

COE-INES – DR-RA International Conference Report

Participant

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Program : Doctoral Program 2nd year
Department : Nuclear Engineering Department
Laboratory : Sekimoto Laboratory

Conference Details

Paper Information

PaperID : ICONE14-89395
Paper Title : Design Feasible Area on Water Cooled Thorium Breeder Reactor In Equilibrium States
Type of presentation : Oral presentation + discussion
Type of paper : Technical publication for paper proceeding

Name of Conference

:
International Conference on Nuclear Engineering 14 (ICONE 14)
<http://www.asmeconferences.org/ICONE14/index.cfm>

Date and place

:
July 17 - 20, 2006, Conference meeting date in Miami, Florida, USA
InterContinental Miami Hotel, Florida, USA

Hotel

Holliday Inn Hotel on July 16-21, 2006. 5 days staying in the hotel.

Research Abstract :

Thorium as supplied fuel has good candidate for fuel material if it is converted into fissile material ^{233}U which shows superior characteristics in the thermal region. The Shippingport reactor used ^{233}U -Th fuel system, and the molten salt breeder reactor (MSBR) project showed that breeding is possible in a thermal spectrum. In the present study, feasibility of water cooled thorium breeder reactor is investigated. The key properties such as flux, η value, criticality and breeding performances are evaluated for different moderator to fuel ratios (MFR) and burn-ups. The results show the feasibility of breeding for different MFR and burn-ups. The required ^{233}U enrichment is about 2% - 9% as charge fuel. The lower MFR and the higher enrichment of ^{233}U are preferable to improve the average burn-up; however the design feasible window is shrunk. This core shows the design feasible window especially in relation to MFR with negative void coefficient.

Program Details:

Name of Program

International Conference on Nuclear Engineering 14 (ICONE 14)

<http://www.asmeconferences.org/ICONE14/index.cfm>

Place of program:

1. International Conference on Nuclear Engineering 14 (ICONE 14)

Place : **InterContinental Miami**, 100 Chopin Plaza Miami, Florida 33131 United States

Tel: 1-305-577-1000 Fax: 1-305-577-0384

2. **ICONE Student Tour** (7:00 AM - 5:00 PM) (St. Lucie Nuclear Plant)

Florida, USA

Activities:

Generally, this event is provided for two big conferences (ICONE 14 and Fluid). This conference is the topical meeting of the ASME (American Society of Mechanical Engineering). The program was divided into 2 big programs such ICONE14 and Fluid, and 1 technical tour for student from 7.00-5.00 PM in the end of conference (July 20, 2006).

The 14-th International Conference on Nuclear Engineering in general

The conference was delivered successfully which was started by the first preliminary session about Nuclear Industry Forum. The chair was Dmitry Paramonov from Westinghouse electric company with several keynote speakers : Dennis Spurgeon - U.S. Assistant Secretary for Nuclear Energy, U.S. Dept. of Energy; Tokio Kanoh - Member of the House of Councilors, Japan; Guojun Huang - Vice President, China National Nuclear Corporation, People's Republic of China; Eduardo Gonzalez Gomez - President Spanish Nuclear Forum and Chairman of FORATOM, Spain. They talk about the present condition of NPP in their countries and then try to shows the NPP planning base on US point of view, Asia (japan and china) perspectives and European Union situation.



Preliminary Session 1 (06/07/17)



Opening Reception (06/07/17)

The progressive NPP planning for the next near future was showed by china's side; they need some big requirement to fulfill the huge demand of energy for the country. The interesting issue is one of the speaker comes from Member of the House of Councilors. He said the important energy source for the future coming from nuclear, he also optimists that for the near future will be constructed more NPP especially in Asia and in the part of developing country which needs more energy for they population.



ICONE Banquet (06/07/18)



Miami Center Intercontinental

Technical Session and Own Presentation

Overall programs are specified by 13 tracking themes and 1 tracking theme for student. The themes were summarized by this following items:

