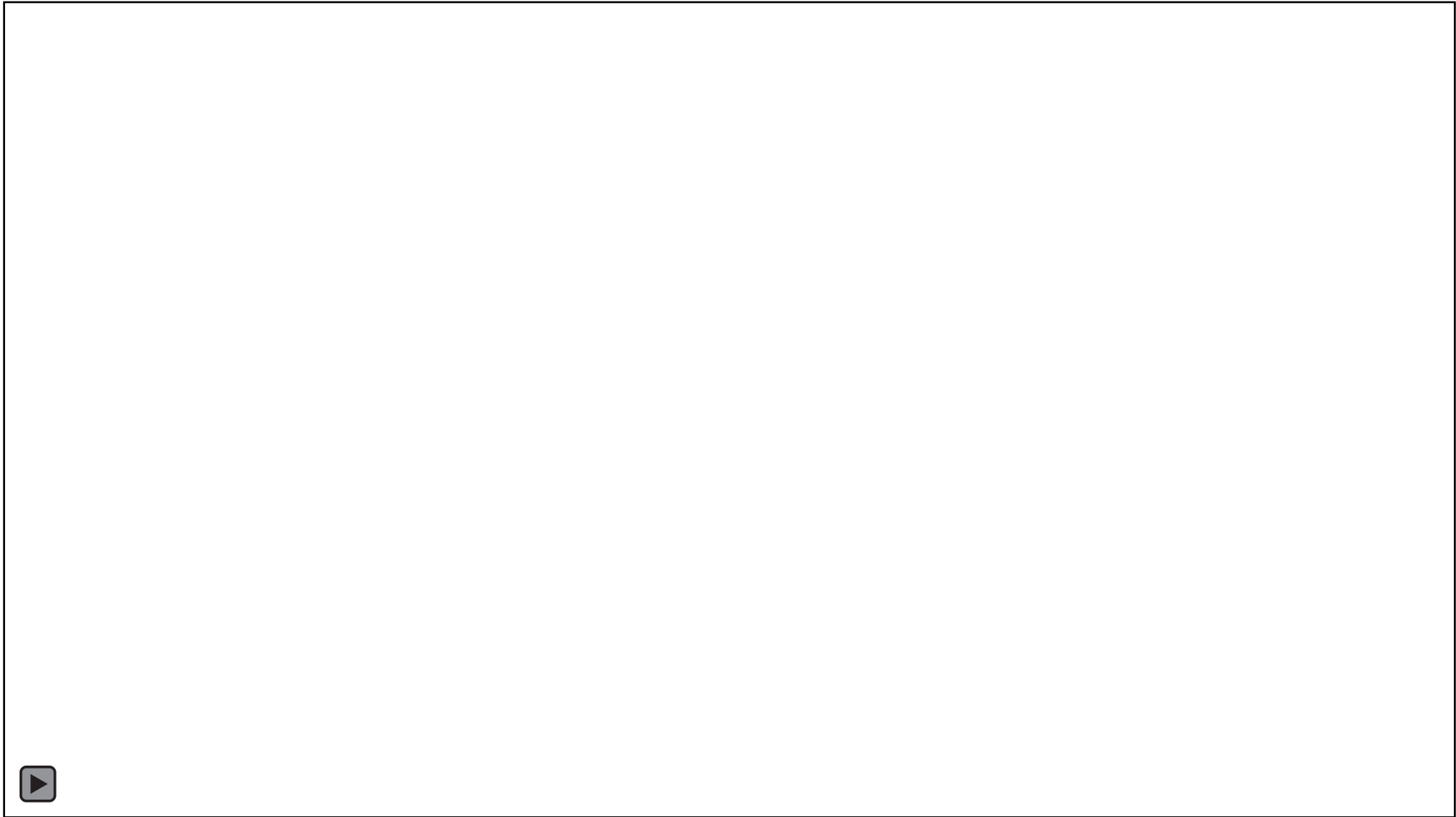


Efficiency

