GAMING SIMULATION BASED TRAINING FOR SST

A simulation developed to train the users of a tokamak in its remote operation,using a robotic arm.

INTRODUCTION

Researchers at Institute for Plasma Research (IPR) are developing the Steady State Superconducting Tokamak (SST) to conduct various experiments on plasma matter. In order to perform maintenance operations for the tokamak, the machine has to be brought to a state where it can be operated on by personnel safely.

This involves shutting down the entire machine for it to cool to a manageable temperature, breaking the vacuum of the plasma chamber and (sometimes) waiting for radiation to reduce. This lengthy procedure is followed by an equally time-consuming process to bring it back into an operating state.

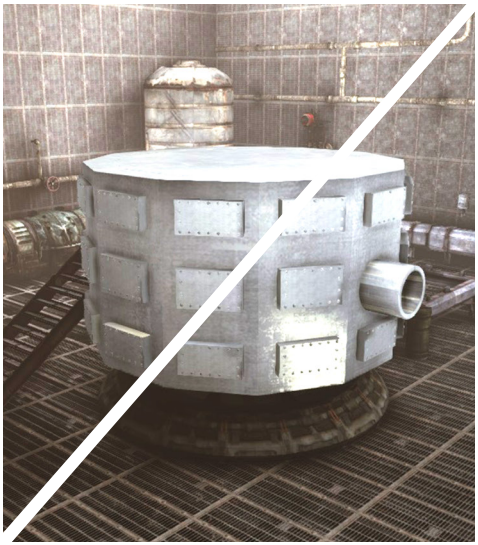
Remote operations for maintenance will reduce the maintenance delays, and allow for longer experiments.

Intended Audience
Operators of the tokamaks

Keywords
SST, training

Type
Virtual Game

Number of players
Single player/ operator



OBJECTIVE

A robotic arm is being designed for performing such remote maintenance operations for SST. We have developed a gaming simulation in order to aid the designers in eliciting requirements for their design, as well as helping train operators to perform maintenance operations.We have done this using an immersive virtual environment completely modelled after the SST.

Equipment and processes in hazardous and highly specialised environments, which require human input, can be designed, developed and tested using such immersive gaming simulations.

Fields of View, #1915, 18th A main, 5th Cross,
J. P. Nagar, 2nd Phase, Bangalore 560078
info@fieldsofview. in | www. fieldsofview. in

GAME PLAY

The interior of the SST is lined with graphite tiles. The player can either be a maintenance operator or a supervisor involved in the design and specifications of the real robotic arm.

The player assumes the role of an SST operator performing maintenance operations through the course of the game, and learns to use the robotic arm to identify and replace damaged tiles. The game is designed in accordance with 4 Component Instructional Design (4C/ID) approach to developing training systems.

It incorporates various levels of difficulty to train operators and monitor their progress as they develop their skill. It also helps supervisors to identify key specifications for the real robotic arm based on the progress of their operators, and on their own experience with the system.

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Collaboration:
Institute for Plasma Research

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