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Author: Mr. Jakub Nalewaj
Wrocław University of Technology, Poland

Mr. Sławomir Małkowski
Wrocław University of Technology, Poland

Ms. Diana Pawlicki
University of Lodz, Poland

LIQUID FLUORIDE THORIUM REACTOR - CURRENT RESEARCH AND CAPABILITIES FOR
MARS AND MOON HUMAN COLONIES.

Abstract

After Fukushima nuclear reactor fault a lot of attention come back to alternatives for Uranium based source of energy. Although, classical Light Water Reactor has no influence on climate change and they have significant power output but they are not fuel efficient, produce weapon grade nuclear waste, they are expensive and long term to build.

A solution for all of this problems is a technology from 50's - concept of using Thorium, much more common element than Uranium, as a fuel source for fission reaction. Few years ago, quietly new race begin - race for clean, efficient and safe thorium based nuclear energy. Race, where not only national laboratories, but a lot of companies from private sector are involved.

During our presentation we would like to describe and analyze few recently published concepts, which are capable of generating hundred Mega Watts of energy in size comparable to a truck, and summarize current state of thorium based energy in general.

In this work student concept of Martian colony is presented. An idea for preparing project in this field was born due to participation in The Mars Society competition – Mars Colony Prize – Design The First Human Settlement On Mars. Rules determine number of settlers as one thousand, what made this project more complicated and difficult in terms of energy consumption for this scale of Mars colony. During this project we conducted a deep research on alternative power sources, which leded us to few important conclusions, which we would like to share and discuss.