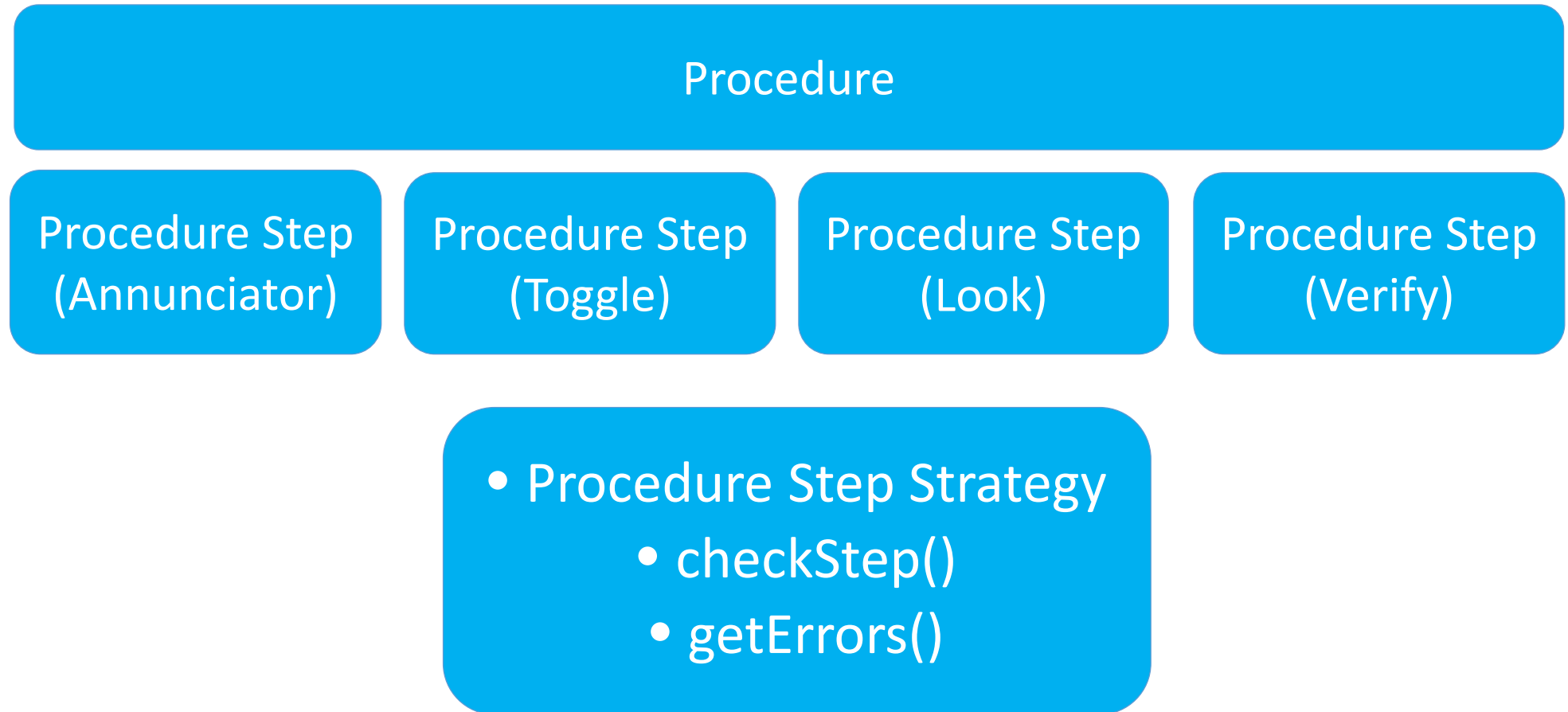
How are we going to do it?

