Nuclear reactor control system

System-of-Systems Description

Abstract
This document describes the components and usage of the nuclear reactor control system. The system is comprised of four separate systems which communicate via the core Arrowhead systems using the HTTPS protocol. Together they make it possible to regulate a nuclear reactor by manipulating the control rods based on reactor temperature and pressure.

Contents

1 Overview

This system is designed to regulate a nuclear reactor using control rods, the reactor temperature and the reactor pressure. The 4 different systems in the system-of-systems are the following:

- Temperature provider
  - The temperature provider generates temperature data, and writes the generated value to a csv file. The value is then used to generate the following value. Other systems can fetch the temperature value via the REST endpoint it provides.
- Pressure provider
  - The pressure provider is very similar to the temperature provider, it also generates its own data based on the previous value written, which can be fetched by other systems.
- Control rod provider
  - The control rod provider has an endpoint for fetching a rod insertion percentage value. The provider will fetch the temperature and pressure values of the reactor and use these to calculate a reasonable control rod insertion.
- Reactor consumer
  - The reactor consumer regurarly fetches from the control rod provider to get a control rod insertion percentage. It also subscribes to the events published from the pressure and temperature provider.

For more information of each system, check their respective system description document.

2 Data generation

In the absence of real data, the system will itself generate it's own data, in the form of temperature and pressure. The values generated does not in any way represent real nuclear reactor temperatures or pressure levels, and are completely arbitrary. This is mainly because the focus when building the system was the integration of the different systems and not simulating a valid nuclear environment. If using the system in a real scenario would be an option the need for the value generation would dissapear and be replaced by actual sensors reading the data.

3 Revision History

3.1 Amendments

No.	Date	Version	Subject of Amendments	Author
1				

3.2 Quality Assurance

No.	Date	Version	Approved by
1			