

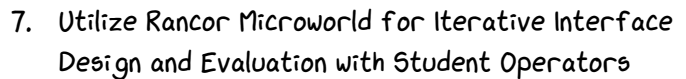
# (How to design and evaluate HMI's for Nuclear Power)

**Acronyms (In order of appearance)**

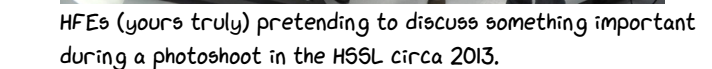
NPP	Nuclear Power Plant
ConOps	Concept of Operations
HMI	Human Machine Interface
UofI	University of Idaho
INL	Idaho National Laboratory
HSSL	Human Systems Simulation Laboratory
HFE	Human Factors Engineer

## 6. Remote User Evaluation w/ Operators

Operators walked through scenarios with a quasi-dynamic HMI over teleconferencing. We validated the basic ConOps and received lots of feedback regarding the interface and engineering design.



8. Implement Refined HMI in INL's HSSL's Full-scope, Full-scale, Reconfigurable Simulator.



9. Conduct Dynamic Scenario Testing w/ Operators

Operators were able to complete normal and abnormal operating procedures but desired increased automation for starting up and shutting down the hybrid energy system.

The diagram illustrates a complex industrial process flow. It features several main units: a CND (Cryogenic Nitrogen Dewar) on the left, an MSH (Main Steam Heater) in the upper left, and a large heat exchanger assembly in the center-right. Numerous streams (represented by blue lines) connect these units, with various control points (XSL-101 to XSL-114) and sensors (T, P, F) indicated. The process involves the flow of materials, likely gases or liquids, through these units and streams. A legend on the right side of the diagram provides a key for the various status indicators and their corresponding colors and symbols.

**Legend:**

- XSL Flow: TF-1001
- XSL Hot Well Level: TF-1004
- XSL Return Temp: TF-1005
- Reboiler Level: TF-2003
- DSL Supply Temp: TF-2005
- XSL Low Pressure
- XSL Vent Activated
- XSL Hotwell Level Low
- XSL Hotwell Level High
- DSL Trip
- DSL-EHX-2 Level Low
- DSL-EHX-2 Level High
- XSL-RB Trip
- DSL Pump Trip
- DSL Reboiler Level Trip
- HTSG Trip