- Physical Model
 - Expensive
 - Difficult to change
- Mixed Reality
 - Portable
 - Extensible
 - Easy to collect data

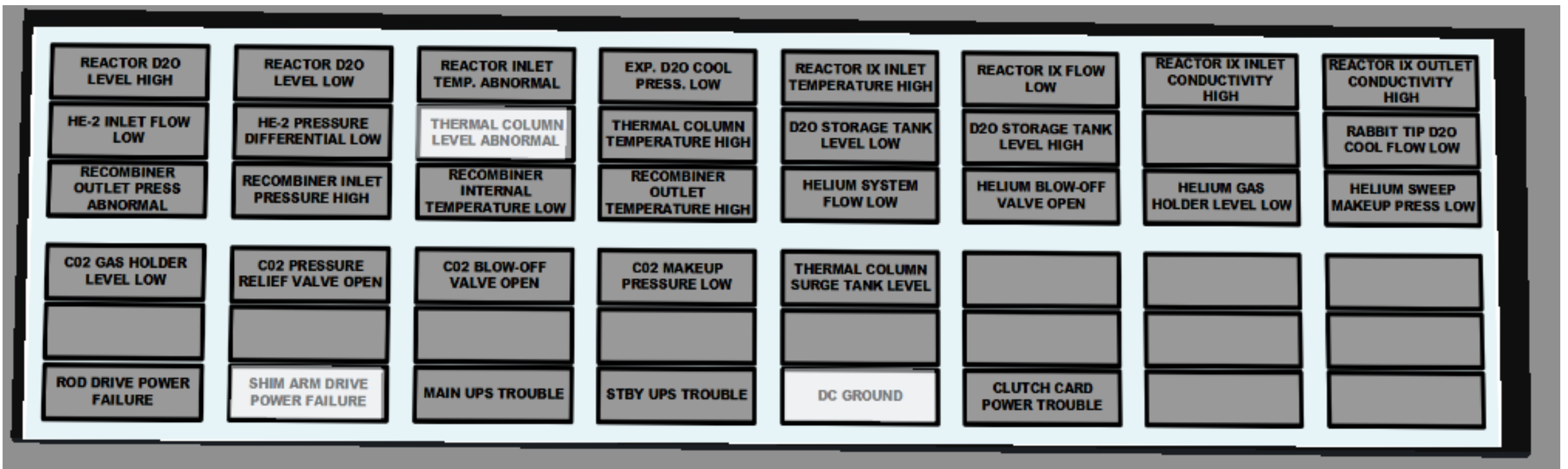




Procedure System



