

HAMMLAB — Halden Man-Machine Laboratory

HAMMLAB is IFE's simulator-based research facility for studying human behaviour and performance in complex operating environments.

We study human-machine interaction and crew collaboration, and integrate the knowledge gained into methods for safety analysis, new designs and support systems. This way we help industries ensure safe and efficient operation.

HAMMLAB serves two main purposes:

1. Enable realistic studies of human behaviour and performance in interaction with complex industrial systems.
2. Provide a realistic environment to develop, test and evaluate prototype control centres and their individual systems.

To fulfil these purposes HAMMLAB utilizes advanced research tools and methods, and flexible simulator technology. To ensure industry relevance we engage professional operating crews in our studies and evaluations.



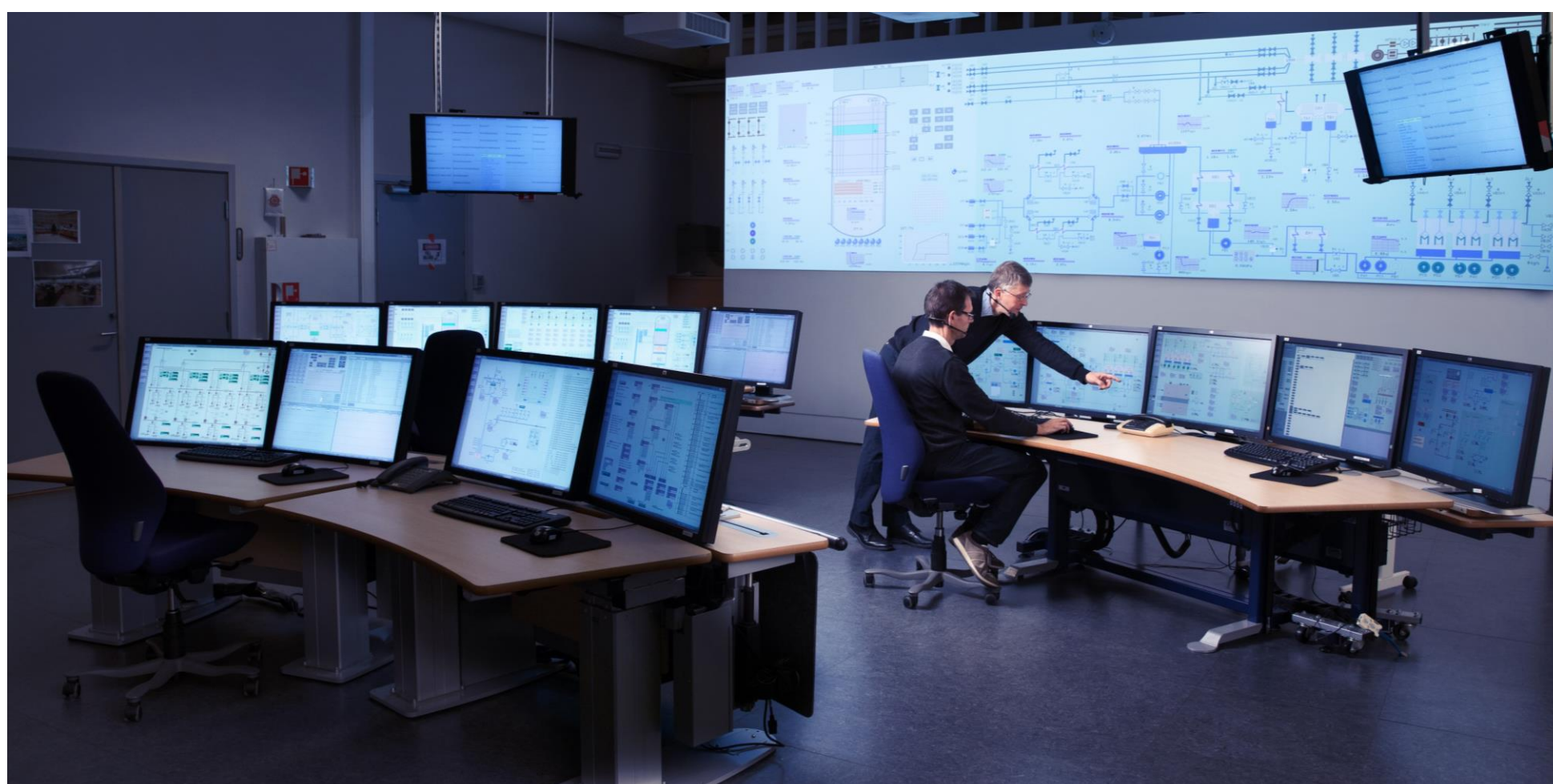
Results from studies performed in HAMMLAB provide new knowledge into basic challenges for individuals and crews. Topics such as the collaboration between automation and humans, teamwork, operating roles, the use of procedures, alarm systems, support systems, and different human-machine interface solutions are studied. This gives input to safety analysis as well as designs and support systems to optimise human performance.

Results are used by instructors, plants, vendors and regulators and as input to national and international standards, guidelines and regulatory frameworks.

FACILITIES

HAMMLAB includes two full-scope nuclear power plant simulators; a control room where professional crews operate the simulated plants; and a gallery from where the experiment team controls the scenarios, observes crew behaviour and evaluates performance.

IFE's Virtual Reality lab is located next to HAMMLAB, enabling studies that include collaboration between control room staff and field operators. Adjacent rooms provide options for studies that include functions external to the control room, e.g. a technical support centre.



COMPETENCES

HAMMLAB's research and development teams are multi-disciplinary and include people with education and experience in power plant operation, interaction design, industrial psychology and computer science.

Subject-matter experts evaluate different dimensions of crew performance. Advanced tools for performance assessment and scenario replay allow for in-depth analysis of operator and crew performance.

PRODUCTS

- ProcSee (<https://ife.no/procsee>): Software to develop and display user interfaces for process monitoring and control
- STEAMS (<https://ife.no/steams>): Software to record and play back simulator sessions, integrating video, audio, screen content, data logs, malfunctions, operator actions and plant responses into a combined stream for post-scenario replay and analysis
- SCORE (<https://ife.no/steams>): Software featuring structured and consistent evaluation of operating crew performance