TRK 1 Plant Operations, Maintenance and Life Cycle

TRK 2 Component Reliability and Materials Issues

TRK 3 Structural Integrity

TRK 4 Nuclear Engineering Advances

TRK 5 Next Generation Systems

TRK 6 Safety and Security

TRK 7 Codes, Standards, Licensing and Regulatory Issues

TRK 8 Fuel Cycle and High Level Waste Management

TRK 9 Low Level Waste Management, Decontamination and Decommissioning

TRK 10 Thermal Hydraulics

TRK 11 Computational Fluid Dynamics (CFD), Neutronics Methods and Coupled Codes

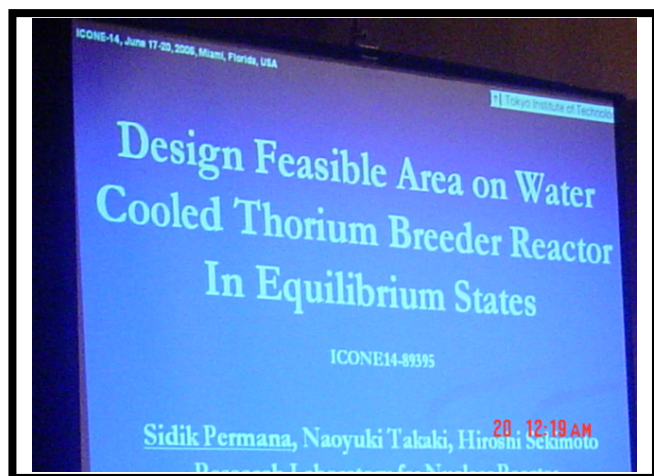
TRK 12 Near Term Deployment and Promotion of Nuclear Energy

TRK 13 Nuclear Industry Forum (Keynote, Plenary, Panel and Poster Sessions)

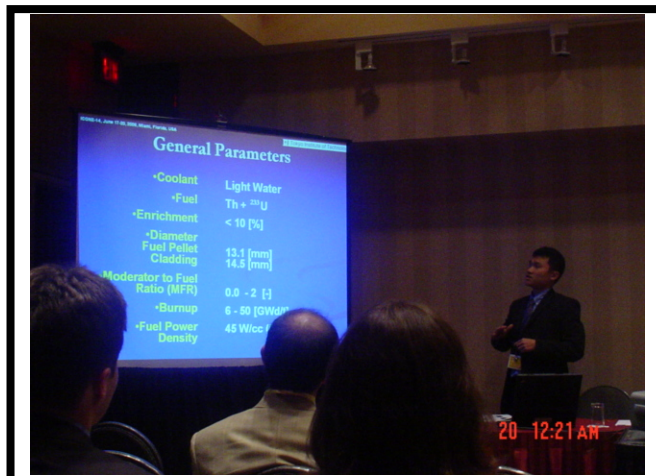
TRK 14 Student Paper Competition

My paper was presented on July 19, 2006 (Wednesday, 10.30 AM-12.30 PM) which was included into TRK 4 as Nuclear Engineering Advances Theme. The TRK 4 was divided into 4 themes, one of the theme is TRK 4-2, it was New Reactor Concepts. In that session, it was nice presentation, however from 6 presenter, only came 2 presenter (me and the other one). My paper was entitled Design Feasible Area of Water Cooled Thorium Breeder Reactor in

Equilibrium State. The paper was presented and published in Proceeding of ICONE-14 as technical publication.



My ICONE-14 Paper and Presentation Title



My Own Presentation (06/07/19)

Exhibits/Sponsorships and Student ICONE Tour

The Conference was cooperating with some sponsors with also gave some interactive presentation or nice showroom to introduce their newest product. The following companies are exhibiting at the joint ICONE 14/Fluids Engineering conference. Please click on the links to get additional information about their products and services.

CD Adapco (<http://www.cd-adapco.com/>)

AREVA (<http://www.areva.com/>)

TSI Incorporated (<http://www.tsi.com/>)

AECL (<http://www.aecl.ca/>)

Climax Portable Machine Tools, Inc. (<http://www.cpmpt.com/>)

Tokyo Electric Power Company (<http://www.tepco.co.jp/en/index-e.html>)

Westinghouse (<http://www.westinghousenuclear.com/>)

TDW Services (<http://www.tdwilliamson.com/>)

Hitachi America, Ltd. (<http://www.hitachi.com/>)

HYTEC (<http://www.hytecinc.com/>)

Idaho National Laboratory (<http://www.inl.gov/>)

Global Nuclear Energy Partnership (<http://www.gnep.energy.gov/>)

The student participant was supported by the sponsor and the association to join with this conference. Two special sessions for student participant are student presentation which was followed by student poster session, and the other student program is the ICONE Student Tour. The tour was held 7:00 AM - 5:00 PM on Thursday July 20, 2006. In this special event, we had opportunity visited the St. Lucie Nuclear Plant, Florida, USA. These facilities not only the reactor operation facilities but also the training center and as a public relation of Nuclear field side to the public.



One of the Exhibitions / Sponsorships

Concluding Remark

The 14th International Conference on Nuclear Engineering (ICONE14) was held in Miami on July 17-20, 2006. All events of the conference were very successful and useful for the next nuclear renaissance, especially for young nuclear engineering generation. Thank you for COE-INES Tokyo Institute of Technology which supported for this interesting conference.



ICONE Student Tour (St. Lucie Nuclear Plant)

Next ICONE-15

The 15th International Conference on Nuclear Engineering (ICONE15) on April 22-26th, 2007 Nagoya Congress Center Nagoya, Japan. See at <http://www.icone15.org/>. See you at ICONE-15 in Nagoya.