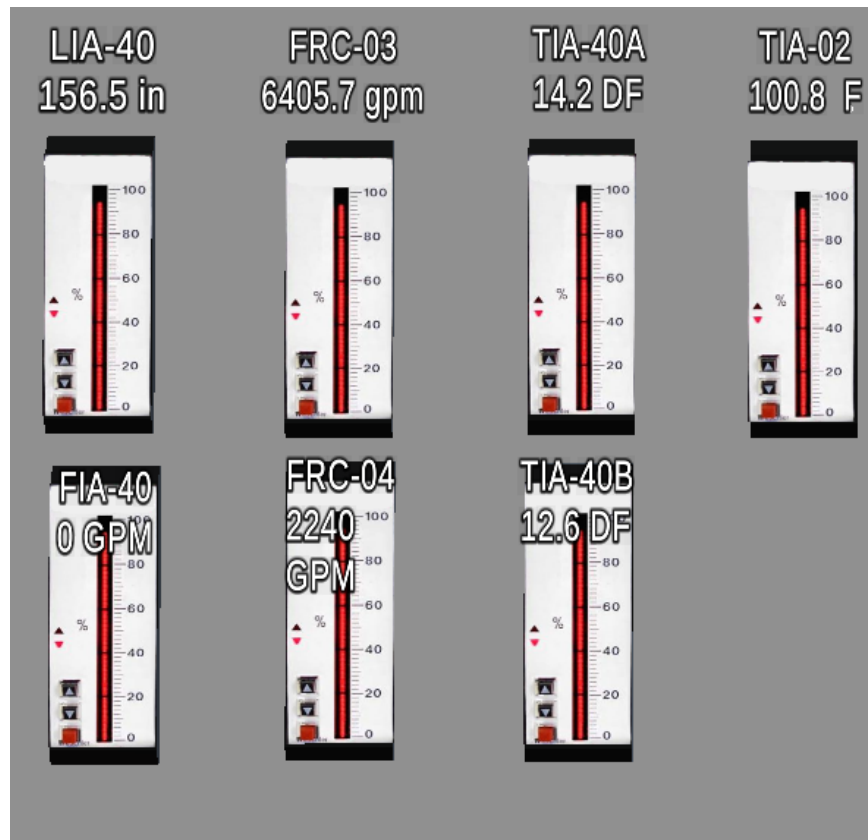
Annunciator



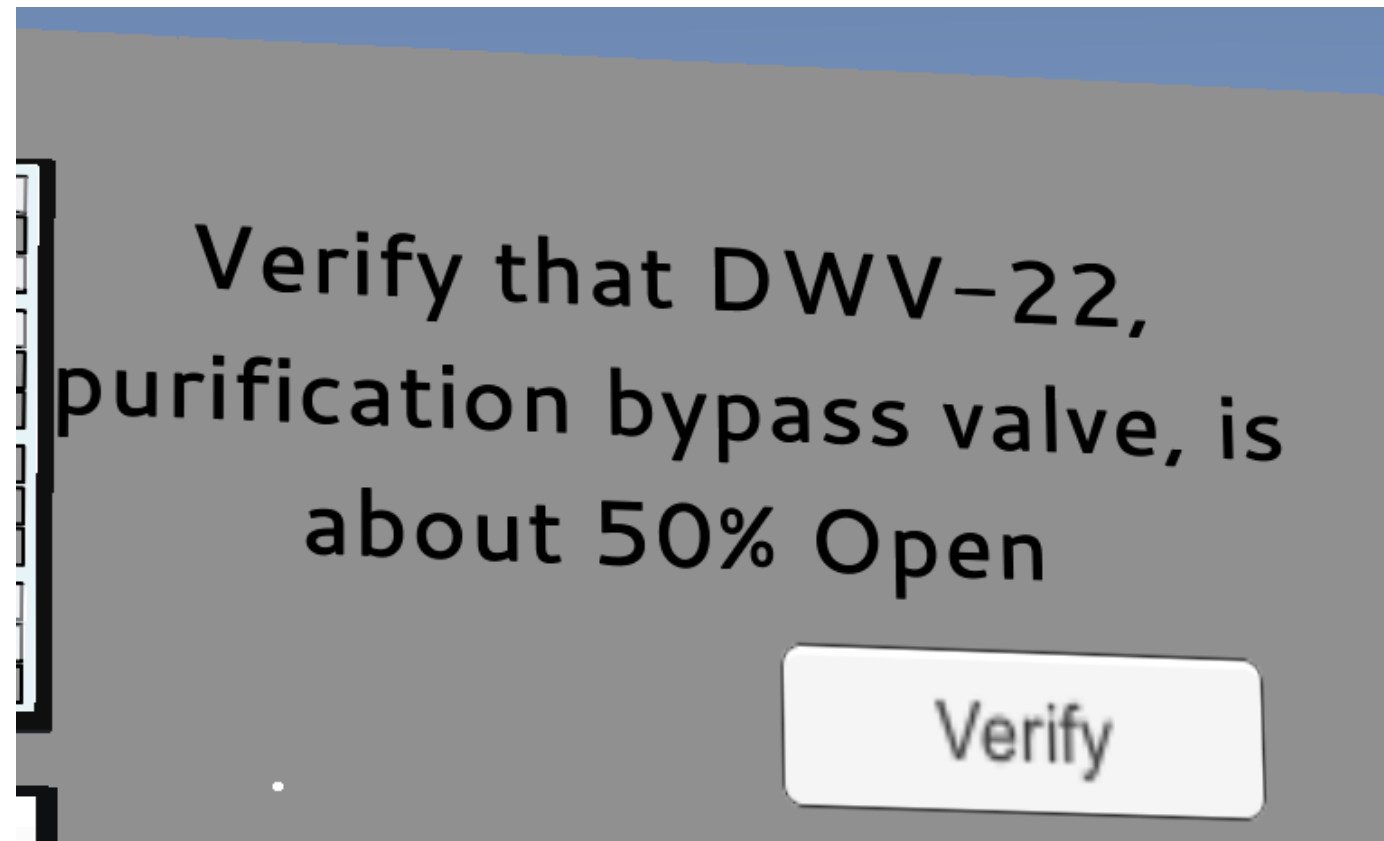
Toggle



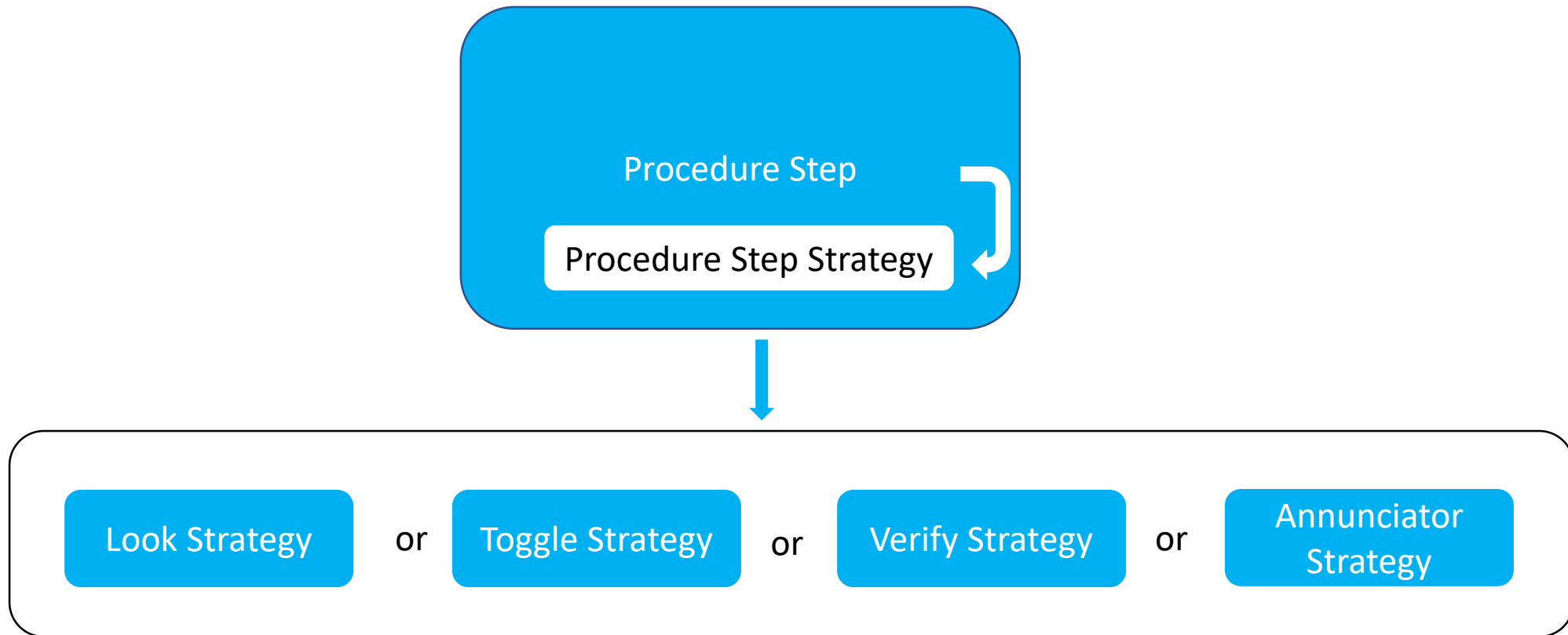
Look



Verify



Procedure Step Strategy

