

# Update on the Development of the Control System for the ISIS Robotic Cryogenic Sample Changer

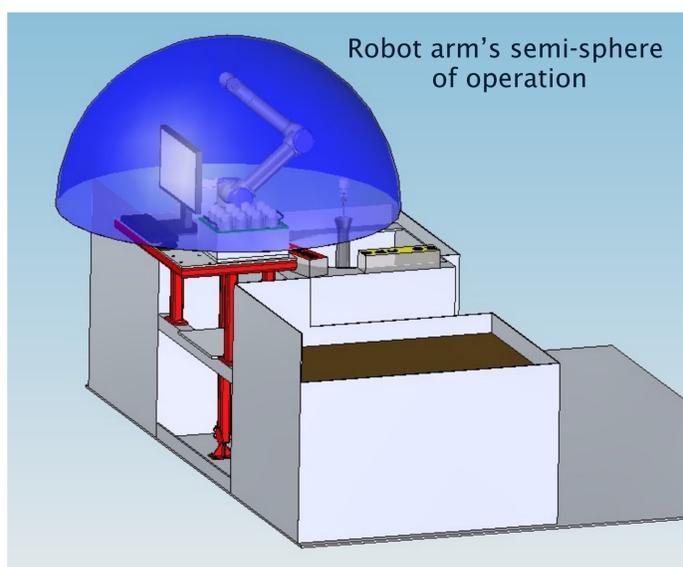
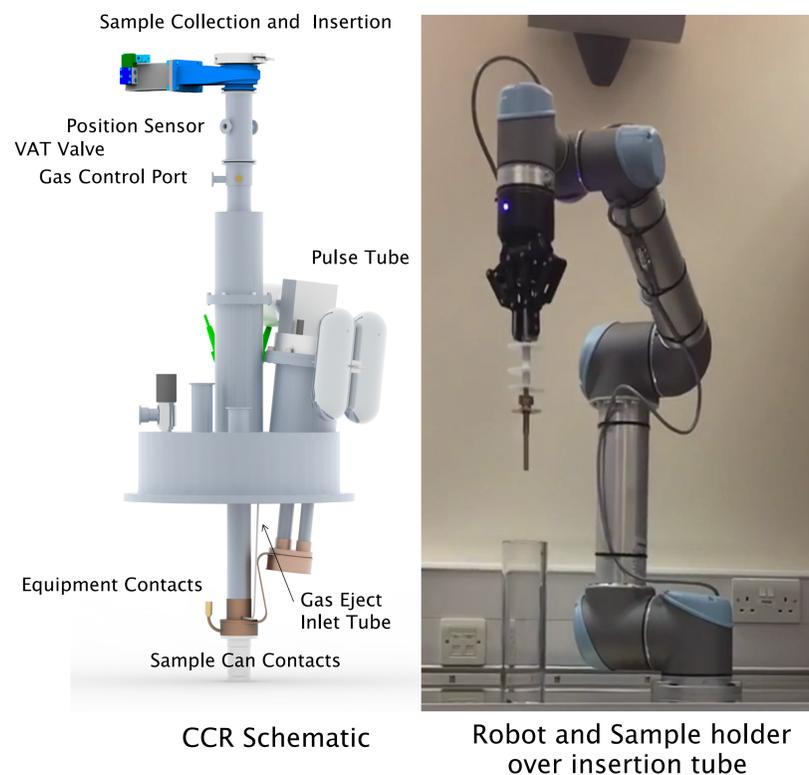
Graham Burgess, Jamie Nutter, Steve Payne, Oleg Kirichuk  
STFC, ISIS, Rutherford Appleton Laboratory, UK

## Project Overview

A commercial robotic system is being employed at ISIS for the first time to perform automated sample changes using a cryostat system

The robot selects the required sample from a tray of 12 samples, and dispenses it down a tube (with automatic valve control) leading to the cryostat. Compressed helium gas is used to retrieve the sample. The robot then returns the sample to the correct tray position.

A supervisor PLC will ensure instrument communications continuity in the event of robot pausing or stopping (collision). The PLC will provide operational status and take-over gas control if required. This PLC also brings SECoP and a support HMI.



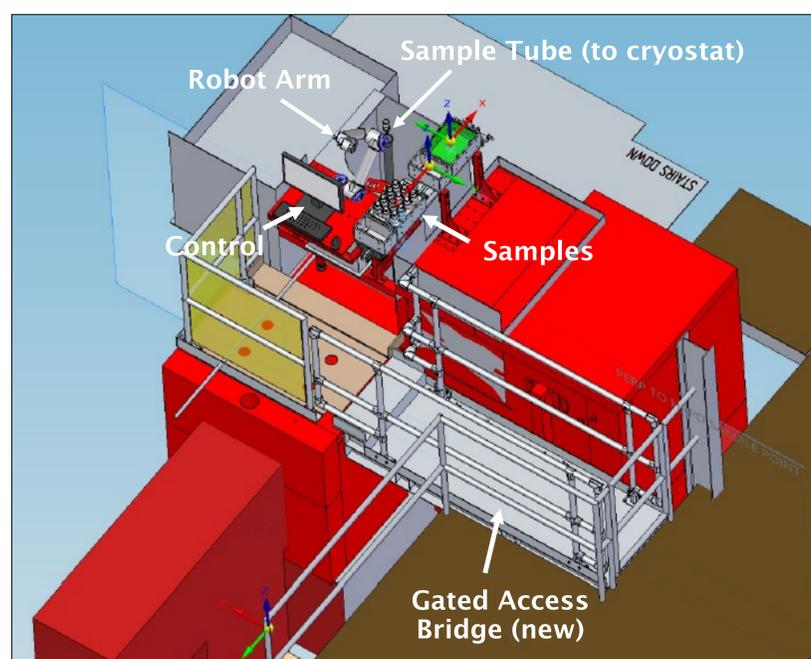
## Safety

Safety in the presence of moving machinery is a major consideration. Knowledge of the robots area of operation is essential - as is the robots speeds and force figures. Safety systems are being designed to prevent an unplanned human - robot interaction. Safety systems include setting up 'safe areas' where the robot's speed is either slowed or the robot is prohibited to travel.

## HRPD and HRPD-X

This first robotic system will be installed on the HRPD instrument (High Resolution Powder Diffractometer) during the long shut down in 2021. The initial commissioning of the system (software and hardware) is being performed in a dedicated motion control lab.

We are also involved in the design of the building upgrade, HRPD-X.....



Robot arm in position