

UNIVERSITY OF FLORIDA

UFTR Digital Control System Upgrade for Education and Training of Engineers and Operators

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Description: The goal of this project is to contribute to a major initiative on design, licensing and construction of a fully digital control system for the University of Florida Training Reactor (UFTR). This makes the UFTR the first operating nuclear power plant in the United States that uses a fully digital control system. This facility will provide for the training and education of the necessary workforce in the area of digital control and instrumentation for nuclear reactors. With this effort, a new focus/certificate on digital control and instrumentation will be developed at the Nuclear and Radiological Engineering (NRE) Department. Further, the UFTR facility will offer training courses for community colleges (Central Florida, Indian River, and Jacksonville) in the State of Florida, personnel from nuclear utilities and government agencies including the Nuclear Regulatory Commission (NRC). The project has already received significant funding from industry and government in form of grants, contracts, equipment/systems, and engineers' time.

Budget: \$308,000

Universities: UF

External Collaborators: Several engineers from AREVA NP Inc & Siemens Corporation

Progress Summary

In order to make the UFTR capable of offering training to engineers and operators, it is necessary to receive approval from NRC on reactor relicensing application and on the Licensing Amendment Request (LAR) for the digital control upgrade. Then install and test the new digital system. Thus far, we have been working on:

- i) Licensing applications (submitted to NRC)
 - a. UFTR Relicensing Application
 - b. LAR for digital protection system
- ii) Basic Design Documentation (submitted/to be submitted to AREVA)
- iii) Application Software Development

i) a. UFTR Relicensing Application

This work was completed and we still are waiting for the license renewal.

i) b. LAR for the digital protection system

We are following the following licensing approach for which we have submitted a modified Final Safety Analysis Report (FSAR) based on NUREG 1537, and referenced various documents related to licensing of a digital protection system. Figure 1 depicts this process:

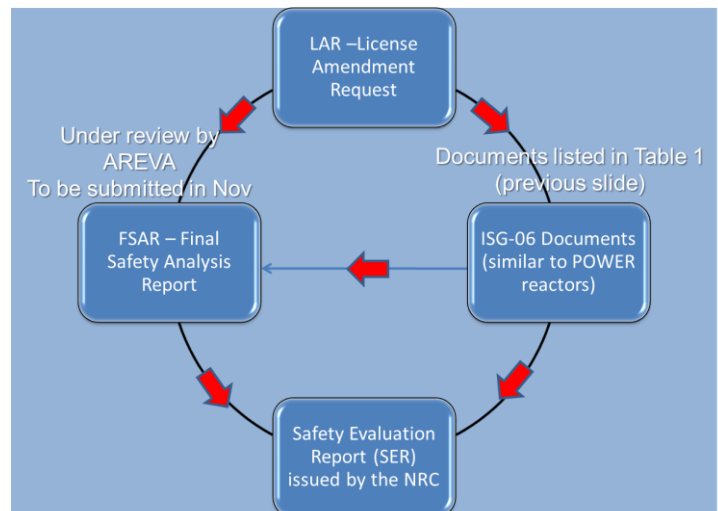


Fig. 1 - New licensing process for the UFTR Digital Control upgrade

Up to now, we have prepared the modified FSAR and completed 20 documents from which 17 documents have been submitted to the NRC.

ii) Basic Design Documentation (submitted/to be submitted to AREVA)

We need to prepare 9 (nine) documents in support of TXS protection system manufacturing in Germany, as part of the Basic Design Documentation. So far, 2 (two) of the documents were submitted to AREVA for review, 2 (two) are in a draft stage and the other 5 (five) are scheduled to be finalized over the Summer.

iii) Application Software Development

We have been working on the *FunBase* and *SPACE* software tools. The former tool is used in support of document preparation, particularly the SRS, and latter tool is used to prepare network diagrams, and eventually the necessary *object* file for operating the TXS system.

Here, currently we are training ourselves and trying to determine the limitations and capabilities of the two tools.