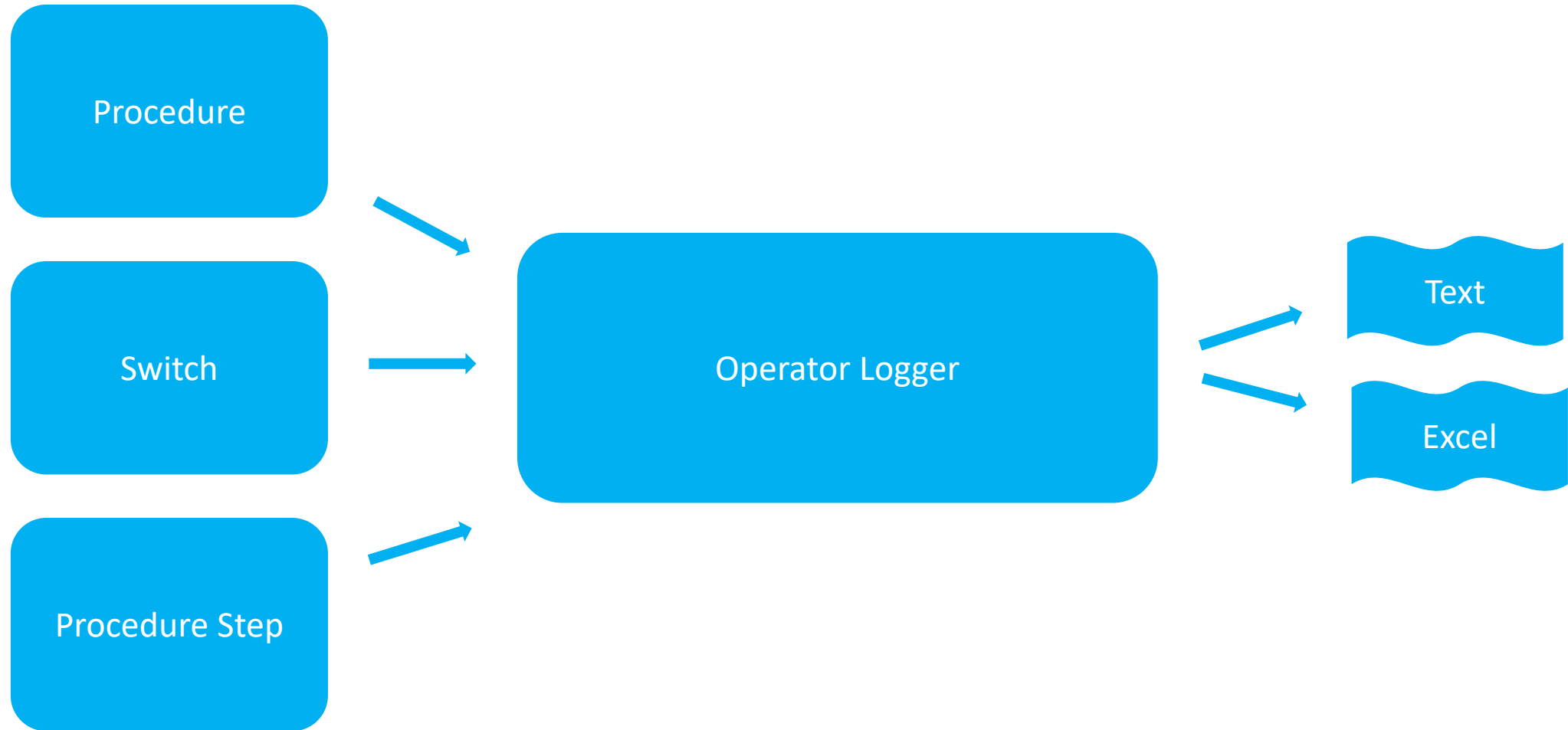


Human Factors Analysis

- Timer
 - Individual Procedure Step
 - Entire Procedure
- Errors
 - Type of Error
 - Number of Errors

Procedure Step Description	Step Time (seconds)	Errors
Place D2O storage tank pump (#1) in AUTO	13.02	Switch D2O Stor Tank Pump #1 was changed from off to on
		Switch D2O Stor Tank Pump #1 was changed from on to off

Operator Logger



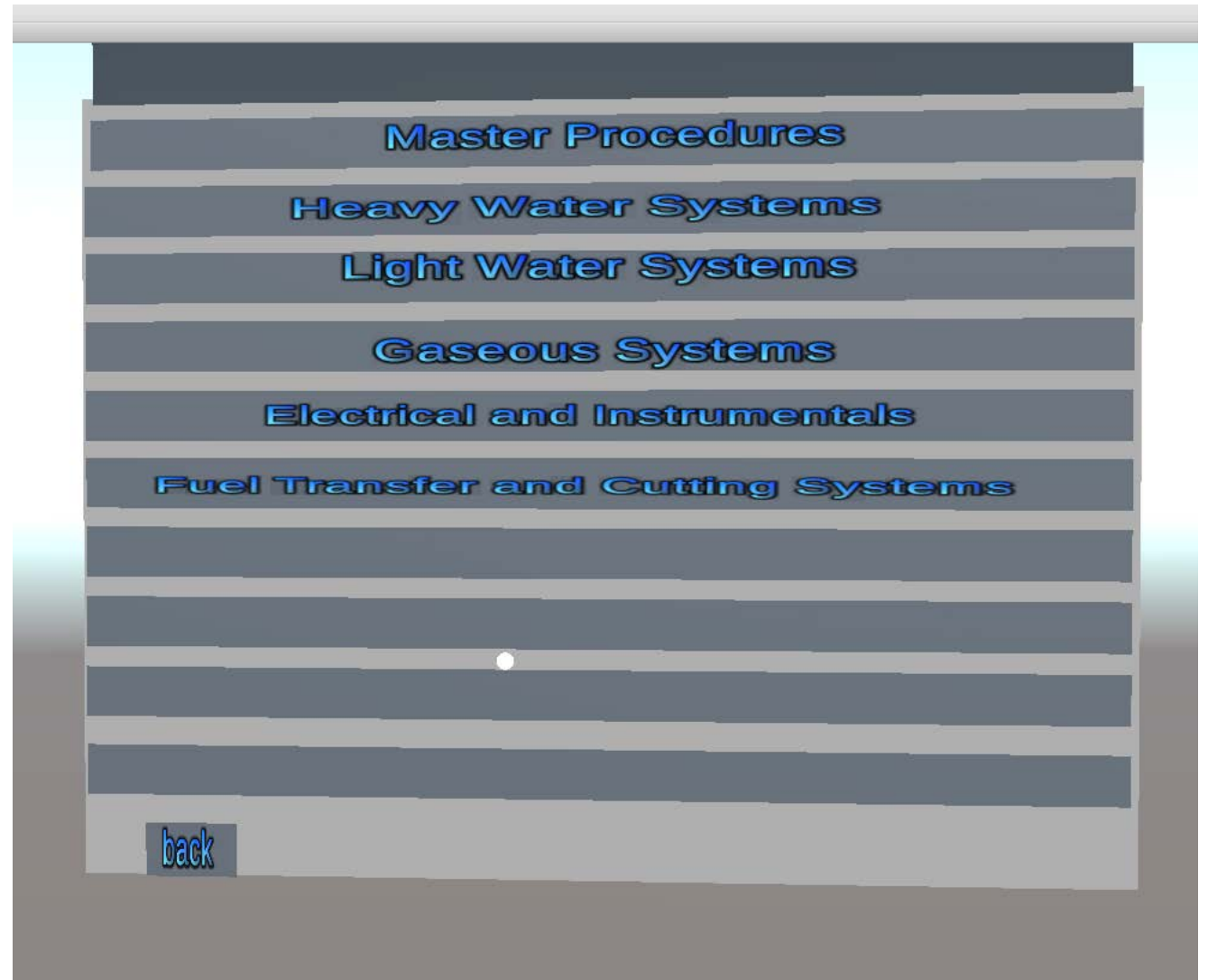
Conclusions

- Environment to conduct HFA
 - Collect timing and accuracy data
 - Support proposed changes
- Train reactor operators



What's Left?

- Add operating procedures
- Collect data
- Aggregate data
- Add options



Disclaimer

Any mention of commercial products within this presentation is for information only; it does not imply recommendation or endorsement by NIST.

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